The India Rubber World

VOLUME LXI
October, 1919, to March, 1920

VOLUME LXII
April, 1920, to September, 1920

New York:
THE INDIA RUBBER PUBLISHING CO.
1920

Vol. LXIII — OCTOBER 1, 1920 — No. 1

A

Abrader, Tire, Cordell and Nugent..........*297
Accelerators, Notes on....(*Henry P. Stevens*) 719
  Organic, Effect of, on the Vulcanization Coefficient ....(*Charts*)*137
  Reactions of, During Vulcanization........ 206
  "Velosan" 426
  "Vulcazol" 714
  "Vul-Ko-Cene" 714
"Accident," The Goodyear Vulcanization. (*Editorial*) 633
Accidents in Factories............(*Editorial*) 556
Accumulator, Hydraulic..........*363
"Adheso" Millinery Glue.......... 590
Adjudicated Patents.......... 726
Airplane Gasoline Tanks, Rubber Armor for.*726
Airplanes, Radio Head Set for..........*156
Africa, British, Cotton in..........*494
African Notes 536, 686
Air Bag for Tire Repair, Repairable, "Perpetual" *815
  Improved 659
  Bags, Endless *365
  Compressor, Curtis *430
  Fords Not as Yet..........(*Editorial*) 556
  "Peds" for Heels and Soles..........*434
"Aircraft Year Book, 1920"...(*Book Review*) 588
Akron-Williams Tire Repair Novelties.......*585
Alling, W. S..........(*Obituary—Portrait*)*163
Aluminum Alloy Mold for Rubber Articles...*431
  In the Rubber Industry..........*513
  Latex Cups *115
ALWYN-SCHMIDT, L. W.—
  American Rubber Industry, Effect of Location on Prosperity of..........(*Chart*)*407
  Cost Accounting in Rubber Production. (*Chart*)*342
  Influence of Present Exchange Situation on Competitive Position of American Rubber Industry in Foreign Fields......(*Charts*)*281
  Tire Fabric and Long-Staple Cotton....... 640
"America, For a Better"......(*Book Review*) 438
  Western North, A Rubber Plant Survey of (*Book Review*) 230
American Chemical Society
  Rubber Division Meetings..20, †87, 376, 498, 712
    Dunlop Nearing Completion.......... 822
  Export Practice, Standard.......... 345
  Plantation Rubber ....(*Editorial*) 633
  Rubber Industry, Effect of Location on Prosperity of....(*L. W. Alwyn-Schmidt*)*407
    in Foreign Fields, Influence of Present Exchange Situation on Competitive Position of..(*L. W. Alwyn-Schmidt*)*281
    Plantations in Mexico.........(*Editorial*) 201
    Reserve, An ....(*Editorial*) 202
  Society for Testing Materials, Annual Meeting 596
Amsterdam Rubber Market..119, 258, 393, 466, 542, 618, 695, 772, 847
Antwerp Rubber Arrivals..118, 189, 259, 329, 395, 468, 695, 774
Apprenticeship, Industrial Training and. (*Editorial*) 134
Apron, "Miladi Dainti".......... 95
Arch Support, Pneumatic..........*157
Armor, Rubber, for Airplane Gasoline Tanks..*726
Artics, Making, by Machinery..........*205
Artistic Mold Work......(*Arthur C. Squires*)*816
Asia, Oceania and Africa, Rubber Tariffs of.. 568
Asphalt, German Synthetic........(*Editorial*) 134
Assuring the Crude Rubber Supply..(*Editorial*) 785
Australia, Rubber Trade in..........50, *181
Austria 74, 836
Auto Baby Crib, Gordon.......... *93
  Top Fabric *591
    Vulcanizing and Varnishing Machine....*736
Automatic Lathe for Cutting Rubber Washers.*658
  Mill and Mixer, Banbury..........*735
  Pigment-Weighing Machine *501
  Tire-Building Machine and Loom, Schaeffer.*735
Automobile Accessories *739
  and Gasoline Engine Encyclopedia, Dyke's. (*Book Review*)33, 588
  Fan Belt *737
  Show, National, Twentieth Annual........*304
  Step-Plates or Running-Board Mats...*29, *94, *157, *300, *589, *662
  Top "Allweather" 739
  "Duratop" 591
  "Duxraine" for 155
Automobiles, "Antiglare" for..........*157
Axe, Safety, for the Camper..........*589

B

Babcox, Edward S......(*Portrait and Sketch*) 450
Baby Crib, Auto.......... *93
  Pants, "Jiffy" *157
    "Kewpie" *433
    "Utility Fitwell" *93
Bacon, H. M..........(*Portrait and Sketch*) 41
Bait, Artificial *589
  Fish, Molded Rubber..........*662

*Illustrated.
†A correction.

Balata Belting, Splicing..........*160
  Cultivation ....(*Editorial*) 555
  Industry in the Colony of Surinam........*251
Balloon Fabric, Government Specifications for. (*Charts*) *9
  Stripping Machine, Toy *659
Balloons, Pilot *160
  Toy Bagpipe *662
  Toy, Valves and Squawker Ends for....... 366
Balls, Base, Rubber in.......... 303
  Golf 94, 365, 663, 682
Banbury Mixer, Automatic..........*735
Band Cutting Machine, Rubber..........*430
Bank Deposits for Pay Envelopes, Substituting ....(*Editorial*) 70
Banner Tire-Building Machine; Improved. *735, *813
Barber, Ohio, Columbus; estate.(*Obituary*) 368, 755
Barrel Filler, Automatic..........*156
Batavia Rubber Market....59, 119, 189, 258, 327, 393, 542
Bath Tub, Folding, for Infants..........*663
Bathing Caps *503, *590
  Shoe, Rubber-soled, "Bruxshu"..........*503
Battery Jars, Manufacture of..........*721
  Retainer, Slotted *662
  Separators, Storage, Machine for Making..*502
Bayer, Friedrich..........(*Obituary*) 759
Belawan Crude Rubber Statistics.......... 847
Belgium Rubber News..........49, *835
Belt, Fan, For Ford Cars.......... 663
  Red Rubber Fan..........*365
  "Vulco-Cord" Bias and V..........*737
Belting, Rubber, "Triple Diamond".......... 300
  Skirt, "Gripfast" *225
Bendel, MacD..........(*Obituary*) 592
Benzol Poisoning..........179, 582
Better Rubber Trees..........(*J. P. Romein*) 5
Bias Fabric, Machine for Making..........*363
Bicycle, Return of The..........(*Editorial*) 69
  Tires, Apparatus and Manufacture.........*432
Billiard Accessories of Rubber..........*529
Blades, Duplex Hacksaw.......... 501
Blake, Theodore Whitney........(*Obituary*) 303
Block's Spiral Spring Force Cup.......... *29
Bloomers, Wading, for Children..........*738
Bohning, Ch. C..........(*Obituary*) 838
Bolt and Nut, Safety Interlocking, Stevenson..*363
Borneo, Dutch West, Planting Rubber in. (*J. E. Evans*) 54
Botanical Research in the Tropics, A Fund for 802
Bowser Portable Rubber Cement Tank....... *26
Boxes, Compound Tote, Stacking.......... *26
  Testing Shipping *796
Brake Lining Cutter..........*222
Brazil Rubber Statistics..61, 119, 189, 258, 390, 469, 622, 700, 775, 853
  Notes 53, 84
British Africa, Cotton in..........*494
  Institute of Patentees..........(*Editorial*) 2
  Key Industries To Be Protected.......... 320
  Notes 49, 89, 114
  Standard List of Rubber Tyres for British Standard Rims *570
Brown Bast on Tapped *Hevea*.......... 54
Brush, Hair, and Mirror Pocket..........*503
  with Rubber Cushion..........*590
  Nail and Hand..........*503
Buckleton, Captain, Visits German Rubber Factories ....(*Portrait*) *47
"Bug, Crawling," Tiger Snail of Australia.... 93
Buffer for Inner Tube Patches, Cordell and Nugent *297
Buffing Machine, Rubber..........*734
  Rubber Tiling, for Floors, International.. *67
Bunsen Burner in Rubber Repair. (*Arthur C. Squires*)*513
BURNHAM, CHESTER C.—
  Will Rubber Soles Successfully Replace Leather Soles? *792

C

Cactus Rubber, Experiments with a New. (*Emmet S. Long*)*709
Calculagraph, Time Recorder..........*430
Calculating Machine for Footwear Manufacture, Krippendorf "Kalculator"..........*362
Calender Drive, Herringbone Reducing Gear..*152
  Electrically Driven, with Safety Device.... *90
  Shells, Wooden *152
Calipers, Indicating *431
Canada Rubber Statistics...62, 128, 195, 264, 333, 397, 472, 549, 626, 700, 852
Canadian Notes..37, 112, 245, 318, 383, *454, 528, 598, 688, 758
  "Trade Index, 1920-1921"....(*Book Review*) 666
Cape, Waterproof, English Rain.......... *93
Caps, Bathing *503, *590
Carbon Black 809
Carlisle Cord Tire Apparatus..........*814
Carlton, Frank Tyler ....(*Obituary*) 592
Carpet Washer with Rubber Brushes, Hamilton Beach *739
Cary, Charles H. ....(*Obituary*) 163
CARY, JAMES WRIGHT—
  Job Analysis and Written Standard Practice 78

  Rubber Factory Foremanship 145
Cassirer, Dr. Hugo ....(*Obituary*) 838
Cement Churn "Eimco" *90
    Vertical *221
  Container and Dispenser, McNutt......... *91
  "Kwikfix," Rubber 300
  Rubber, Machine for Applying *153
  Tank, Portable Rubber, Bowser *26
Census for Safety, A..........(*Editorial*) 404
"Ceylon Chamber of Commerce, Report of, for the Year, 1919"........(*Book Review*) 588
  "Rubber Planter's Manual"..(*Book Review*) 370
  Situation 841
  Statistics..59, 119, 189, 391, 469, 542, 618, 695, 772, 847
Champion Tire-Building Stands *584
Chemical Dictionary, "Condensed" (*Book Review*) 97
  Directory of the United States, Annual, (*Book Review*) 33
  Industries, Fifth and Sixth National Expositions of 45, 795
  Names, Simplified ....(*Editorial*) 1
  Patents..24, 86, 150, 220, 291, 361, 428, 497, 583, 656, 730, 811
    Other 151, 220, 291
  Society, American, Rubber Division Meetings ....20, †87, 712
  "Synonyms, Inorganic, and Other Useful Data" ....(*Book Review*) 508
Chemicals and Compounding Ingredients, Market for..66, 130, 197, 266, 334, 400, 476, 552, 630, 703, 781, 859
Chemistry, Colloidal Viewpoint of Rubber (*Ellwood B. Spear*) 809
  "Industrial" ....(*Book Review*) 508
"Chemists, A German-English Dictionary For" (*Book Review*) 820
  Rubber, What They are Doing..22, 85, 149, 218, 289, 359, 427, 495, 581, 654, 730, 809
Chicle, Chewing ....(*Editorial*) 270
China, French Indo 838
  Yearns for Rubber Factories ..(*Editorial*) 70
Christie, John T.......(*Portrait and Sketch*) 409
Chrysil Rubber, Three Hundred Million Pounds of *203
Chucks, Magnetic *501
Clark Flexible Coupling *363
Clean Rubber at the Source......(*Editorial*) 403
Clicking Machines, Improved *500
Clothes Sprinkler *30
CLOTHING—
  British Motorcycle Waterproof.......... 224
  Raincoat, Practical *30
  Showerproof Riding Coat *30
  White Rubber Coat *30
Clutch and Gear, Friction, Plamondon.......*502
Coagulation of *Hevea* Latex......(*G. Vernet*) 24
Coal Handling Conveyor *297
Coat, British Army Waterproof.......... 817
  Motorcycle, Waterproof 224
  Riding, Showerproof *30
  White Rubber *30
Coating, Machine for, Inside Casings........*585
Coil Box Protectors *590
Cole, Dr. Charles K..........(*Obituary*) 438
Colloidal Viewpoint of Rubber Chemistry (*Ellwood B. Spear*) 809
COLT, COLONEL SAMUEL P.—
  Production, Not Selling, Is The Problem.. 344
Combs, Rubber, War Department Specifications for *725
Coming Rubber Shortage, The....(*Editorial*)*707
"Commercial Register of the United States for Buyers and Sellers, Hendricks'" (*Book Review*) 370
Commissioner of Patents, Decision.......... 10
Compound Boxes, Stacking *26
Compounding Ingredient, Sweet Wax........ 655
  Scale, Special *658
Compressor, Air, Oil-Proof, Curtis..........*430
Condamine, The Popularist of India Rubber (*Portrait*)*371
Condensed Chemical Dictionary (*Book Review*) 97
Congo Rubber A Big Asset of Belgium (*S. P. Verner*)*182
Container, Rubber Cement *91
Controller, Steam Pressure, Automatic for Gas-Heated Machines *27
  Temperature, Vulcanizer, Honeco *586
Conveyor, Coal Handling *297
Cooling and Drying Racks *297
Copy Holders, "Line-a-Time" *94
Cord Covering and Cord Fabric Machine....*364
  Electric, Portable, "Duracord"..........*299
  Tire Apparatus, Carlisle *814
  Builder, Banner; Improved *735, *813
  Tires, Giant, for Motor Trucks..........*143
Core Remover, Tire, Sectional *222
Correspondence..10, 74, 148, 230, 301, 372, 436, 507, 579, 666, 740, 820
  Domestic..35, *105, 167, 234, 305, 373, 441, 515, 595, 669, 745, 821
Cost Accounting and Cost Equipment in Rubber Production....(*L. W. Alwyn-Schmidt*)*342

Sheet Rubber, Dial Gage for.................. *733
Solderless Terminals *497
Spark, Metallic, Safety Gas Lighter.......... *429
Specific Gravity Chainomatic Balance........ *812
Spoon, Combustion and Deflagration.......... *87
Still, Water, Aluminum......................... *220
Stop-Cock, Pressure-Equalizing *151
Support, Funnel, Aluminum.................... *597
Tube, and Monochromatic Flame Attachment *812
Terminals, Solderless, "Meliorite"........... *497
Testing Fineness and Texture of Pigments 812
Testing Machine, Fabric, Autographic...... *583
Thread-Counting Micrometer *291
Titration of Oil for Acidity, Pipette Used in *361
Tube, Combustion, Electrically Heated...... *361
Sedimentation, Imhoff *151
Valve, Safety, for Distilling Flask......... *291
Viscosity of Rubber, Apparatus for Determining *497
Vitreosil Beakers *656
Wash-Bottle, Wicker-Wound *656
Water Still, Aluminum........................ *220
Weighing Dish, Standardized, Laboratory.. *733
Wicker-Wound Wash-Bottle *656
Yarn Number and Weight, Quadrant for Determining *361
Lafayette Precision Tool Grinder............ *814
Ladder Grip *299
Stay, Vacuum Cup............................ *591
"La France" Detachable Vacuum Cleaner.... *225
Latex Cups, Aluminum........................ *115
Lathe, Cutting, Automatic Washer........... *658
Polishing 26
Lead-Encasing Hose Press, Hydraulic........ *657
Leather Rubber Footwear.......... (*Editorial*) 708
Leavitt, P. W........................ (*Portrait*) *108
"Lectroflator" Tire Inflator.................. *27
Letter Opener, "Lightning".................. *225
Letters, Interesting, from Our Readers..... 10, 74, 148, 230, 301, 372, 436, 507, 579, 666, 740, 820
Lewis Solvent Recovery System.............. 584
Life-Saving Garment, Pneumatic............. *366
Suit, Rubberized *93
"Lightning" Letter Opener *225
"Line-a-Time" Copy Holder.................. *94
Linemen's Protectors *93, 682
Litchfield, Paul W..... (*Portrait and Sketch*) *827
"Loadometer," Truck Load Meter............ *737
"Locktite" Patcher, "Auto-New-Matic"....... *738
Loggie, George R....... (*Portrait and Sketch*) *519
LONG, EMMET S.—
Experiments with a New Cactus Rubber.... *709
Looking Ahead in Rubber.......... (*Editorial*) 202
Loom and Tire-Building Machine, Combined, Schaeffer *735
Los Angeles Challenges Akron (*Frederic North Shorey*) *158
Luders, Charles Frederick (*Obituary—Portrait*) *439

Mc

McAneny, L. .... (*Portrait and Sketch*) 313
McClaren, H. L. .... (*Portrait*) *37
McGraw, Edwin C. ...... (*Obituary—Portrait*) 666
McMahan, William J.... (*Portrait and Sketch*) 382

M

Macbean, Edward .... (*Obituary*) 7
Machinery Has Done for Rubbber, What (*Editorial*) 479
Rubber, Triumphs (*Editorial*) 269
MACHINERY PATENTS, OTHER..28, 92, 154, 223, 298, 364, 432, 502, 587, 659, 736, 815
MACHINES, MILL APPLIANCES, AND DEVICES—
Abrader, Tire, Cordell and Nugent...... *297
Accumulator, Hydraulic *363
Air Bag, Repairable, "Perpetual".......... *815
Compressor, Curtis *430
Akron-Williams Tire Repair Novelties.... *585
Automatic Lathe for Cutting Rubber Washers *658
Mill and Mixer, Banbury *735
Pigment-Weighing Machine *501
Tire-Building Machine and Loom, Schaeffer *735
Banbury Mixer, Automatic *735
Band Cutting Machine, Rubber............ *430
Banner Tire-Building Machine, Improved... *813
Bias Fabric, Machine for Making........... *363
Bicycle Tire Press, Hydraulic.............. *152
Blades, Duplex Hacksaw 501
Bolt and Nut, Safety Interlocking, Stevenson *363
Boxes, Compound Tote, Stacking........... *26
Brake Lining Cutter *222
Buffer for Inner Tube Patches, Cordell and Nugent *297
Buffing Machine, Rubber *734
Calculagraph, Time Recorder *430
Calculating Machine to Avoid Fabric Waste in Footwear Manufacture, Krippendorf "Kalculator" *362
Calender Drive, Herringbone Reducing Gear *152
Electrically Driven, with Safety Device.. *90
Shells, Wooden *152
Calipers, Indicating *431
Casings, Coating Inside of, Machine for.. *585
Cement Churn, "Eimco" *90
Vertical *221
Container and Dispenser, McNutt...... *91
Tank, Portable Rubber, Bowser.......... *26
Champion Tire-Building Stands *584
Chucks, Magnetic *501
Clark Flexible Coupling *363
Clicking Machine *500
Clutch and Gear, Plamondon *502
Coal Handling Conveyors *297
Coating Machine for Inside of Casings.... *585
Compound Boxes, Stacking *26
Compressor, Air, Oil-Proof, Curtis......... *430
Controller, Steam Pressure, Automatic for Gas-Heated Machines *27
Vulcanizer Temperature, Honeco......... *586
Cooling and Drying Racks *297
Conveyor, Coal Handling *297
Core Remover, Tire, Sectional *222
Coupling, Flexible, for Mill Lines........ *363
Cracker or Crusher, Mineral Rubber, Day "Hercules" *431
Crane, Solid Tire Press *657
Curtis Air Compressor, Oil-Proof.......... *430
Cutter, Brake Lining *222
Cutting Machines for Pressed On Truck Tires *221
Rubber Bands *430
Washers, Automatic *658
Sheet Stock for Small Molded Goods.. *814
Day "Hercules" Mineral Rubber Cracker.. *431
Disk Type Clutch and Gear, Plamondon.... *502
Drive, Herringbone Reducing Gear, for Calender *152
Drying and Cooling Racks *297
Duplex Hack-Saw Blades, Peerless *501
"Eimco" Cement Churn *90
Mixer *500
Electric Space Heater *153
Electrically Driven Calender and Mixer.... *90
Elevator, Portable, or Piling Machine.... *501
Fabric, Bias, Machine for Making......... *363
Cleaning, Machine for *812
Testing Machines *563, *652
Vulcanizing and Varnishing Machine, Auto Top *736
Waste in Footwear Manufacture, Krippendorf "Kalculator" to Avoid *362
Factory Signal, "Klaxocator".............. *152
Footwear Manufacture, Krippendorf "Kalculator" to Avoid Fabric Waste in..... *362
Friction Clutch and Gear, Disk Type, Plamondon *502
Gage, Pocket Rubber Thickness *297
Grinder, Ball-Bearing, and Polishing Lathe. *26
Hack-Saw Blades, Peerless Duplex *501
Heater, Space, Electric *153
Heating, Ilgair Unit System of............ *222
"Hercules" Mineral Rubber Cracker, Day. *431
Herman Tire-Building Machine *430
Honeco Vulcanizer Temperature Controller. *586
Hose Press, Lead-Encasing, Hydraulic..... *657
Hydraulic Accumulator System *363
Lead-Encasing Press for Rubber Hose.. *657
Ilgair Unit System of Heating.............. *222
Inflating Apparatus for Tires, "Lectroflater" *27
Inner Tube Mandrel, Circular............. *153
Valve Nut Tightener *586
Inspecting Machine, Tire Casing........... *658
Interlocking Nut and Bolt, Safety, Stevenson *363
"Kalculator," Krippendorf, for Avoiding Waste of Fabric in Footwear Manufacture. *362
"Klaxocator," Novel Factory Signal......... *152
Krippendorf "Kalculator" for Avoiding Waste of Fabric in Footwear Manufacture. *362
Lafayette Precision Tool Grinder........... *814
Lathe, Cutting, Automatic Washer.......... *658
Polishing, and Ball-Bearing Grinder.... *26
Lead-Encasing Hose Press, Hydraulic...... *657
"Lectroflator" Tire Inflator *27
Lewis Solvent Recovery System *584
Loom and Tire-Building Machine Combined, Schaeffer *735
Magnetic Chucks *501
Mandrel, Circular for Curling Inner Tubes. *153
Mathern Tire-Building Machine *584
Mill, Individual Motor-Driven *26
Mineral Rubber Cracker or Crusher, Day "Hercules" *431
Mixer, Banbury, Automatic *735
"Eimco" *500
Electrically Driven, with Safety Device.. *90
Rubber Solution and Cement, "Eimco".. *90
Solution, Triplex *657
Vertical Cement *221
Mold, Retread, and Sectional Vulcanizer.. *814
Molded Goods, Small, Sheet Stock Cutter for *814
Molds, Tire, Flexible Steel *586
Motion Study Stop-Watch.................. *660
Nut and Bolt, Safety Interlocking, Stevenson *363
Oil-Proof Air Compressor, Curtis.......... *430
Peeler, Roller and Applier for Tire Treads. *296
"Perpetual" Repairable Air-Bag *815
Piling Machine or Revolvator *501
Plamondon Clutch and Gear................ *502
Portable Elevator or Piling Machine, "Revolvator" *501
Precision Tool Grinder, Lafayette *814
Press, Hose, Lead-Encasing, Hydraulic.... *657
Hydraulic, Rodless Vulcanizing........... *91
Tire, Solid, Crane for..................... *657
Pulley Tread, "Pulmore".................... 783
"Pulmore" Pulley Tread 783
Racks, Cooling and Drying.................. *297
Retreader, Tire, High Pressure............ *296
Revolvator or Piling Machine............... *30
Rubber-Band Cutting Machine *430
S. & B. Flexible Steel Tire Molds.......... *586
Safety Devices on Electrically Driven Calender and Mixers *90
Interlocking Nut and Bolt, Stevenson... *363
Motor Starters *362
Sandstones for Rubber Workers............ *298
Scales for Auto Tires and Tubes........... *27
Rubber Compounding *658
Sectional Vulcanizer and Retread Mold.. *814
High Pressure *586
Sheet Stock Cutter for Small Molded Goods. *814
Signal, Novel, for Factory, "Klaxocator".. *152
Solution Mixer, Triplex *657
Solvent Recovery System, Lewis.......... *584
Storage System, Rubber *658
Stacking Tote Boxes *26
Starters, Safety Motor *362
Steel Tire Molds, Flexible, S. & B.......... *586
Stop-Watch, Motion Study *660
Stranding Machine, Two-Head, Vertical... *91
Syringe, Fountain, Trimming Machine.... *296
Tank, Portable, for Rubber Cement, Bowser *26
Temperature Controller for Vulcanizer, Honeco *586
Testing Machine, Tire, Motor Driven..... *296
Machines, Fabric *652
Recent Improvements in.................. *563
Thermometers, Recording, for Rubber Vulcanizers *221
Time Recorder, Calculagraph *430
Tire Buffing Stand *26
Builder, Banner, Improved *813
Building Fabric *222
Machine and Loom, Schaeffer........ *735
Herman *430
Automatic Cord *734
Mathern *584
Stands *585
Casing Inspecting Machine *658
Casings, Worn, Repaired 659
Core Remover *222
Cutting Machine, Solid.................... *221
Fabric Cleaning Machine *813
Impregnator *92, *431
Inflator, Oil-Proof, Curtis *430
Portable, "Lectroflater" *27
Lining Machine *585
Molds, Flexible Steel, S. & B............. *586
Press Cranes *657
Hydraulic Bicycle *152
Tire Repair Mold and Vulcanizer, Pacific. *814
Novelties *585
Retreader, High Pressure *296
Rim, Demountable *222
Testing Machine, Motor-Driven *296
Tread Roller, Peeler and Applier....... *296
Truck, Pressed on Machine for Cutting. *220
Tube Patch Buffers, Cordell and Nugent. *297
Scale *27
Vulcanizer *813
Tool Grinder, Lafayette Precision, Universal *814
Tote Boxes, Stacking *26
Tread Roller, Peeler and Applier.......... *296
Trimming Machine for Fountain Syringe and Water Bottle.......................... *296
Triplex Solution Mixer *657
Valve Nut Tightener, Inner Tube.......... *586
Varnishing and Vulcanizing Auto Top Fabrics, Machine for...................... *736
Vulcanizer, High Pressure, Sectional *586
Recording Thermometer for............. *221
Retread Mold and Sectional, Pacific..... *814
Spot, for Factory Damaged Rubber Goods. *813
Temperature Controller, Honeco *586
Vulcanizing and Varnishing Auto Top Fabrics, Machine for...................... *736
Press, Rodless Hydraulic *91
Washers, Cutting Machine for Rubber.... *658
Water Bottle and Fountain Syringe Trimming Machine *296
Weighing Machine, Pigment, Automatic.... *501
Wooden Calender Shells *152
MACHINERY PATENTS—
Air Bag, Improved 659
Aluminum Alloy Mold for Rubber Articles. *431
Balloon Stripping Machine, Toy........... *659
Battery Separators, Storage, Machine for Making *502
Bicycle Tires, Apparatus and Manufacture. *432
Cement, Rubber, Machine for Applying.... *153
Cord Covering and Cord Fabric Machine.... *364
Covering and Fabric Machine, Cord........ *364
Dipped Goods, Stripping from Curing Forms. *659
Drive for Rubber Mills with Variable Speed 659
Fabric, Cord, and Cord Covering Machine. *364
Tire, Impregnating *431
Felt, Waterproof, Apparatus for Producing. *298
Footwear Vulcanizer, Pressure Cure........ *28
Half-Sole, Applying to Worn Tire Casing. *659
Hose Making Machine *364
Impregnating Felt, Apparatus for.......... *298
Tire Fabric, Apparatus for *431
Machine for *92
Inner Tubes, Machine for Making.......... *587
Mandrel for Inner Tubes *587
Mold for Rubber Articles, Aluminum Alloy. *431
Repair-Tire, Applying to Worn Casings.... 659
Separators, Storage Battery, Machine for Making *502
Slicing Machine, Tire Tread, Pneumatic.. *223
Splitting Extruded Double Solid Tires, Machine for *92
Storage Battery Separators, Machine for Making *502
Stripping Dipped Goods from Curing Forms. *659
Tire, Bicycle, Apparatus and Manufacture. *432
Builder, Cord or Fabric, Banner.......... *735
Solid *27
Double Solid, Machine for Splitting Extruded *92
Repair by Applying Half-Sole Repair-Tire to Worn Casing 659
Solid, Double, Splitting Machine......... *92
Splitting Machine, Solid, Double......... *92
Tread Slicing Machine, Pneumatic...... *223
Toy Balloon Stripping Machine............ *659
Vulcanizer, Footwear, Pressure-Cure *28
Magnetic Chucks *501
Maguire, John W..................... (*Portrait*) *39
Malaya Rubber Statistics.................. 59, 119, 842
Managers, Selecting Service.. (*A. B. French*) 294
Mandrel for Tire Tubes...................... *587
Mandrels, Circular, for Curing Inner Tubes. *153
"Man-Heil" Automatic Inhaler............... *224
Market, Amsterdam Rubber.... 119, 258, 393, 466, 542, 618, 695, 772, 847
Antwerp Rubber ... 118, 258, 326, 393, 466, 542, 618, 695, 847
Batavia Rubber.. 59, 119, 189, 258, 327, 393, 542

*Illustrated

Chemicals and Compounding Ingredients.....66, 130, 197, 266, 334, 400, 476, 552, 630, 703, 781, 859
Cotton Fabrics..64, 128, 196, 264, 332, 398, 473, 550, 628, 702, 780, 858
Crude Rubber...58, 118, 188, 257, 325, 389, 392, 465, 541, 617, 694, 771, 846
German Rubber 180
Prices, Highest and Lowest....58, 118, 188, 257 326, 391, 465, 541, 618, 695, 772, 847
Reclaimed Rubber...59, 118, 188, 257, 326, 392, 465, 541, 617, 694, 771, 847
Rubber Scrap...64, 128, 196, 264, 326, 398, 473, 550, 628, 702, 780, 858
Singapore Rubber Auctions...59, 119, 189, 258, 327, 393, 466, 695, 772, 847
Martin Super Cord and "Mono" Cord Tires...*224
Mask, Gas or Smoke, "Gasco" *504
Massachusetts Rubber Trade....38, 106, 175, 238, *311, 377, 447, 523, 600, 675, 750, *825
Mason Truck Cord Tire *224
Mat for Automobile Step or Running Board *29, *94, *157, *300, *589, *662
Marbled or White, "La-Tite" 794
Semi-Circular, Barber or Dental Chair, "Circomat" *663
Soda Fountain 591
Mathern Tire-Building Machine *584
Mauthe, Frank G....... (*Portrait and Sketch*) *672
Maxwell Ladder Stay *591
Mayberry, Alec J....... (*Obituary—Portrait*) *438
Mayl, Joseph E. ...... (*Portrait and Sketch*) *516
Mayrowitz Detachable Interchangeable Heel...*433
Mechanical Rubber Goods, War Department Specifications for 214, 649, 805
"Merchant" Fountain Pen Writing Set *95
"Mermaid" Hair Brush 820
Meter for Measuring Truck Loads, "Loadometer" *737
"Metric Fallacy, The" .... (*Book Review*) 508
Menace, The .... (*Editorial*) 479
System Applied to the Rubber Industry, The (*C. C. Stutz*) *481
Mexico, America Rubber Plantations in (*Editorial*) 201
Pará Rubber in .... (*J. L. Hermessen*) *249
Rubber in the State of Vera Cruz 55
Mexican Riddle, The .... (*Editorial*) 1
Midgley, Thomas...... (*Portrait and Sketch*) *676
Mid-West Rubber Manufacturers' Association *244, 316, 382, *453, 526, 604, 679, 751, *829, 830
Mid-Western Notes....41, 110, 173, 241, 382, 451, *526, 604, *679, *751, 830
"Miladi Dainti" Apron 95
Mill, Motor Driven *26
Millinery Glue, "Adheso" *590
Mills, Rubber, Water Requirements for (*Walter J. Bitterlich*) 791
Mineral Rubber Cracker or Crusher, Day "Hercules" *431
Minor Editorials..2, 70, 338, 404, 480, 556, 634, 708, 786
Miscellaneous Patents—
Demountable Rim for Solid Tires *222
Elastic Fabric for Tire Building *222
Tire, Elastic Fabric for Building *222
Solid, Demountable Rim for *222
Tubes, Inner, Machine for Making *587
Mandrel for *587
Mixer, Banbury, Automatic *735
Cement, Vertical *221
"Eimco" *500
Rubber Solution and Cement, Electrically Driven, with Safety Device *90
"Triplex" *657
Cape, Waterproof, English Rain *93
Mixers and Calender, Electrically Driven *90
Miyagawa, Y.......... (*Portrait and Sketch*) *248
Mold, Aluminum Alloy for Rubber Articles...*431
Retread, and Sectional Vulcanizer *814
Work, Artistic .... (*Arthur C. Squires*) *816
Flexible Steel Tire *586
Molded Goods, Small Sheet Stock Cutter for .*814
"Mono" Cord Tire, Martin *224
"Monotwin" Solid Tire *861
Monroe, Robert I. .... (*Obituary*) 666
More Free Ports Needed .... (*Editorial*) 69
Morehead, H. J. .... (*Portrait*) *104
Motion Pictures, Educational 57
Study Stop-Watch *660
"Motomat" Automobile Running Board Mat..*662
Motor and Accessory Manufacturers' Association
Convention 50
Meetings and Banquet 288
Truck Efficiency as Related to Solid and Pneumatic Tires .... (*S. V. Norton*) *564
Motorcycle Coat, British 224
Pedal Rubber, "Vitalic" *300
Moving Pictures, Rubber Creations for *486
Moynihan, Owen...... (*Portrait and Sketch*) *239
Mullikin Overshoe Tire *589
Murphy, Michael F. .... (*Obituary*) 439

N

Nail and Hand Brush *503
National Association of Waste Material Dealers 660
Rubber Scrap Division Meetings 33
Scrap Rubber Classification 804
Automobile Show, Twentieth Annual *304
Expositions of Chemical Industries, Fifth and Sixth 45, 795
Safety Council, Rubber Section 788
Neidner, Mrs. Augusta .... (*Obituary*) 228
Netherland Indies Notes 686
Netherlands, Rubber and Cotton Trade of.. 610
New Goods and Specialties—
Accelerator Heel Plate, Stanwood 300
Rest, "Essex" *682
Achilles "Butterfly" and "Reindeer" Tires. *662
"Adheso" Millinery Glue 590
"Aero" Inner Tire *95
Air Bag, Endless, Firestone *365
"Air Container" Inner Tire *94
Hose, "Fle-x-Met" *155
"Peds" for Heels and Soles *434
Airplane Radio Head Set with Rubber Ear Caps *156
"Allweather" Automobile Top 739
Apron, "Miladi Dainti" 95
Arch Support, Pneumatic, Boone *157
Armored Pneumatic Tire, Ludington 503
Army Waterproof, New British 817
Asbestos Brake Lining and Clutch Facing.. 729
Sheet Packing, "Tenax" *646
Athletic Shoes, "Wisco" *738
"Auto Antiglare" for Automobile Windshields *157
Baby Crib, Gordon *93
"New-Matic" Inner Tube Patcher, "Locktite" *738
Top Fabric 155, 591
Automobile Accessories *739
Fan Belts *365, 663, *737
Mats....*29, *94, *157, *300, *589, *662
Top, "Allweather" 739
"Duxrane" For 155
Axe, Safety for the Camper *589
B. & D. "Loadometer" *737
Baby Pants, "Jiffy" *157
"Kewpie" *433
"Utility Fitwell" *93
Bagpipe, "Eagle Brand" *662
Baits, Artificial *589, *662
Ball, Collapsible (British Patent) 789
Golf 94, 365, 663
Renewer, "Jiffy" *156
Tennis, "Trufite" 682
Bands, Rubber 434
Barber Chairs, "Circomat" for *663
Barrel Filler, Automatic, "United" *156
Basket Ball Shoe, "Wisco" *738
Bath Tub, Folding, for Infants 663
Bathing Caps *503, *590
Shoe, Rubbersoled, "Bruxshu" *503
Battery Retainer, Slotted, "Philco" *662
"Beautifier" Sanitary Hair Brush *590
Belting, Composite 799
Rubber, "Triple Diamond" 300
Skirt, "Gripfast" *225
Belts, Fan *365, 663, *737
Men's "Flexyde" for 752
Bergougnan Cord Tire *299
Bias Fan Belt, "Vulco-Cord" *737
Bicycle Tire, "Everlaster Twin Grip," Kokomo *299
Biff, A New Game 433
"Biltwell" Cord Tire *299
Blanket, Rubber, for Electric Linemen.... 682
Block's Spiral Spring Force Cup *29
Bloomers, Wading, for Children, "Everychild" *738
Blow-Out Chains, "Dobbins" *861
Patches *300, *366, *434
Boone Arch Support *157
Boots, Rubber *433, *661
Braender Cord Tire *95
British Army Waterproof, New 817
Motorcycle Coat, Waterproof 224
"Brownfoot" Rubber Boot *661
"Brownie" Skooter *738
Brush, Hair and Nail, "O.D.S." *503
"Bruxshu" Bathing Shoe, Rubber-Soled.... 503
Burke "Grand Prize" Golf Ball 663
"Butterfly" Tire *662
Caps, Bathing *503, *590
Carpet Washer with Rubber Brushes, Hamilton Beach *739
"Casco" Coil-Box Protector *590
Castle Cord Tire *365
"'Celoglas,' Stoco," Safety Goggle *590
Cement, "Kwikfix" Rubber 300
"Circomat" for Barber or Dental Chairs...*663
"Classic" Sandal *95
"Climax Compression" Inner Tube *662
Clothes Sprinkler, "Even-Spray" *30
Coat, British Motorcycle, Waterproof 224
Riding, Showerproof *30
Raincoat *30
White Rubber *30
Coil Box Protector, "Casco" *590
Cold-Water Bottle "Black Beauty" 639
Collapsible Playing Ball (British Patent).. 789
"College Cap" Bathing Cap *590
"Colonel" Golf Ball Dimpled 94
Copy Holder, "Line-a-Time" *94
Cord Fabric and Rubber Sole, "Gro-Cord". *590
Cord Tire, Bergougnan *299
Cuban, First *818
Erie *503
Gordon "Triangle Tread" *224
Inner Tube, "Horse-Shoe Re-Cord" *661
Kenyon *818
Kokomo *504
Odell *590
Patch, Squires *300
Sole, Sturgis *224
"Stronghold" *93
Crab, Bait, "Crawdad" Natural *589
"Craftsman" Shoe *155
"Crawdad" Natural Crab Bait *589
Cricket Artificial Bait *662
Cuban Cord Tire, First *818
Curling Shoe, "Neptune" *225
Cushion, Automobile, "Easy-Rest" *739
Inner Tire, "Aero" *95
"Daisy" Bathing Cap *590
"Davenport" Adjustable Curve-Rulers" *95
Dental Chairs, "Circomat" for *663
Detachable or Interchangeable Heels..*300, *433
"Diamond" Fume Mask *95
Grip Heel *157
"Disteel" Wheel *225
Diving Cap *503
"Dobbins" Blow-Out Chains *861
Doll, Sponge Rubber *817
"Double Arch" Sole Pads, English *661
Drain Flusher, "Hydromatic" *157
"Dur-a-Bul" Blow-Out Patch *365
"Duracord" Electric Cord *299
"Duratop" Rubber-Coated Fabric for Auto Tops 591
Dust Cap for Tire Valves, "Kwik-on-an-Off" *365
Wire Wheels *818
"Dustsafe" C Goggle, King *737
"Duxrane" for Automobile Tops 155
"Eagle Brand" Bagpipe *662
Golf Ball 365
Puncture-Proof Tire 155
Ear Caps, Rubber, for Radio Head Set....*156
Drum Protector for Ocean Sport, "Ocean" *861
"Easy-Rest" Automobile Back Cushion....*739
"Elasticap" Electrical Insulator *366
Electric Cord, Portable, "Duracord" *299
Electrical Insulator, "Elasticap" *366
Eraser, Ink and Pencil; "399 Tri-Ply"...*589
Erie Cord Tire *503
"Essex" Accelerator Heel Rest *682
Improved Step-Mat for Automobiles *589
"Even-Spray" Clothes Sprinkler *30
"Everlaster, Twin Grip" Bicycle Tire, Kokomo *299
"Everloc" Household Patch 737
"EverReady" Asbestos Brake Lining and Clutch Facing 729
"Everychild" Rubber Wading Bloomer *738
Fabric, Rubberized, Flexible Varnish for, "Hilo" 299
Cord, and Rubber Sole *590
"Duratop," for Automobile Tops 591
"Duxrane," for Automobile Tops 155
"Flexyde," for Men's Belts 752
Fan Belts *365, 663, *737
Faust Trouser Supporter *739
Filler, Automatic Barrel *156
Firestone Endless Air Bag *365
"Firo" Superheat Packing 300
Fish Bait, Molded Rubber *662
Crawdad Natural Crab *589
"Five-in-One" Valve-Repair Tool, Schrader. *739
"Fle-x-Met" Air Hose *155
"Flex-O-Tyte" Fan Belt 663
"Flexyde" for Men's Belts 752
Flusher for Drain Pipe, "Hydromatic"....*157
Force Cup, Spiral Spring, Block's *29
Fountain Pen, Collapsible, "Victor" *95
Convenient Writing Set, "Merchant" *95
Game, "Biff" 433
Garter Webbing, "Reelastic" *29
Garters for Children, Hickory 738
Gas Mask for Chemical Fumes *95
Or Smoke Mask, "Gasco" *504
Glove, Rubber Grip *365, 817
Rubber with Knuckles, "Knuklfit" *366
Rubberized Cotton, "Wearflex" *663
"Safety First Pull-Over" *662
Glue, Millinery, "Adheso" *590
Goggles, King "Dustsafe" C *737
Rubber-Rimmed *504
Safety, "Stoco 'Celoglas'" *590
"Willson" Safety *591
Golf Ball, Burke "Grand Prize" 663
"Colonel," Dimpled 94
"Eagle" 365
"Jayhawk" 663
Renewer, "Jiffy" *156
Gordon "Triangle Tread" Cord Tire *224
Gored Storm Rubber *94
Grasshopper Artificial Bait *662
Griffin Pneumatic Life-Saving Jacket *366
"Gripfast" Skirt Belting *225
"Gro-Cord" Cord Fabric and Rubber Sole..*590
Hair Brush and Mirror, Pocket, "O.D.S."..*503
"Beautifier" *590
Half-Sole "Portland" *591
Hamilton Beach Carpet Washer *739
Hat, British Rubber *503
Heel, Detachable or Interchangeable..*300, *433
"Diamond Grip" *157
French, with Rubber Lift *817
"Never Loosen" *155
Pads, "Air Peds" *434
Plate, Accelerator, Stanwood 300
Reinforced, "Paris," and New Half-Sole, "Portland" *591
Rest, Accelerator, "Essex" *682
with Pneumatic Inserts *94
Helgramite Artificial Bait *662
"Hickory" Garters for Children 738
"Hilo" Flexible Varnish for Rubberized Fabrics *299
"Hipco" Automobile Running Board Mat.. *94
"Hold-No-Fone" Telephone *155
"Horse-Shoe Re-Cord" Inner Tube for Cord Tires *661
"Humidyzor" Tobacco Pouch, Pearson's...*817
"Hydromatic" Drain Flusher *157
Indoor Track Shoe, "Wisco" *738
Infant's Folding Bath Tub *663
Inhaler, Automatic, "Man-Heil" *224
"Inkograph" Ink Pencil, with Rubber Plug. *739
Inner Tires *94, *95, *366
Tube for Cord Tires, "Horse-Shoe Re-Cord" *661
"Climax Compression" *662
Patcher, "Locktite Auto-New-Matic" ..*738
Insole, Pneumatic *30
Tire, "Mile Multiplier" 832
Insulator, Electrical, "Elasticap" *366
Interchangeable or Detachable Heels..*300, *433
"Jiffy" Baby Pants *157
Paint for Golf Balls *156
Jones "Never-Loosen" Rubber Heel *155
Kenyon Life-Saving Suit *93
"Kewpie" Baby Pants *433
King "Dustsafe" C Goggle *737
"KnuklfiT" Rubber Gloves *366
Kokomo Cord Tire *504
"Kwikfix" Rubber Cement 300
"Lambright" Cushion Tire *589
Latex Tires *589

"Life-Buoy" Rubber Boot *433
Life-Saving Jacket, Pneumatic, Griffin.....*366
Suit, Rubberized, Kenyon *93
"Lightning" Letter Opener *225
"Line-a-Time" Copy Holder *94
Linemen's Protectors *93, 682
"Loadometer," B. & D.........................*737
"Locktite Auto-New-Matic" Inner Tube Patcher *738
"Luck Botherless" Tire *504
Ludington Armored Pneumatic Tire........ 503
"Lyner Tyre," Tire Interliner 30
"Man-Heil" Automatic Inhaler...............*224
Marathon Automobile Running Board Mat.*157
Martin Super Cord and "Mono" Cord Tires.*224
Mask, Smoke, "Gasco" *504
Massage Spray, "Star" *818
Mason Truck Cord Tire *224
Mat for Automobile Running Board..*29, *94, *157, *300, *589, *662
Marbled or White, "La-Tite" 794
Semicircular, "Circomat" *663
Mats, Rubber, behind Soda Fountains...... 591
Maxwell Ladder Stay *591
Mayorowitz Detachable Interchangeable Heel*433
"Merchant" Fountain Pen Writing Set.... *95
"Mermaid" Hair Brush 820
Meter for Measuring Truck Loads, "Loadometer" *737
Miladi Dainti" Apron 95
"Mile Multiplier" Tire Insole.............. 832
Millinery Glue, "Adheso" *590
"Mono" Cord Tire, Martin...................*224
"Monotwin" Solid Tire *661
"Motomat" Automobile Running Board Mat.*662
Motorcycle Coat, British 224
Pedal Rubber, "Vitalic" *300
Mullikin Overshoe Tire *589
Nail and Hand Brush, "O.D.S."..............*503
Nathan Automobile Radiator Cover Operated from Driver's Seat.......................*817
"Neptune" Curling Shoe *325
"Never-Loosen" Rubber Heel, Jones.......*155
"Nitrex" to Prevent Oxidation of Tires and Rims 225
"Nokut" Tire Plug *591
Non-Skid Heel, Squeegee *225
Novel Sub-tire, "Planet" *504
Outing Balmoral Shoe, "Pastime"..........*157
"O. D. S." Nail Brush and Hair Brush....*503
"Ocean" Ear Drum Protector for Ocean Sport *861
"One-Set" Printers' Rollers *759
Packing, "Firo" Superheat 300
"Parco" Inner Tire *366
"Paris" Heel *591
Parker Supersize Cord Tire.................*434
"Pastime" Outing Balmoral *157
Patch, Household, "Everloc" 737
Repair Outfit, "Super Patch Rubber-Tite" 738
"Repairo" Self-Vulcanizing *155
"SlaPatch" for Large Blow-Outs 737
Tire Blow-out *300, *366, *434, 737
Pearson's "Humidyzor" Tobacco Pouch....*817
Pedal Rubber, Reinforced, "Vitalic".......*300
"Pedalgrips" for Fords.......................*818
Pencils, Attachment for *224
Pens, Fountain *95
"Philco" Slotted Battery Retainer..........*662
"Planet" Sub-Tire *225
Plug, Tire, "Nokut" *591
Pneumatic Insole *30
"Portland" Half-Sole *591
Printers' Rollers, Rubber, "One-Set" 759
"Protexal" Rubber Suit *504
"Pull-Over, Safety First," Glove...........*662
Pulverman "Tirometer" Valve for Tires....*434
Radiator Cover Operated from Driver's Seat, "Nathan" *817
Radio Head Set for Airplanes...............*156
Rain Guard for Fords, Stephens............*739
Raincoat, New Practical *30
Rapson Non-Slip Unpuncturable Tire......*156
"Reelastic" Garter Webbing *29
"Reindeer" Tire *662
Reliner for Tires, "Wear-Ever" 739
Repair Kit, Patented, Taylor-Rogers.......*661
Tool for Tire Valves, Schrader "Five-in-One" *739
"Repairo" Self-Vulcanizing Patch *155
Rollers, Printers', Rubber, "One-Set"...... 759
Rubber Snake Toy *300
Storm, Gored *94
Suit and Safety Goggles....................*504
Rulers, Adjustable Curve, "Davenport".... *95
"Rubber-Tite, Super-Patch," Tube Repair Outfit 738
"Safety First Pull-Over" Glove.............*662
Sampson Expanding and Contracting Rubber Stopper *504
"Samson" Fan Belt *365
Sandal, "Classic" *95
Schrader "Five-In-One" Valve-Repair Tool.*739
Seaplane, Toy, to Assemble..................*30
"Service" Bathing Cap *503
"Shirtholds," New Device for Trouser Waistband *29
Shoe, Athletic, "Wisco" *738
Basket-Ball, "Wisco" *738
"Craftsman," for Working People.........*155
Indoor Track, "Wisco".....................*738
Protector *365
Sport, New White 818
Skooter, "Brownie" *738
"SlaPatch" for Large Blow-Outs............ 737
Snake, Toy, Rubber *300
Soda Fountain Mat 591
Sole, New Cord Fabric and Rubber, "Gro-Cord" *590
Pads, "Air-Peds" *434
English, "Double Arch" *661
Sponge Rubber Doll *817

*Illustrated

"Squeegee" Heel *225
Sprinkler, Clothes *30
Lawn or Garden, Rotary *820
Squires Cord Tire Patch *300
Stanwood Accelerator Heel Plate.......... 300
"Star" Massage Spray *818
Steam-Curing Bag for Tire Repair Vulcanizing *818
Steamship Mail by Flying Boat............. 94
Step-Mats or Step-Plates, Automobile..*29, *94, *157, *300, *589, *662
Stephens Rain Guard for Fords.............*739
"Stoco 'Celoglas'" Safety Goggles..........*590
Stopper, Expanding and Contracting, Sampson *504
"Stronghold" Cord Tire *93
Sturgis Cord Tire Sole........................*224
"Suction Grip" Ladder Foot *299
Suit, Rubber, "Protexal" *504
"Super Patch Rubber-Tite" Tube Repair Outfit 738
Syringe Valve Shut-Off *663
Taylor Tennis-Racket Sheath, Rubber.......*661
Telephone—"Hold-No-Fone" *155
Receiver, Watchcase *433
"Tenax" Asbestos Sheet Packing...........*646
Tennis Ball, "Truflite"........................ 682
Racket Cover, Taylor....................... 661
"Tiger Lily" Bathing Cap.....................*590
Snail of Australia, "Crawling-Bug"...... 93
Tire Accessories, New *434
Achilles *662
Air Container *94
Alarm, Flat *591
Bicycle, Kokomo, "Everlaster Twin Grip"..*299
Cord, Black and Gray, Bergougnan.......*299
Cuban, First *818
"Eagle" Puncture Proof.................... 155
Edwards Sectional Solid Cushion........*29
"Erie" Cord *503
Insole, "Mile Multiplier..................... 832
Interliner, "Lyner Tyre"..................... 30
Kenyon Cord *818
"Life," Preservative for Rubber Goods.. 224
Martin *300
Molded Cord *95
"Mono," Martin *300
"Monotwin" Solid *661
Motor Truck, "Samson".....................*737
New Bicycle *299
New Overshoe *589
New Three in One, "Luck Botherless"..*504
Of Classic Design *94
Novel Design, "Stronghold"...............*93
"Parco" Inner *366
Patch *300, 832
Patcher, "Auto-New-Matic" *738
Plug, "Nokut" *591
Pneumatic 503
Rapson Non-Slip, Unpuncturable.........*156
Repair Steam Curing Bag...................*818
Repair Valve Tool.............................*739
Rugged Cord *365
"Samson" Motor Truck.......................*737
Sectional Solid Cushion, Edwards.........*29
Shoes and Reliners from Pulled Fabric.. 29
Sole, Cord *224
Solid, "Monotwin" *661
Standard and Oversize.......................*590
Sub-Tire, "Planet"............................*504
Supersize Cord *434
Tool, Self-Adjustable *299
Triangle Tread *224
"Triple Airless" *29
Truck Cord *224
Solid, "Samson" *737
Tube, Climax Compression..................*662
Repair Outfit 738
"Vulpa" 832
Unpuncturable *156
Valve, "Air-Lock" *591
and Gage in One, Pulverman "Tirometer" *434
Automatic Safety, The "Whistler"......*366
"Newsom" *434
Pulverman "Tirometer" *434
"Whistler" *366
with Non-Skid Tread.........................*299
within a Tire—Sub-Tire......................*225
Tires, Motor Truck, Big and Little "Samson" *737
Three New Western, Latex..................*589
"Tirometer," Pulverman, Combined Valve and Gage for Tires.........................*434
Tobacco Container, Purse-like...............*156
Pouch, Pearson's "Humidyzor"..........*817
Pouches, Transparent 224
Tool Kit for Vulcanizing........................ 95
Valve-Repair, Schrader "Five-in-One"....*739
Toy Balloons, Valves and Squawker Ends for 366
Doll, Sponge Rubber..........................*817
Seaplane to Assemble.......................*30
Snake, Rubber *300
"Tong-em-on" Vulcanizer *433
Traveling Case, Plaid.........................*156
"Trex" Tire Tool...............................*299
"Triangle Tread" Cord Tire, Gordon......*224
"Triple Airless Tire *29
"Diamond" Rubber Belting................ 300
"Tri-Ply, 399," Ink and Pencil Eraser.......*589
"Trojan" Tire *94
Trouser Supporters *29, *739
"Truflite" Tennis Ball........................ 682
Tubing, "Fle-X-Met"...........................*155
"Tymco" Running Board Mat or Step Plate.*300
"Utility Fitwell" Baby Pants.................*93
"United" Automatic Barrel Filler...........*156
V-Fan-Belt, "Vulco-Cord" *737
Vacuum Cleaner, Detachable................*818
Valve, Balloon, Toy, and Squawker Ends... 366
Shut-Off for Syringes......................*663
Tire, "Air-Lock" *591
"Newsom" *434

Pulverman "Tirometer" *434
"Whistler" *366
Tool, Repair, Schrader, "Five-in-One"...*739
Varnish for Rubberized Fabrics, Flexible, "Hilo" 299
"Victor" Collapsible Fountain Pen.........*95
"Victory" Bathing Cap........................*503
"Vitalic" Motorcycle Pedal Rubber........*300
"Vulcanize It" Patch........................... 299
Vulcanizer, "Tong-em-on" *433
Vulcanizing Tool Kit........................... 95
"Vulco-Cord" Bias and V-Fan-Belts.........*737
"Vulpa" Inner Tube and Patch............... 832
Wading Bloomer, "Everychild"..............*738
Watch-Case Telephone Receiver.............*433
Waterproof, British Army.................... 817
British Motorcycle Coat.................... 224
"Wear-Ever" Tire Reliner..................... 739
"Wearflex" Rubberized Cotton Gloves......*663
Wheel, "Disteel"...............................*225
Wheels, Wire, Dust Cap for..................*818
"Willson" Safety Goggles.....................*591
"Wisco" Basket-Ball and Indoor Track Shoes *738
Writing Set, Fountain Pen, "Merchant".... *95
New Incorporations....34, 100, 161, 235, 307, 371, 441, 516, 595, 670, 746, 822
Jersey Rubber Trade....38, 106, 176, 237, *309, 378, 446, 521, 598, 674, 748, 824
Trade Publications....33, 97, 162, 230, 302, 370, 437, 508, 588, 665, 740, 819
Uses of Rubber, Five Thousand Pounds in Prizes for 728
Year's Greetings...................(*Editorial*) 201
Newcomb, Melvin B...............(*Obituary*) 438
Nitrex for Tires and Rims.................... 225
No Profiteering in Rubber...........(*Editorial*) 707
Slump in Sight......................(*Editorial*) 785
North America, Rubber Tariffs of............ 81
Nut and Bolt, Safety Interlocking............*363

O

OBITUARIES—
Alling, Wilbur S......................(*Portrait*)*163
Atwood, Professor George S.................. 303
Barber, Ohio Columbus; estate..........368, 755
Bayer, Friedrich 759
Bendel, Max D. 592
Blake, Theodore Whitney 303
Bohning, Ch. C. 838
Carlton, Frank Tyler........................... 592
Cary, Charles H. 163
Cassirer, Dr. Hugo............................. 838
Cole, Dr. Charles K............................ 438
Cramp, William Quigley ....(*Portrait*)*369
Crawford, Sir Richard 31
Cummings, George W. 98
Cutler, Frederic Farley 759
Dieterich, Professor Karl..................... 506
Doyle, Judge Dayton A......................... 438
DuPuy, Harry W. ....(*Portrait*)*759
Harral, Major William Wright................ 98
Hazell, Sergeant Arthur W.................... 32
Kaufman, Jacob ....(*Portrait*)*592
Kraus, Samuel 439
Luders, Charles Frederick........(*Portrait*)*439
Macbean, Edward 98
Mayberry, Alec J. ....(*Portrait*)*438
McGraw, Edwin C. ....(*Portrait*)*666
Monroe, Robert I.............................. 666
Murphy, Michael F. 439
Neidner, Mrs. Augusta 228
Newcomb, Melvin B. 438
Picher, Oliver S.....................(*Portrait*)*592
Putnam, George E. B......(*Portrait*) 163, *228
Reithoffer, Karl 838
Rice, William Ellis............................. 228
Royal, Horace M. 438
Servis, William Hall..............(*Portrait*) 31
Shepherd, Jr., Frederick H................... 32
Slattery, Edward J............................. 98
Stone, I. Frank 592
Thomas, Mrs. Fannie E........................ 439
Thompson, H. P.....................(*Portrait*) *32
Vail, Theodore N. ....(*Portrait*)*506
Weston, George 303
Whitehead, Alfred ....(*Portrait*)*368
Wileman, Joseph Philip 593
Williams, Frank A.............................. 303
Wright, R. E. 228
Yonei, Genrijo 98
"Ocean" Ear-Drum Protector....................*861
Ohio Rubber Trade......*39, 107, *173, *240, *314, *380, *449, *524, *601, *677, *753, 828
Oil from *Hevea* Seeds.......(*André Dubosc*) 43
Oil-Proof Air Compressor, Curtis..............*430
Oliver, N. E.........................(*Portrait*)*104
Open Shop Cities ....(*Editorial*) 708
Opportunities and Inquiries. Trade....43, 99, 166, 229, 285, 369, 439, 509, 593, 660, 741, 833
for Handicapped Men in the Rubber Industry" ....(*Book Review*) 97
"Organization of Industrial Scientific Research" ....(*Book Review*) 820
Osterloh, A. F. ....(*Portrait*) *42
Osterrieth, Colonel Leon 72, 835
Our Protest Against Radicalism...(Editorial) 69
Outing, Rubber Industries Athletic League.. *32

P

Pacific Coast Trade...*42, 111, 174, 242, 317, 383, *453, *527, *605, *680, *756, 831
Slope, Storage Battery Developments on the. 668
Packing, "Firo" Superheat..................... 300
Smoked Sheets, A Suggested Method of....*136
Pants, Baby, "Jiffy"...........................*157
"Kewpie" *433
"Utility Fitwell" *93
Paper Sole, It Killed the..........(*Editorial*) 404
Pará and Manáos Rubber Statistics............ 775
Pardee, A. L...............(*Portrait and Sketch*)*172
Partridge, A. G........(*Portrait and Sketch*)*308
Frederick, E..............(*Portrait and Sketch*)*174

Patch, Household, "Everloc" 737
New Casing, Squires *300
Reinforced Blowout, "Dur-a-Bul" *366
"Repairo" Self-Vulcanizing *155
Tire Blowout, "Porcupine" 434
Patent Leather, Rubber, Wanted...(*Editorial*) 480
Patentees, British Institute of.....(*Editorial*) 2
Patents—
Adjudicated 726
and Trade Marks Regulations......187, 256, 440
Chemical....24, 86, 150, 220, 291, 361, 428, 497, 583, 656, 730, 811
Other Chemical..................151, 220, 291
Decisions, Patent Commissioner's........... 10
Designs..*57, *117, *187, *256, *323, *462, *537, *540, *615, *616, *683, *693, *770, *845, *846
Machinery.....*27, *92, *154, *222, *298, *364, *431, *502, *587, 659, *735, *814
Other Machinery...28, 92, 154, 223, 298, 364, 432, 502, 587, 659, 736, 815
Process..28, 92, 154, 223, 298, 364, 432, 502, 587, 659, 736, 815
Recent, Relating to Rubber...56, 116, 185, 254, 322, 386, 460, 538, 613, 691, 768, 843
Trade Marks...57, 117, 186, 255, 323, 387, 461, 539, 614, 692, 769, 844
Pay Envelopes, Substituting Bank Deposits for (*Editorial*) 69
Peace Problems and Progress......18, 89, 144, 204
Peachey, S. J.—
Peachey's New Vulcanization Process...... 729
Process, Possibilities of the................ 787
Pearson, Henry C.—
Rubber—The One Normal Commodity (*Portrait*)*135
Pearson's Tobacco Pouch, "Humidyzor"......*225
Pedal Rubber, Reinforced, "Vitalic"..........*300
Peeler, Roller and Applier for Tire Treads...*296
Penang Rubber Statistics............390, 772, 847
Pencil, Ink, with Rubber Plug, "Inkograph"..*739
Pencils, Attachment for......................*224
Penny Wisdom..................(*Editorial*) 403
Perfection Tire & Rubber Company, The.....*316
"Perpetual" Repairable Air-Bag..............*815
Philippine Agricultural Investment, Rubber (*Hevea Brasiliensis*) as a..................*557
Philippines, *Hevea* Planting in.....(*Editorial*) 202
Picher, O. S...........(*Obituary—Portrait*)*592
Pigment Weighing Machine.....................*501
Pigments and Colors in Rubber Compounds (*Calvin Stitt*) 425
Pilot Balloons *160
Plamondon Clutch and Gear....................*502
Plantation Futures ....(*Editorial*) 708
Pará Rubber, Preparation and Vulcanization of ....(*Book Review*) 665
Rubber, A Forecast 358
American ....(*Editorial*) 633
In 1919, Position of...................... 406
Share Profits ....(*Editorial*) 70
Rubber in West Dutch Borneo (*J. W. Evans*) 54
Plastic Materials, Determination of the Softening of *667
Plastics, Planting for.............(*Editorial*) 270
Plastometer *140
Pneumatic Insole *30
vs. Solid Truck Tires...........(*Editorial*) 270
Pneumatics for Trucks, As to......(*Editorial*) 337
Poisons in the Rubber Industry (*Norman A. Shepard and Stanley Krall*) 75
Benzol 582
Portable Elevator or Piling Machine, "Revolvator" *501
Ports, Free, More Needed........(*Editorial*) 69
Precision Tool Grinder, Lafayette............*814
"Preparation and Vulcanization of Plantation Pará Rubber" ....(*Book Review*) 665
Press, Hose, Lead Encasing Hydraulic.......*657
Vulcanizing, Rodless Hydraulic............ *91
Prices, Highest and Lowest..58, 118, 188, 257, 326, 391, 465, 541, 618, 695, 772, 847
Of Cotton and Cotton Products....(*Charts*) 489
Process Patents....28, 92, 154, 223, 298, 364, 432, 502, 587, 659, 736, 815
Production, Not Selling, Is the Problem (*Colonel Samuel P. Colt*) 344
Profit Sharing, Piece Work and Bonuses (*Editorial*) 786
Profiteering in Rubber, No........(*Editorial*) 707
Protectors, Coil Box *590
Publications, New Trade..33, 97, 162, 230, 302, 370, 437, 508, 588, 665, 740, 819
Pulley Tread, "Pulmore" 783
"Pulmore" Pulley Tread 783
Putnam, George E. B. (*Obituary—Portrait*) 163, *228

Q

Quadrant for Determining Yarn Number and Weight *361
Quotations, Rubber Company Share..35, 103, 167, 234, 305, 373, 515, 669, 745, 821

R

Racks, Cooling and Drying...................*297
Radicalism, Our Protest Against..(*Editorial*) 69
Radio Head Set for Airplanes...............*156
Rate Setting, Time Studies as a Basis for, (*Book Review*) 437
Reclaimed Rubber Market..59, 118, 188, 257, 326, 392, 465, 541, 617, 694, 771, 847
Reclaiming? Germany Revolutionizes, (*Editorial*) 70
Rubber, Runge Solution Process for...... 141
Reducing Waste in Rubber Factories (*Robert C. Kelley—Charts*) *7
"Reelastic" Garter Webbing *29
Reinforced Heel, "Paris," and New Half-Sole, "Portland" *591
Reiss, C. E...........(*Portrait and Sketch*)*173
Reithoffer, Karl ....(*Obituary*) 838

†A correction.
*Illustrated.

Repair Kit, Patent *661
Outfit for Tire Tubes, "Super Patch Rubber-Tite" 738
Tire, Applying to Worn Casings......... 659
Repairmen, Practical Advice To (*A. B. Zwebell*) 435
"Report of Ceylon Chamber of Commerce for the Year 1919"........(*Book Review*) 588
"To Board of Trade of The Empire Cotton Committee, 1920" ....(*Book Review*) 588
Republic Rubber Corporation, The...........*442
Retainer, Battery, Slotted *662
Retreader, Tire, High Pressure.............*296
Retreading, Practical Hints on (*A. B. Zwebell*) 159
Revolvator or Piling Machine................ *30
Rhode Island Rubber Trade..*105, *176, 310, 378, 448, 522, 599, 674, 749, 826
Rice, W. E. ....(*Obituary*) 228
River of Rubber, The *464
Robertson Process Metal 167
Rockhill, L. C.....................(*Portrait*)*171
Romein, J. P.—
Better Rubber Trees 5
Royal, Horace M.................(*Obituary*) 438
Rowen, E. P. ....(*Portrait*)*104
Rubber Ambitions, Japanese .....(*Editorial*) 133
Armor for Airplane Gasoline Tanks........*726
Association of America, Inc...44, 88, 164, 226, *271, 367, 455, 530, 594, 664, *742, 819
Balls Brand Walnuts.........................*485
Band Cutting Machines *430
Bands 434
Buffing Machine *734
for Floor Tiling..................... *67
Cement, Millinery, "Adheso" 590
"Kwikfix" 300
Machine for Applying *153
Clean at the Source ....(*Editorial*) 403
Company Dividends..35, 102, 167, 234, 305, 373, 441, 515, 595, 669, 745, 821
Company Share Quotations..35, 103, 167, 234, 305, 373, 515, 669, 745, 821
Compounds, Colors and Pigments in, (*Calvin Stitt*) 425
Expansion of, During Vulcanization, (*Charts*) (*C. W. Sanderson*)*292
Cripple Creek ....(*Editorial*) 270
Crude, Assuring the Supply....(*Editorial*) 785
Division Meeting of American Chemical Society ....20, †87, 498, 712
Dormant in Dutch and British Guiana.... 687
Factory Foremanship (*James Wright Cary*) 145
Goods, Eyelets and Grommets In........ *11
Guayule Is, Not a Substitute..(*Editorial*) 555
Hose in Painting, Asphalt and Cement Coating *797
In Base Balls *303
In the Safety Council...................... 347
Industries Athletic League Outing........ *32
Instead of Typesetting.................... *73
Leaders of Industrial Relations (*Editorial*) 338
Leather, Footwear ....(*Editorial*) 708
Looking Ahead in Crude ......(*Editorial*) 202
Machinery Triumphs ....(*Editorial*) 269
One Normal Commodity, The, (*Henry C. Pearson—Portrait*)*125
Patent Leather Wanted ....(*Editorial*) 480
Plant Survey of Western North America, A (*Book Review*) 230
Plantations in Mexico, American (*Editorial*) 201
Planting in Kamerun..(*Alfred Dominikus*)*535
Notes......*46, *182, *250, *321, *535, *611, *686, *765
Profiteering in, No..............(*Editorial*) 707
Rainbows ....(*Editorial*) 338
Raw, Preparation of....(*E. de Wildeman*) 24
Reclaiming Process, The Runge Solution... 141
Reserve, An American.........(*Editorial*) 202
Salvaging from the Deep ......(*Editorial*) 133
Scrap Market..64, 128, 196, 264, 326, 398, 473, 550, 628, 702, 780, 858
Shortage, The Coming ....(*Editorial*) 707
Sponge Manufacture in France and America 180
Stealing Stopped ....(*Editorial*) 270
Suit and Safety Goggles......................*504
Swelling in Solvents.....(*André DuBosc*) 24
Tariffs of Asia, Oceania and Africa....... 568
Europe 415
North America 81
South America 13
(See also Foreign Customs Changes).199, 459
Tree Diseases *612
Vulcanized, Hardness of, Some Methods of Testing the ....(*H. P. Gurney*)*140
Washer Cutting Lathe, Automatic.........*658
What Machinery Has Done for (*Editorial*) 479
Rubberized Fabrics, Varnish for, "Hilo".... 299
"Rubber-Tite, Super Patch," Tire Tube Repair Outfit 738
Rubrax for Mixing with Rubber............. 166
Runge Solution Process for Rubber Reclaiming 141
Running Board, Automobile Step Plates for. *29, *94, *157, *300, *589, *662
Ruston, William B.....(*Portrait and Sketch*) *40

S

S. A. E. Standards Report of The Tire and Rim Division *800
S. & B. Flexible Steel Tire Molds...........*586
Safety, A Census for...........(*Editorial*) 404
Council, Rubber in the 347
Devices on Electrically Driven Calender and Mixers *90
Interlocking Nut and Bolt, Stevenson.....*363
Motor Starters *362
Salvaging of Truck Tires by the Army, The.*505
Rubber from the Deep.........(*Editorial*) 133
Sorting, and Stripping Tires................ *3
"Samson" Tires, Dunlop *737
Sandstones for Rubber Workers............*298
Scales for Auto Tires and Tubes............ *27
Scales for Rubber Compounding............*658

Schidrowitz, P., and H. A. Goldsborough—
Studies in Vulcanization: The Rubber Stress-Strain Curve ....(*Charts*)*149
School, Factory Training, the....(*Editorial*) 480
Sending the Foreman to..........(*Editorial*) 2
Schrader "Universal Five-in-One" Valve Tool.*739
Schweinert, Charles ..(*Portrait and Sketch*) 517
Scrap Rubber Market..64, 128, 196, 264, 326, 398, 473, 550, 628, 702, 780, 858
Seamless Rubber Company, The............ 597
Sears, S. H........................(*Portrait*)*104
Seeing the Short Cuts....................... 340
Sending the Foreman to School..(*Editorial*) 2
Separator Machine, Battery *502
Separators, Storage Battery, Machine for Making *502
Servis, William Hall....(*Obituary—Portrait*) 31
Setback to Filipino Progress, A (*Editorial*) 555
Shaw, John E.........(*Portrait and Sketch*) 680
Sheet Stock Cutter for Small Molded Goods.*814
Shepard, Norman A., and Stanley Krall—
Poisons in the Rubber Industry............ 75
Shepherd, Jr., Frederick H.......(*Obituary*) 32
Sherman, George W....(*Portrait and Sketch*)*520
Shilts, W. D...........(*Portrait and Sketch*)*239
Shoe Protector *365
Shorey, Frederic North—
Los Angeles Challenges Akron............*158
Short Cuts, Seeing The 340
Shortage, Rubber, The Coming....(*Editorial*) 707
Signal, Novel, for Factory, "Klaxocator"....*152
Simplified Chemical Names ....(*Editorial*) 1
Singapore Gutta Percha Exports 536
Hevea Confusa in *46
Rubber Auctions..59, 119, 189, 258, 327, 393, 466, 695, 772, 847
Skooter, Brownie *738
"SlaPatch" for Large Blow-Outs 737
Slattery, Edward J.................(*Obituary*) 98
Slicing Machine, Tire Tread, Pneumatic......*223
Slump in Sight, No..............(*Editorial*) 785
Slusser, Clifton ....(*Portrait and Sketch*)*795
Smith, Casper ....(*Portrait*) *36
Smith, C. H. ....(*Portrait*)*104
Society of Automotive Engineers, Standard Reports of Tire and Rim Division of.....*800
American Chemical, Rubber Division Meetings ....20, †87, 498, 712
for Testing Materials, Annual Meeting.... 596
Soldier, Disabled, Employing the..(*Editorial*) 1
Solution Mixer, "Eimco" *500
Triplex *657
Solvent Recovery System.....................*584
Storage System, Rubber *658
South America, Cotton In.................... 19
Rubber Tariffs Of 13
American Notes 687, 839
Southern and Eastern Notes..107, 111, 177, 237, 309, *375, 445, 521, 596, *672, 747, 823
Specifications for Mechanical Rubber Goods, Government 214, 649, 805
Government, for Balloon Fabrics.......... 9
Standard, for Rubber Tires, Tire Repairs and Accessories 351, 419
Spicer, John T.........(*Portrait and Sketch*)*237
Splice, Insulator, Electrical, "Elasticap"......*366
Splicing Balata Belting *160
Splitting Extruded Double Solid Tires, Machine for *92
Sprinkler, Clothes *30
"Squeegee" Heel *225
Standardization and Golf Balls....(*Editorial*) 556
Starbird, Frank K.....(*Portrait and Sketch*)*677
"Star" Massage Spray *225
Starters, Safety Motor *362
Statistics—
Antwerp Rubber Arrivals..118, 189, 259, 329, 395, 468, 695, 774
Belawan Crude Rubber Exports.......... 847
Brazil Rubber Exports and Imports..61, 119, 189, 258, 390, 469, 622, 700, 775, 853
Canada Rubber Exports and Imports..62, 128, 195, 264, 333, 397, 472, 549, 626, 700, 852
Ceylon Rubber Exports and Imports..59, 119, 189, 391, 469, 542, 618, 695, 772, 847
Cotton Exports and Imports..65, 130, 265, 334, 400, 474, 552, 630, 781
Federated Malay States Rubber Exports and Imports..59, 119, 189, 258, 390, 469, 542, 618, 695, 772, 847
French Indo-China Rubber Exports and Imports 542
Great Britain Rubber Exports and Imports..62, 128, 195, 263, 331, 398, 472, 547, 627, 700, 779, 852
Italy Rubber Exports and Imports..195, 263, 331, 547, 627, 853
Java Rubber Exports and Imports..59, 119, 189, 258, 391, 469, 542, 618, 695, 772, 847
Malaya Rubber Exports and Imports....59, 119
Pará and Manáos Rubber Exports........ 775
Penang Rubber Exports and Imports...390, 772, 847
Straits Settlements Rubber Exports and Imports..59, 119, 189, 258, 327, 390, 469, 542, 618, 695, 772, 847
Sumatra Rubber Exports and Imports..258, 469, 542, 618, 695
United Kingdom Rubber Exports and Imports..62, 128, 195, 263, 331, 398, 472, 547, 627, 700, 779, 852
United States Crude Rubber Arrivals..60, 120, 259, 327, 393, 466, 543, 619, 696, 771, 849
Custom House Statistics........701, 778, 851
Rubber Exports and Imports..59, 63, 124, 192, 261, 331, 391, 396, 469, 470, 543, 548, 618, 624, 697, 699, 776, 777, 854, 856, 857
Stealing, Rubber Stopped.........(*Editorial*) 270
Steam-Curing Bag for Tire Repairs, "Twentieth Century" *225
Steam Hose, Construction of (*J. M. Bierer*) 724
Steel Tire Molds, Flexible, S. & B...........*586

Stedman, Jr., Arthur W., (*Portrait and Sketch*) *236
Step-Plates, Automobile, "Service," "Tymco," *29, *94, *157, *300, *589
STEVENS, DR. HENRY P.—
Nature of Vulcanization, The (Parts I and II) 22, 85
Notes on Accelerators 719
Stone, I. Frank .... (*Obituary*) 592
Stopper, Expanding and Contracting *504
Storage Battery Developments on the Pacific Slope 668
Separators, Machine for Making *502
System, Rubber Solvent *658
Straits Settlements Rubber Statistics..59, 119, 189, 258, 327, 390, 469, 542, 618, 695, 772, 847
Stranding Machine, Two-Head Vertical *91
Stress-Strain Curve, The Rubber ..... (*Charts*) (*P. Schidrowitz* and *H. A. Goldsborough*) *149
Nature of (*E. Hatschek* and *H. A. Goldsborough*) *149
Strikes and Unrest, As to .... (*Editorial*) 269
General, Kansas Strikes at ...... (*Editorial*) 404
Stripping Dipped Goods from Curing Forms..*659
Stripping Machine for Toy Balloon *659
"Stronghold" Cord Tire *93
Sturgis Cord Tire Sole *224
STUTZ, C. C.—
The Metric System Applied to the Rubber Industry .... (*Chart*) *481
Substituting Bank Deposits for Pay Envelopes (*Editorial*) 69
Sulphur in Rubber Compounds, Method for Determination of 426
Mixtures, Rapid Method for Determination of 356
Sumatra Rubber Plantation, Life on a *423
Rubber Statistics......55, 258, 469, 542, 618, 695
Swelling of Rubber in Solvents (*André DuBosc*) 24
Synthetic Asphalt, German .... (*Editorial*) 134
Rubber, German, An Examination of (*Lothar E. Weber*) *71
Syringe, Fountain, Trimming Machine *296
Syringe Valve *663

T

"Table of Tensile Strengths of Rubber, A" (*Book Review*) 508
Tank, Portable, for Rubber Cement *26
Tape, Insulating, Adhesive, Proposed Specifications for 653
Tapping Knife, New Brazilian *53
Tariff Notes 685, 838
Tariffs, Rubber, of Asia, Oceania and Africa. 568
Europe 415
North America 81
South America 13
"Tech's" New Industrial Plan ..... (*Editorial*) 202
"Tensile Strengths of Rubber, A Table of" (*Book Review*) 508
Testing Machines, Fabric *583, *652
Machines, Recent Improvements in *563
The Hardness of Vulcanized Rubber, Some Methods of .... (*H. P. Gurney*) *140
Shipping Boxes *796
Textiles, Testing, Proposed Tentative Methods for 723
Thermometers, Recording, for Rubber Vulcanizers *221
Thomas, John W. .... (*Portrait and Sketch*) *308
Mrs. Fannie E. .... (*Obituary*) 439
Thompson, H. P. .... (*Obituary—Portrait*) *32
Time Recorder *430
"Time Studies as a Basis for Rate Setting" (*Book Review*) 437
TINGLEY, R. S.—
Cotton Warehouse Financing, Old and New Methods in *710
TIRE—
Accessories, New *434
Achilles *662
Alarm, Flat *591
and Rim Division, S. A. E. Standards Report of the *800
Tube Plant, Electric Drive in a (*H. F. Barton*) *642
Apparatus, Carlisle Cord *814
Bead Manufacture...... (*Robert C. Kelley*) *790
Bicycle, Apparatus and Manufacture *432
Buffing Stand *26
Builder *813
Builder, Cord or Fabric, Banner *735
Solid *27
Banner *735
Building Fabric *222
Machine *430
Machine *735
Building Machine *27
Machine, Automatic Cord *734
Machine, Mathern *584
Stands *585
Casing Inspecting Machine *658
Casings, Worn, Repaired 659
Cord, Apparatus, Carlisle *814
Black and Gray, Bergounan *299
Cuban, First *818
Dunlop "Samson" Truck *737
Erie *503
First Cuban *818
of Novel Design, "Stronghold" *93
Standard and Oversize *590
"Triangle Tread," Gordon *224
with Non-Skid Tread, Biltwell *299
Core Remover *222
Cutting Machine, Solid *221
Demountable Rim for Solid *222
Double Solid, Machine for Splitting Extruded *92
"Eagle" Puncture Proof 155
Elastic Fabric for Building *222
Fabric and Long-Staple Cotton (*L. W. Alwyn-Schmidt*) 640
Cleaning Machine *813
Guaranties and Adjustments, Question of ... *231
Impregnator *92, *431
Inflator, Oil-Proof *430
Portable, "Lectroflator" *27
Interliner, "Lyner Tyre" 30
Kenyon Cord *818
"Life," New Compound 224
Lining Machine *585
Loom and Building-Machine, Combined, Schaeffer *735
Molded Cord *95
"Monotwin" *661
New Bicycle *299
Overshoe *589
Three in One *504
Patches, Blow-Out, Manufacture of (*A. C. Squires*) *647
Plant Layout, A Modern... (*M. A. Pearson*) *635
Pneumatic 503
Press Cranes *657
Hydraulic *152
Production for 1920 .... (*Editorial*) 404
in the United States 713
Repair Air Bag *815
Mold and Vulcanizer *814
Novelties *585
Right and Wrong of a Blow-Out *505
Steam Curing Bag *818
Valve Tool *739
Repairing and Rebuilding, Machinery Equipment for *348
Practical .... (*A. B. Zwebell*) *576
Retreader, High Pressure *296
Rim, Demountable *222
Rugged Cord *365
"Samson" Motor Truck, Dunlop *737
Sectional Solid Cushion *29
Shoes and Reliners from Pulled Fabric 29
Sole, Cord *224
Solid, Demountable Rim for *222
Splitting Machine, Solid *92
Sub, "Planet" *225, *504
Supersize Cord *434
Testing Machine, Motor Driven *296
Tool for Repairing Valves *739
Self-Adjustable *299
Tread Slicing Machine, Pneumatic *223
"Triple Airless" *29
Truck Cord *224
Tube Building Machine *587
Climax Compression *662
Cushion *95
"Horse-shoe Re-Cord" *661
Mandrel *587
Patch Buffers *297
Repair Outfit 738
Scale *27
Unpuncturable *156
Tubes, Inner, Machine for Making *587
Valve and Gage in One, Pulverman "Tirometer" *434
Automatic Safety *366
Valves, Dust Cap for *365
Vulcanizer *813
Within a Tire, "Planet" Sub-Tire.... *225, *504
Tires and Tubes, Old, New Uses for *410
Cord, Two, Martin "Mono" and Super *300
Designs for...*57, *117, *187, *256, *324, *387, *462, *540, *615, *683, *770, *846
French Tests of Pneumatic and Solid 114
Giant Cord, for Motor Trucks *143
Heavy Service .... (*Editorial*) 202
International Discussion of Clincher and Straight Side 796
Motor Truck, Big and Little, Dunlop "Samson" *737
Pneumatic Truck, Word of Caution Concerning .... (*J. Newton Gunn*) 295
vs. Solid Truck .... (*Editorial*) 270
Pneumatics for Trucks .... (*Editorial*) 337
Rubber, British Standard List of for British Standard Rims *570
Foreign Import Duties on 355
Salvaging, Sorting and Stripping *3
Solid and Pneumatic, Motor Truck Efficiency as Related to .... (*S. V. Norton*) *564
Not Doomed .... (*Editorial*) 633
The Dollar Is Biggest in Buying *799
Tire Repairs and Accessories, Rubber, Government Standard Specifications for..351, 419
Toron and Toron-Treated *803
Truck, Salvaging of, by the Army *505
Trains and .... (*Editorial*) 634
Tobacco Container *156
Pouch, Pearson's "Humidyzor" *817
Pouches, Transparent 224
Tool Grinder, Universal, Lafayette Precision..*814
Kit, Vulcanizing 95
Toron and Toron-Treated Tires *803
Tote Boxes, Stacking *26
Toy Bagpipes *662
Balloon Stripping Machine *659
Balloons, Valves and Squawker Ends for.... 366
Rubber Snake *300
Seaplane to Assemble *30
Tiger Snail of Australia, "Crawling Bug".. *93
Trade, American Rubber, News, Notes and Personals...35, 101, 167, 234, 305, 373, 441, 515, 595, 669, 745, 821
Trade Marks..57, 117, 187, 255, 323, 387, 461, 539, 614, 692, 769, 844
Foreign, Safeguard in Japan.... (*Editorial*) 2
Training and Apprenticeship, Industrial (*Editorial*) 134
in the Rubber Industry...... (*Book Review*) 97
School, The Factory .... (*Editorial*) 480
Tread Roller, Peeler and Applier *296
Treasury Decisions 10, 98, 163
Tree Diseases, Rubber *612
Trees, Better Rubber .... (*J. P. Romein*) 5
"Triangle Tread" Cord Tire, Gordon *224
Trimming Machine for Fountain Syringe and Water Bottle *296
"Triple Airless" Tire *29
Triplex Solution Mixer *657
Tropics, A Fund for Botanical Research in the. 802
Trouser Supporters *29, *739
Truck Efficiency, Motor, as Related to Solid and Pneumatic Tires...... (*S. V. Norton*) *564
Load Meter, "Loadometer" *737
Trains and Tires .... (*Editorial*) 634
"Truflite" Tennis Ball *682
Tubing, Fle-X-Met" *155
Tweedy, O. S. .... (*Portrait and Sketch*) *791
"Twentieth Century" Steam-Curing Bag for Tire Repairs *225
Typesetting, Rubber Instead of *73

U

United Kingdom Rubber Statistics....62, 128, 195, 263, 331, 398, 472, 547, 627, 700, 779, 852
States Army Methods of Procuring and Salvaging Rubber Articles *211
United States Commerce in Crude Rubber for Calendar Year 1918 96
Crude Rubber Arrivals....60, 120, 259, 327, 393, 466, 543, 619, 696, 771, 849
Custom House Statistics 701, 778, 851
Exports of India Rubber Manufactures for Year 1919 789
Rubber Company, Annual Report of 511
Statistics..59, 63, 124, 192, 261, 331, 391, 396, 469, 470, 543, 548, 618, 624, 697, 699, 776, 777, 854, 856, 857
Tire Production in 713
Promotes Sales Executives 518
"Universal Five-in-One" Valve Tool, Schrader.*739
"Universal" Adjustable Dust Cap for Wire Wheels *225
Utility of the Rubber Heel .... (*Editorial*) 70

V

V-Fan Belt, "Vulco-Cord" *737
Vail, Theodore N. .... (*Obituary—Portrait*) *506
Valve Nut Tightener *586
Syringe *663
Varnish for Rubberized Fabrics, "Hilo" 299
VERNET, G.—
Coagulation of *Hevea* Latex 24
Volume Increase of Compounded Rubber Under Strain *208
Vorhis, H. S. .... (*Portrait and Sketch*) *829
Vulcanization Accelerator with Aromatic Base (*J. L. B. Hasselt*) 655
by the Use of the Sulphur Reaction Product of a Nitrogen Accelerator 80
Expansion of Rubber Compounds During (*C. W. Sanderson*) (*Charts*) 292
Process, Peachey's New (*Stanley John Peachey*) 729, 834
Possibilities of the Peachey 787
Nature of, The (Parts I and II) (*Dr. Henry P. Stevens*) 22, 85
Studies in (*P. Schidrowitz* and *H. A. Goldsborough—Charts*) *149
Vulcanized Rubber Goods, Methods for Physical Testing *715
Methods of Testing the Hardness of (*H. P. Gurney*) *140
Vulcanizer, Footwear, Pressure-Cure *28
High Pressure, Sectional *586
Recording Thermometer for *221
Retread Mold and Sectional, Pacific *814
Temperature Controller *586
Spot, for Factory Damaged Rubber Goods..*813
"Tong-Em-On" *433
Vulcanizing Press, Rodless Hydraulic *91
"Vulco-Cord" Bias-Woven and V-Fan Belts...*737

W

Wading Bloomers for Children *738
Walnuts, Rubber Balls Brand *485
War Department Specifications for Mechanical Rubber Goods—III 805
Warner, S. L. .... (*Portrait and Sketch*) *172
Washer, Carpet, With Rubber Brushes *739
Cutting Lathe, Rubber *658
Waste Material Dealers, National Association of Scrap Rubber Classification 804
Reducing, in Rubber Factories (*Robert C. Kelley*) 6
Water-Bottle and Fountain-Syringe-Trimming Machine *296
Requirements for Rubber Mills (*Walter J. Bitterlich*) 791
Wax, Sweet, New Compounding Ingredient... 655
"Wear-Ever" Tire Reliner 739
WEBER, LOTHAR E.—
German Synthetic Rubber, An Examination of *71
Webbing Garter, "Reelastic" *29
Weighing Machine, Pigment *501
Wesley, P. R. .... (*Portrait*) *105
Weston, George .... (*Obituary*) 303
Wheel, "Disteel" *225
Whitehead, Alfred ...... (*Obituary—Portrait*) *368
Wildman, William Wallace (*Portrait and Sketch*) *671
Wileman, Joseph Philip .... (*Obituary*) 593
"Wisco" Athletic Shoes, Basket-Ball and Indoor Track *738
Witsaman, G. H. .... (*Portrait*) *110
Wooden Calender Shells *152
Work, B. G. .... (*Portrait*) *108
Wright, Clarence H. .... (*Portrait*) *42
R. E. .... (*Obituary*) 228

Y

Yarns, Electrical *412
Yonei, Genrijo .... (*Obituary*) 98
Young, John .... (*Portrait and Sketch*) *108

Z

ZWEBELL, A. B.—
Hints to Repair Men 648
Practical Advice to Repairmen 435
Hints on Retreading 159
Tire Repairing *576

INDIA RUBBER WORLD

CAOUTCHOUC — HEVEA BRASILIENSIS — FOUNDED 1889 — DICHOPSIS GUTTA — GUTTA-PERCHA
Reg. U. S. Pat. Off. Reg. United Kingdom

Edited by HENRY C. PEARSON

Vol. LXI. No. 1. OCTOBER 1, 1919 35 CENTS $3.00 Per Year. $3.50 Abroad.

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC GUTTA PERCHA

Reg. United States Pat. Off. Reg. United Kingdom.

Published on the 1st of each month by

THE INDIA RUBBER PUBLISHING CO.
No. 25 West 45th Street, New York.
Telephone—Bryant 2576.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, F.R.G.S., Editor

Vol. 61. OCTOBER 1, 1919. No. 1.

SUBSCRIPTION: $3.00 per year, $1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, $3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft. Post Office or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

DISCONTINUANCES: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

TABLE OF CONTENTS ON LAST PAGE OF READING.

THE MEXICAN RIDDLE.

DURING THE LAST EIGHT YEARS Mexico has been more or less a land of mystery. All manner of conflicting rumors regarding the political and economic situation have come forth from that country of revolution and counter revolution. Accurate reports have generally been lacking, but it is well known that gross injustices have been committed upon American citizens and against American property rights which have brought about a virtual paralysis of American enterprises of all sorts in that country and have necessitated the abandonment of vast acreages of rubber and various agricultural products.

With the formation of the National Association for the Protection of American Rights in Mexico and the organization of a concerted effort to remove the causes of friction between the United States and Mexico, the public will hear more accurately of developments below the Rio Grande, and there is hope that something worth while may be accomplished.

Political affairs appear to be nearing a crisis in Mexico, and it is believed either that the Mexican people will stabilize conditions sufficiently within a year or two to give adequate protection to foreign capital and industries, or that it will be done for them. Mexico has much that the world needs badly, and it is reasonable to suppose that the world will secure these commodities through intervention and the establishment of a protectorate, if necessary to ensure stable conditions.

Meanwhile far-sighted Americans will cultivate closer social relations with the better class of Mexicans; study their needs and customs and lay the foundations for future business, for not in years has the sentiment of large Mexican commercial interests been so favorable to better business relations with the United States.

SIMPLIFIED CHEMICAL NAMES.

THE RUBBER INDUSTRY welcomes the determination of the Council of the American Chemical Society to confer with the Chemical Society of England and the Society of Chemical Industry in an effort to promote uniformity in the names of chemicals and their spelling and pronunciation in the interest of clarity and for the purpose of facilitating commerce and industry.

Until recently the rubber industry has been relatively free from names of troublesome length and difficult pronunciation. With the advent of organic accelerators, however, which followed in the train of synthetic rubber experiments, came many new chemical names formidable enough to stagger anybody other than a chemist familiar with their derivation and meaning. For example, paranitroso dimethylaniline, hexamethylene tetramine, thiocarbanilide and paraphenylenediamine are a few of names of commonly used organic accelerators. Whatever indicative value such names may have for the analytical chemist, they are certainly a nuisance to the practical rubber man and the purchasing agent, and suitable shorter equivalents for everyday use are desirable.

EMPLOYING THE DISABLED SOLDIER.

EMPLOYING OUR SOLDIERS disabled in the late war and making them self-supporting and self-respecting is a theme frequently enlarged upon and which is worth while emphasizing again. The president of a large rubber company has set an example to which the attention of all is respectfully called. In seeking a solution of his own labor shortage, he instituted a careful analysis of every process in his factory. A card record was made of each operation in which a cripple could be used, and special mechanical arrangements of a simple and practical character were designed to facilitate the work and to overcome the disablement.

Many lines of employment were found open in electrical lines also, and the particular jobs in which disabled men could be used have been carefully listed. Over 80 per cent of the men injured in the great war have been provided for by the Allies and what has been done abroad

can certainly be accomplished here. Of this number the British declare that fully 60 per cent of injured men had been reinstated in their old positions. The results of rehabilitation are declared to have been satisfactory in most instances.

SENDING THE FOREMAN TO SCHOOL.

A timely and invaluable suggestion for the improvement of the human factor in large manufacturing plants has been made by John Calder, M.E., in an address before a editorial conference in New York City. In brief, Mr. Calder advocates a systematic course of instruction for foremen, and supports his suggestion with logic that should appeal to every thinking employer. He said in part:

"We now know that human engineering, tackled in spots only, such as safety, welfare and employment, has been, as a whole, neglected in industry where it counts most. . . : The foreman's education has been sadly neglected and yet he is the man, and the only man in authority, who makes contact with our workmen through half of their walking hours. . . . Not only must we cultivate more intensively in every plant and industry the modern production methods now highly elaborated, but we must set about to greatly enlarge the intelligence of those who must carry out these methods, namely, the foremen, the non-commissioned officers of industry. This is of great importance. No ideas are of much lasting benefit in any plant unless they are well told to the foremen and only a mere fraction of the present-day literature on how to analyze and handle the human factors in industry is intelligible to the foreman who must do this work in detail."

Mr. Calder then relates how courses of instruction for foremen and heads of departments begun a few months ago now number several thousand men, devoting themselves to this class of study for three months at a time.

"Sending the foreman back to school at the expense of the employer is a new idea to most owners, who have been willing to spend money on things much less worth while," he says. "But if that school is held in an employer's own plant, aims at a definite objective and makes a family party of the occasion it is found to be a most fruitful source of enlightenment and enhanced good will. . . . The art of management and supervision has been well worked out to date, so far as the chief executives are concerned, and it calls for an ever-increasing and high order of ability. It has sometimes been inclined to belittle the foreman and at other times to ignore him. Yet we have a fair supply of good managers to-day and are calling loudly not for them or for advisory engineers, but for competent foremen, not merely to criticize but to supervise successfully and to 'deliver the goods,' with the only kind of help now available, at a cost that makes good business and with due regard to the aspirations and interests of labor.

"It is to discover this man in each plant, to develop him where known, to create an interest in his job and to retain that interest, both in it and in his employes, that this educational movement has been specially prepared and offered as something new and necessary at this epoch in our industrial history."

BRITISH INSTITUTE OF PATENTEES.

Through the organization of a body to be known as the Imperial Institute of Patentees, British patentees and patent owners hope better to guard their interests and to effect desirable modifications in existing patent law. Among its objects are to procure an extension of the life of those patents which have been held up during the war by controlled firms; to assist patentees who have failed to find other support, and to reduce the high cost of a British patent, which is $500 for a term of fourteen years as contrasted with $35 for a 17-year patent in the United States.

The new organization has the support of the National Union of Manufacturers, the Federation of British Industries, the Associated Chambers of Commerce, and others interested in better patent laws, and would seem to be in a position to accomplish much in the interests of British manufacturers that will facilitate reconstruction in Great Britain.

FOREIGN TRADE-MARKS SAFEGUARDED IN JAPAN.

A decision of great importance to exporters everywhere is that of the Supreme Court of Japan, in a suit instituted by a Philadelphia manufacturing company for the protection of its trade-mark rights, which upholds in every essential and without qualification the validity of American trade-marks properly registered as guaranteed under Japan's treaty with the United States. It also protects trade-mark owners in every country having similar treaty agreements with Japan against native infringement.

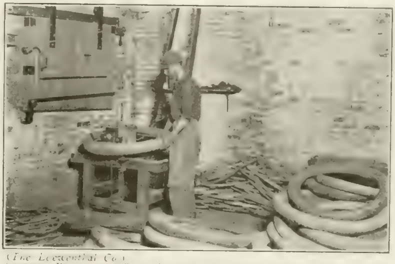
This decision, epochal in world trade and exemplifying international fair play, places the spirit of Japanese law on the highest plane and favorably affects manufacturers whose annual product runs into billions of dollars. By this act Japan has benefited herself immeasurably, for safeguards against the forgery and plagiarism of trademarks have great significance in international trade. Good-will has a higher commercial value today than ever before in history.

Wearers of rubber shoes in Moscow, Russia, must pay to the local Soviet a tax of 20 rubles ($10.30) per pair. The shoes cost the victim 300 to 400 rubles ($154.50 to $206). No doubt there is a law compelling the bourgeois to wear them, else there would be small tax returns from this item.

Salvaging, Sorting, and Stripping Tires.

The vast number of automobile tires discarded by the motoring public includes a notable percentage capable of yielding considerable additional mileage at low cost when rebuilt. In fact, the business of tire rebuilding is becoming nation-wide in extent and increasing in volume. The great unrepairable mass of old tires contains also a large tonnage of salable fabric of great value, useful for many manufacturing purposes.

The salvaging operations on rejected automobile tires provide profitable work for rubber scrap dealers who are developing it to the uttermost. The large scrap dealers are specializing extensively in automobile tire scrap. It is their business to receive old tire stocks from the collectors and sort them into the recognized grades of the waste rubber market. These are officially described in the circular E of the National Association of Waste Material Dealers and listed in the order of their relative value. (See The India Rubber World August 1, 1919, page 658.) The grades and current prices are: standard white auto, 5½ cents; standard mixed auto, 5 cents; stripped, unguaranteed, 4½ cents; white G. & G. (Goodrich and Goodyear), 5¾ cents; white M. & W. (Morgan & Wright) and White, U. S., 5⅞ cents.



(The Loewenthal Co.)
Cutting Beads from Tire Casings. A Partly Severed Bead Is Seen Curving Upward from the Circular Knife, and in the Background Is a Pile of Cut Beads.

SORTING OLD TIRES.

Sorting old tires is not a highly specialized operation but a simple matter of skill in inspection and quick individual handling. The most expert sorting is picking out guaranteed makes suitable for rebuilding which means selection of tires with perfect beads, only minor defects of fabric, a limited number of small blow-outs, and no rim cuts or loose plies.

Repairable tires are graded into No. 1 inners, which are good stripped carcasses; No. 2 Inners, containing only a single blow-out; and the ordinary repairables with more than one blow-out. Repairable tires are sold on a graded price-list according to damaged condition, the price running from 8 to 15 cents per pound. All unrepairable tires are subjected to the processes of dissection for salvage of fabric and separation of the various rubber scrap qualities used by the trade.

(The Loewenthal Co.)
Starting Fabric Plies. The Succession of Steps May Be Noted From Left to Right in the Picture, Comprising Reversing the Tire, Cutting, and Starting the Plies to be Pulled.

BEADING OLD TIRES.

The first operation is the removal of the bead from the casing. This is quickly accomplished in a simple machine known as a bead trimmer.

The tire is thrown over the machine and rests on a series of rollers. On one side it is slipped over a crowned roller which fits the inner surface of the tire, while on the outside at the corresponding point is a circular knife. Pressure on a foot treadle revolves the tire by action of the crowned roller inside the tire and sends the circular knife downward through the tire side-wall just above the bead, which is rapidly severed, allowing its removal by the operator. The tire is reversed and by repetition of the operation the other bead is removed.

From the beading machine the carcass passes on to receive preparation for the operation of pulling out the fabric plies. This preparatory operation is starting the plies by hand.

STARTING THE PLIES.

The conveniences for starting the plies of a bead-free tire carcass are extremely simple. They consist of a stout timber about five by eight-inches and two feet long, supported horizontally at a convenient height for working. The tools consist of a screw-driver with a short blade, a short knife with the point curved after the manner of a pruning blade, and a heavy pair of ordinary hand-nippers.

The stages of the work of starting the plies are shown in succession in the illustration, beginning in the background. The worker places the carcass upon the beam or support, then depresses it as he turns it half inside out near the blow-out. Next he holds it securely in position on the support by resting a portion of his weight in the lower loop of the carcass, while with the point of the knife he cuts through the number of plies, three for example, which are to be started up for stripping. The cut is made near the blow-out and the plies separated across by means of the screw-driver. Once started, they are pulled back with the nippers a distance of about a foot. Following this the carcass is cut apart at a point just beyond the blow-out and is thrown aside ready for the pulling machine.

PULLING FABRIC STRIPS.

There are various machines used for pulling tire fabric from the carcass. They comprise means for holding the tire and for seizing the free ply-end, also a power connection to effect the separation. Some pulling machines are arranged to separate the plies in long lengths from the endless tire, and others operate on cut tires. The one shown in the illustration is of the latter type.

By suitable power transmission a proper ratio of speed is obtained between the pulling elements, one of which hold the end of the tire while the other serves as a wind-up for the separated fabric. The fabric, as pulled, winds in a roll on the pulling spindle from which it is easily removed. A convenient arrangement enables the operator to stop and reverse the mechanism whenever necessary, for he is obliged to pull up by hand an [illegible] end. The machine is actuated by a foot treadle

(*The Loewenthal Co.*)
Pulling Fabric from Tire Carcasses. The Tread Stock Winds on the Drum While the Pulled Fabric Winds on the Spindle, Each in Opposite Directions. The Products May Be Noted on the Floor and in the Baskets.

and is speedy in operation. With such a machine a skilful workman can strip 25 or more tires per hour, producing practically 1,000 pounds of pulled fabric per ten hours.

The auto treads from which all but one or two plies have been pulled are designated in the scrap rubber trade as "Auto Tread Stock" or "Dyke's Peelings." This is sorted by quality and color the same as the original tires and stored preparatory to baling for shipment to the rubber reclaimer.

Machine-made tires permit separation of single plies in continuous length from uncut tires. Wide pulled fabric is obtained by cutting away the edges of the tire beads and removing the plies full width, pulling out the bead cores as they are exposed in the process. Fabric of this sort is especially adapted to tire rebuilding purposes because of its width.

STRIPPING TIRE BEADS.

Tire beads, cut from the tires as described above, contain a core of wire or hard rubber surrounded with rubberized fabric. The latter has distinct value and is removed for rubber reclaiming purposes. Hard rubber bead cores, ground fine, are used as a filling in low-grade small molded rubber goods, mats, matting, etc.

STRIPPING BEAD FABRIC.

The bead circles from the bead trimmer are cut once preparatory to prolonged boiling in a tank of water or live steam, where the grip of the fabric on the core is loosened. The stripping could be done by machine, but ordinarily is accomplished by hand power.

A workman with pliers frees the fabric from one end, placing the exposed core or center in the grip of a pair of tongs hanging overhead, and by direct pull strips down the covering material of fabric and rubber, known as "coreless beads."

GRADES OF SALVAGED RUBBER AND FABRIC.

A descriptive list of qualities of rubber and fabric salvaged or dissected from discarded automobile tires follows:

Repairable Tires.

Stripped and Road-Worn Tires.—Casings as rejected by the motorist. They are valuable chiefly for the friction rubber reclaimable.

Beadless Tires.—Beaded but not stripped.

No. 1 Peelings.—Rubber stock free of fabric cut by hand from tread and side walls.

No. 2 Peelings.—Similar to No. 1 peelings, but containing breaker and some building fabric.

Auto Tread Stock (Dyke's Peelings.)—The fabric carcass minus beads and three or four plies of salvaged duck plies.

Coreless Beads.—The material stripped from the cut beads.

Ground Bead Cores.—This stock is no longer valued and has dropped from the market because of its low grade.

Buffings.—This is a by-product produced in the manufacture of new tires and inner tubes, and in the operations of tire repair men.

Pulled Automobile Fabric.—Single or multiple-ply as specified. This is a recent development and is extensively used in rebuilding and repairing tires, and the manufacture of tire boots or patches and reliners; also in the manufacture of a variety of small rubber articles where strong fabric is required.

Pulled tire fabric is now an important item of supply in the automobile tire accessory, tire repair and rebuilding trades. Reliners and blow-out boots made up from sound pulled fabric, properly prepared, are recognized as equal in serviceability to such articles produced from new fabric. The extensive demand existing for this merchandise made from salvaged fabric has induced some members of the large scrap rubber organization to specialize in its manufacture in addition to the work of salvaging.

CONCLUDING RETROSPECTION.

Salvaging fabric in scrapped goods is by no means new. Thirty years ago a mechanical goods factory stripped the fabric from scrapped hose, dipped it in cement and made it up again into garden hose which sold at a very low price.

So, too, both the English and the French have devised processes for using finished fabric either with its rubber content or without. French rubber chemists, for example, devised processes for removing the rubber in scrapped tire carcasses without injuring the fabric. One process, the De Villers, consists in treating the rubber-impregnated fabric with boiling hot tetrachlorethane in two stages, together with the intermediate use of a filter press to separate the fabric from the rubber in solution. The fabric is practically free from rubber and used in the manufacture of various small articles for which cotton duck is used.

(*The Loewenthal Co.*)
Stripping Tire Beads. Boiled, Hot, Cut Beads from the Tank at the Left Are Readily Stripped from the Cores and Form the Pile at the Right.

In another process, the Debauge, the rubber-impregnated fabric is treated three times with xylol subjected to heat and powerful agitation in vacuum to dissolve the rubber, the cloth after each treatment being placed in a washing machine with cold xylol to remove rubber particles still adhering to it, also resin and free sulphur, and is finally rinsed and dried in a current of warm inert gas.

Better Rubber Trees.

By J. P. Komen.

Now that hundreds of thousands of acres have been planted with *Hevea* rubber and have come into bearing, the mistakes made in the beginning come to light. That mistakes were made is not surprising, considering the feverish haste in which this planting was done. The directors and investors were probably not familiar with the principles underlying agricultural enterprises and expected only as speedy returns as possible, on the money invested. At the time of the rush not enough technically trained men were available to take care of the new undertakings, and as a result we now have to face many problems which would not have come up had the foundations been properly laid. Some of these mistakes can be remedied, others cannot, except by cutting down the whole plantation and starting anew. While in the end this might pay, stockholders and investors naturally are loath to chance it, especially as every well-managed plantation brings in a substantial dividend as it stands. But with keener competition and diseases demanding more attention, it is imperative to any company undertaking new plantings to avoid the mistakes made in the past.

Luckily the scientific side of the industry is gaining recognition and confidence by the practical planter. Yet today it is practically only the question of diseases which receives attention, while the more important point of correct planting is neglected nearly as much as it was in the beginning of the planting industry. I call this point more important because the matter of diseases does not demand attention until after the plantation has been well established, while the trees, once planted are there to stay. Now and then something has been said about breeding a better strain of *Hevea,* and seed selection has been given some consideration but no serious attempts have been made to improve the situation.

A SIGNIFICANT COMPARISON.

To make clear the faults of the present system of planting, I should like to compare a rubber plantation to an orchard. Following the same methods as those employed in planting *Hevea,* the procedure in an apple orchard would be as follows:

A number of apples would be gathered, composed of perhaps two hundred varieties, good and bad. The seeds would be taken out and the soundest ones selected and planted in a seed-bed. After a set time a number of seeds would germinate and these would be planted, discarding all the rest. In planting, the young trees would be planted, say 9 by 18 feet. When, after a number of years, the trees began to bear, they would be found to be too crowded and half would be thinned out. Selection as to the merit of the fruit would be carried out as far as possible without disturbing the planting distances too much.

How soon would a fruit farmer be in the poorhouse if he followed the above method? And why are our rubber plantations planted in exactly that way? Because they pay dividends as it is, or because it was always done that way?

RUBBER GROWING IS MORE HORTICULTURE THAN FORESTRY.

Some persons contend that a rubber plantation cannot be compared to an orchard, that it should be treated as a forest. I think that many mistakes in planting find their origin in this conception. The problems of the rubber planter are not those of the forester, but those of the horticulturist or agriculturist. In such an intensive culture as that of *Hevea* the tree must be treated as an individual and not all the trees as one collective unit. The matter of diseases is one for the mycologist to deal with; improving the race is for the physiologist or the horticulturist to consider; in short, all the problems encountered by the man who has an orchard are the same as for the rubber planter. The fact that an orchard measures perhaps one hundred acres and a rubber plantation one thousand or ten thousand makes no difference. Unless each tree is given proper attention and made the best there is, the whole cannot be satisfactory.

Upon superficial inspection a rubber plantation looks very much like an orchard planted from seed. The size and markings of the seeds, the size and color of the leaves, the mode of branching, the appearance of the bark, etc., are some of the more obvious differences. And that this variability applies to the much more important factor of yield is known to every planter. The following figures, obtained during the course of an extended experiment, show the extent of this. Of 250 trees, the dry rubber yield of which was measured daily, the lowest yielder gave 16 grams while the highest gave 342 grams during the same period. These trees were taken at random, but the average for the whole lot was the same as that for the entire plantation, namely 66 grams. Now, if only trees of the type yielding 342 grams were planted in the beginning, the production of the plantation would be five times that of today. Is there any company which cannot afford to wait an extra year if necessary to make proper preparations?

I do not mean to attack the selective thinning methods advocated by progressive planters; the more systematically this is done the better. The best practice is not to plant inferior trees to begin with, so that later on selective thinning will be unnecessary. The argument that a newly formed company cannot wait any longer for rubber than is absolutely necessary is like arguing that a new factory should be erected without foundations because that will hasten production by six months.

PRINCIPLES GOVERNING STOCK SELECTION.

Then how should better planting stock be obtained? Before answering this question, I would like to point out the guiding principles which should govern the selection of stock. These principles concern:

1. Yield.
2. Disease resistance.
3. Quality of the rubber.

Yield. Besides being dependent upon external conditions, such as physical and chemical conditions of the soil, climate, and the like, the yield is an inherent character of the tree, and any amount of cultivation cannot improve it beyond a certain maximum peculiar to the individual tree.

Disease Resistance. While yield has been mentioned frequently in this connection, the question of disease resistance has been scarcely touched upon. It is a well-known fact that where one strain is susceptible to disease, another is not. This holds good in the plant world as well as in the animal world. Field mice, for instance, are highly susceptible to glanders, house mice are almost completely immune; Jersey cows are more liable to tuberculosis than Holsteins; and Yorkshire swine are more resistant to swine-erysipelas than some other porcine breeds. It has come to light in the experience of every physician that members of the same family, exposed at the same time to the same possibilities of infection show greatly varying susceptibilities. Many varieities of apples and pears cannot be grown because they are sure to fall prey to some disease, while other varieties are totally immune. Practically every planter has noted that certain trees are easily infected while adjacent trees are passed untouched. The reason for this phenomenon lies in the inherent immunity to disease in the individual tree.

Quality of the Rubber. No extensive work has been done regarding the variability in the quality of the rubber derived

from individual trees. Some differences among latices are very apparent, such as color and concentration of the latex, and it is more than probable that the intrinsic value of the rubber from one tree is better than that of its neighbor. For a thorough consideration of the problem this point should be given attention, though it is of less importance than the questions regarding yield and disease resistance.

METHODS OF IMPROVING STOCK.

The methods whereby better planting stock can be produced on the basis of the three points mentioned above may now be considered.

SEED SELECTION can never result in a uniform, highly productive plantation. The selection of seeds from trees, known to be good producers enlarges the chances that the offspring will be better yielders, than when the seed is obtained from unknown parents. But the laws of heredity show that this is nothing more than a chance, due to the number of generations of interbreeding and the cross-fertilization which takes place.

The methods for improvement based upon scientific principles present themselves as follows:

1. Breeding.
2. Seedling selection.
3. Artificial propagation.

BREEDING. In order to obtain a better strain through this method, it is necessary to isolate a single strain, which will breed true to type. Through cross-fertilization during a large number of generations, the present plantation rubber tree is of a very complex nature, and to isolate such a strain in a systematic way involves a great amount of work, to be divided over a large number of years. This is the more so because three different characteristics are involved, namely: yield, disease resistance and quality of the rubber. As a tree has to be grown for at least four years to determine the single factor of yield, it will easily be understood that the problem of breeding a really valuable strain will take more than one generation of investigators.

That scientific breeding experiments should be carried out is certain, but this should be done by the various governments concerned; for any private concern this method is entirely too costly and requires too much time for any immediate commercial purposes.

SEEDLING SELECTION. There is no way to select in the nursery the seedlings which will later develop into big producers that will be immune to disease. No morphological character is known correlated to yield. As a result of extensive experiments along this line with fully grown trees I am satisfied that shape and size of leaves, mode of branching, color and texture of bark and similar characteristics are not correlated to yield. There is a possibility that histological characters, such as distribution of latex vessels, their number or size, may furnish a clue to productivity, but as we are dealing with seedlings, these would have to be destroyed or at least seriously damaged before their value was known. While of course it is best to select the most vigorous seedlings for planting out, still this is not the solution to the problem.

ARTIFICIAL PROPAGATION. This is the method used by pomologists to perpetuate the strain or variety, which has proved valuable. The varieties of apples, pears and other fruits were originally obtained through cross-breeding, a procedure, which, for immediate results, is out of the question for *Hevea*, as has been pointed out above. For stock we have to start with the trees now on the plantation. And it is a sure fact that enough material is there to produce something much more valuable than the average we have today.

PROCEDURE TO BE FOLLOWED.

In order to obtain the best stock the following procedure should be followed:

1. Select a number of the oldest trees to be found, growing under the same conditions regarding soil and climate as those prevalent on the new plantation.

The oldest trees should be selected, because they have been under observation for a longer period than the younger ones and more is known about their yield and disease resistance. They should be chosen from a locality where soil and climatic conditions are as nearly as possible the same as those on the contemplated plantation, because a certain variety may prove excellent in one soil, while it would not be in another; it may grow well at a high altitude but break down in the lowlands. The argument sometimes put forward that selecting seed from a place where conditions are entirely different from those on the new plantation will result in better trees, is entirely without any scientific foundation.

2. Of the trees selected, choose those which show no evidence of ever having been attacked by disease.

The chance for immunity to disease is greater in such trees. This of course does not mean that these trees will never contract any disease; it simply improves the chances for a disease-proof offspring.

3. Of the remainder select the highest yielders.

To determine which is the best yielder, it is necessary to measure the dry rubber yield for an extended period, preferably one year.

4. If two or more trees yield about the same quantity, the choice should fall on the tree producing the best quality of rubber.

This point is of less importance than yield and disease resistance, unless very great differences should be found in the course of the experiment.

METHODS OF ARTIFICIAL PROPAGATION.

These may be divided into two groups, those providing for their own root systems and those where one tree is grafted upon another. It is probable that the root system is as important to latex production as are the parts above the ground.

Methods for developing root systems include marcotting and cutting. The first method, marcotting ("tjankok"), has been successfully carried out in the experimental garden at Buitenzorg, Java. It is a laborious method, however, and should be used only if every other method fails.

Cuttings were made from the first seedlings grown at Kew Gardens and shipped to Ceylon, and it can be done again. These cuttings carry with them the characteristic root system of the parent tree. This root system is a suitable one for a good producer inasmuch as the parent tree was selected for its productivity. It is barely possible that a less perfect root system will develop from cuttings and this should be investigated. If, however, cuttings develop a good root system, this method is to be preferred above any other method of artificial propagation. It is speedy and above all simpler than grafting, and can be carried out by native labor with a minimum amount of failures.

Methods whereby a good-producing, disease-resistant variety is grafted upon another root system are numerous. One of the simplest has been carried out on a larger scale lately on one of the Sumatra plantations and has proved quite successful. This method is budding. However, when resorting to grafting the thing to bear in mind is, that not only should all possible attention be given to the derivation of the bud or scion, but the stock used to graft upon should be carefully selected. Other qualifications enter into the selection of this stock than into the selection of the bud or scion. The most important is to select young trees free from any root diseases and those with the best-developed root systems. The stock can very well be grown from seed, but none except those having the above-named qualifications should be used to graft upon.

Summarizing the foregoing paper, it is found that:

1. The present method of reproducing *Hevea* should be discontinued.

2. Breeding to obtain a better strain is, for technical reasons, out of the question for any commercial firm.

3. Seedling selection offers no solution on account of the inability to know what to select.

4. Artificial propagation will overcome the difficulty.

5. Carefully selected trees should be used for propagating stock, taking into account productivity, disease resistance and quality of the rubber.

Reducing Waste in Rubber Factories.

By Robert C. Kelley.

Probably in no other industry than rubber manufacturing does so large a percentage of the material used, go of necessity into scrap. For this reason it became very easy for all waste in rubber factories to be regarded as a necessary evil, and consequently little attention was paid to it other than devising means to utilize it in the product. But in these days of accurate cost finding, and with the rising expense of labor, fabric, chemicals, power, etc., rubber manufacturers are keenly interested in methods of reducing the waste item.

While in rubber-shoe manufacturing the greater part of unvulcanized proofed cloth clippings is used over again, the loss in value is a large one. Thus, a man working on the problem of keeping waste down to the minimum not only can furnish valuable information on costs but also can be instrumental in saving thousands of dollars in material which formerly sold for junk at a small return.

GENERAL FACTORY SCRAP

DATE

STOCK	Grinding	Cutting	Quarter and Cement	Post Office	Sole Table	Light Making	Heavy Making	Stitching	Packing	General Factory	Heel	Tire	Deluxe	Tube
Plain Rag														
Insoles														
Friction Rag														
Nets-Gum Shoe														
Other Linings														
Cash and Jersey														
Wools and Fleeces														
Single Tennis														
Double Tennis														
Upper Leather														
Bottom Leather														
Stock in Sweepings														
Cement														
Uncured Gum														
Bad Heels														
Cured Gum														
Webbing														
Covered Vamps														
Covered Legs														
Covered Hip Tops														
Overflow														
Uncured Friction														
Wrappings														
Cut Shoes														
Trimmings														
Fibre Soles														
Paper														
Rag Calender														
Lining Calender														
Cut Tires														
Tube Scrap														
Breaker Scrap														
Flap Cured														
Air Bag Scrap														
Reinforcing														
Tire Trimmings														
Flap Uncured														

Daily Tally Sheet.

ACCURATE INFORMATION THE FIRST STEP.

The first step in tackling the problem is to obtain current, accurate information on the amount of scrap and its cause. It entails no additional expense to have uncured cloth scrap kept separate according to the kind of cloth and gum coating. This is collected in baskets daily and charged to the department responsible. In a factory manufacturing gum shoes, boots, tennis shoes, tires, inner tubes, heels and fiber soles, where I have seen a salvage system in operation, the waste is handled in the following manner.

METHOD OF HANDLING WASTE.

All ends and trimmings from the cloth calenders in the mill room are weighed and charged against the production of each machine. This instills a sense of responsibility in each calender man to keep his percentage as low as possible.

DAILY SCRAP REPORT

Dep't Week Ending

Stock	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Weekly Total
Plain Rag							
Uncured Friction							
Nets Gum-Shoe							
Other Linings							
Cash & Jersey							
Wools & Fleeces							
Single Tennis							
Double Tennis							
Trimmings							
Stock in Sweepings							
Daily Total							
						Grand Total	

Weekly Report to Foremen

Cutting-room scrap, from punching out insoles, filling soles, heel pieces, tennis quarters and vamps,—all inside work for rubbers, boots and gaiters, is handled directly by that department on a percentage basis as part of the individual cutting records. Many of the cutters are paid piece work rates on a sliding scale, a higher rate being paid for a low percentage of scrap, but to be successful in operation this system must be made fool-proof. All scrap from the cutting machines and hand cutters is tagged with a distinctive mark to prevent its becoming confused with the general factory scrap.

All other waste from the cutting room, such as sweepings, defective pieces thrown out in putting up the work, pressed or wrinkled leg covers and boot vamps from the rolling machine, holes in the fabric, etc., are charged to the department at fault. Bad heels are examined to determine the number due to poor press work, low pressure, bad trimming, or poor stock. The same policy is maintained throughout the plant. Thus, on the stitching room report is found the amount of tennis duck scrapped in stitching, and on that of the quarter or cement department the percentage of stock spoiled in being prepared for the boot or gum shoe teams.

In the making departments the makers at the end of their day's work return all surplus pieces to the post office to be used again on the next ticket, and leave on top of their benches all defective stock or parts scrapped through their own carelessness. Scrap due to poor calendering or poor cutting is sent out with the waste of the milling or cutting rooms while the rest is charged to the making departments. A distinction is made, however, between legitimate ends or trimmings and unnecessary waste. All of this material is tagged, signed for by the foreman of the department responsible and collected daily.

It thus becomes the first duty of the man working on scrap to see that it is collected regularly, that none is allowed to accumulate in corners or under benches, and that it is all weighed and charged correctly.

DAILY AND WEEKLY REPORTS.

The figures are made a basis for daily and weekly scrap reports showing the amounts of the different stocks thrown into scrap throughout the plant, the percentage is figured against production, and also the value in dollars and cents. One copy of the daily report goes to the superintendent every night, thus calling to his attention immediately any undue waste and furnishing first-hand information for foremen's meetings, and another copy goes to the cost department for analysis.

The foreman of each department is furnished with a weekly report showing the totals of the daily collections and the percentage for his department. In addition a chart is posted in

Weekly Scrap Report

Dept. *Week End*

STOCK Name	Pounds	Dollars
Plain Rag		
Frictioned Rag		
Insoles		
Uncured Friction		
Linings— Nets— Gum Shoe		
Linings— Sheetings and Pockets		
Wools and Fleeces		
Jersey and Cashmerette		
Upper Leather		
Leather Heels or Soles		
Cement		
Scrap found in Sweepings		
COVERED — Vamp and Quarters		
COVERED — Legs		
COVERED — Hip Tops		
Single Tennis		
Double Tennis		
Uncured Gum		
Bad Heels		
Total for Week		
Total Last Week		
Estimated Unnecessary Loss		

Cost Department Form.

each department showing the rise or fall of waste. These charts serve to stimulate an interest in keeping the departmental totals as low as possible and induce a note of competition between departments for the best showing.

METHODS OF REDUCING SCRAP.

Frequently the scrap man devises minor changes in the arrangement of departments or the routing of material in consultation with the superintendent and foremen that will reduce the scrap. For instance, it was found that by using oil or fish-cloth leaves in books for conveying work to the makers the cemented pieces would not stick to the cloth, and much material formerly scrapped because of this was saved. Along the same line it was learned that gum shoe linings became easily crushed and wrinkled when put in cloth books for team makers. Consequently a scheme was devised whereby they

No. ______ **Dep't.** ______

Date Collected ______

Kind of Scrap ______

O. K. ______

Weight ______ **Lbs.**

Tag for Scrap.

were cemented on tins, placed in a car with grooves about 3-inches apart to fit the trays, and slid in a similar compartment under the maker's bench, thus keeping them fresh and in first class condition to be made up the next day. In the cutting room it was discovered that the angle for cutting strips on the bias varied slightly on the drum where the stock was laid off, from the angle on the cutter's block, thus causing scrap ends. This was remedied and more material saved.

THE WASTE CLEARING HOUSE.

After the scrap is collected it is taken to a shed or portable building in the yard reserved for the purpose, where it is examined, baled up when necessary to sell it, and ground up to be used in various ways. Here the scrap man has another function in determining what scrap can still further be used as good material. Occasionally good stock, either intentionally or otherwise, finds its way into the scrap. This must all be returned to the department from which it came, and if there is any evidence to show that the act was deliberate, it must be reported to the superintendent.

While all small parts used in boots, gaiters, and gum shoes, such as facings, toe tips, heel pieces, stays, etc., are cut out of board scrap or cutting ends, the scrap man can very often contrive additional ways of using material. For example, a gum shoe of new construction called for a cork heel lift; enough ends or scrap from cutting soles of the same material were accordingly brought in from the scrap department and used to cut the entire ticket. Again, the tube department was having a special stock run to cut a small circular reinforcing strip for the air valves when it was discovered that side and end pieces of friction scrap from the shoe factory could be used for this purpose. In the tire department much of the fabric trimmings are used in making beads. Sometimes large sizes of tennis tops, insoles, or shoe linings can be cut down into smaller ones where the defect is slight.

Judgment must be exercised, however, as very often the labor cost of cutting down this material is greater than the value saved.

Thus the scrap man must have accurate and complete information on material and labor costs; must understand rubber goods manufacturing from A to Z, and must maintain constant touch with the superintendent and foremen.

GRINDING SHOE SCRAP.

With the proper facilities for grinding, any rubber shoe factory can find use for 85 per cent of its waste by converting it into the product. One concern which formerly baled up cloth scrap, especially that with a low percentage of rubber, and found difficulty in locating a market for it, solved the problem by installing in the scrap department a rotary cutter such as that

shown on page 288 of "Rubber Machinery" by Henry C. Pearson. All linings and nets, friction stocks and cloth coated on both sides were ground up and used in a fibrous compound as a covering for inside work known as "rag." Screens of various mesh were used from ½ to 3/16-inch. It was found to produce a much more uniform "rag" than the old method of running the scrap over the cracker directly, and made it possible to use up many more kinds of scrap.

Cloth used for tennis tops, which formerly had a poor sale baled up as scrap, especially the doubled or "stuck upper" which could not be sold at all, was all ground up to make fiber for fiber soles and heels. Bad heels were pulverized to be used over again in the cheaper grades. In fact, the only scrap to be sold under the new arrangement is cut shoes, tires, cured trimmings, and tube wrappings. Constant touch is maintained with the chemical laboratory which has been of valuable assistance in working out compounds to make use of scrap.

In brief, this is the system devised for handling the scrap problem in one rubber factory. That it has been successful is shown by a 2 per cent decrease in scrap which has been maintained for several months, and further reductions are looked upon not as a possibility but as a certainty.

GOVERNMENT SPECIFICATIONS FOR BALLOON FABRIC.

As the following specifications are subject to revision, manufacturers are advised to apply to the War Department, Air Service Engineering Division, Dayton, Ohio, for the latest rulings.

SPECIFICATION NO. 16,013-A, MARCH 25, 1919,

Supersedes Specification No. 16,013.

GENERAL.

1. This specification covers the requirements of the Bureau of Aircraft Production for balloon fabric for use in the manufacture of balloons.
2. Balloon fabric is rubberized balloon cloth.
3. Specifications Nos. 16,022-A and 16,023-B state the requirements and tests for balloon cloth and should accompany this specification to all manufacturers of balloon fabric.

USE.

4. Balloon fabrics of the various grades and numbers, as listed in Table 2, are intended for use in the construction of balloon parts as follows:

Table 1.

Type.	Part.	Fabric Number.
Kite balloon	Envelope	1 or 2
	Ballonet	3, 4, 5 or 6
	Lobes	8
	Tape	11 or 12
Dirigible balloon	Envelope	1, 2, 9 or 10
	Ballonet	3, 4, 5, 6, or 7
	Tape	11 or 12

5. Parallel doubled fabric may be designated in an order by adding the letter "S" to the number of the fabric.

MATERIAL.

6. Balloon fabric shall be manufactured from finished balloon cloth conforming in every respect to Specification No. 16,023-B.
7. The rubber coating used in balloon fabric construction shall contain the best quality rubber and the highest grade ingredients designed to give minimum permeability and the best weather-resisting qualities.

MANUFACTURE.

8. Workmanship shall be consistent with the best manufacturing practice.
9. Balloon fabric must not be overcured or undercured nor show excessive water-marks. The existence of any of these conditions will be cause for rejection and will be determined by the Chief of Balloon Inspection.
10. Two-ply bias fabric shall be made up with the bias ply on the outside unless otherwise specified in the order. The bias ply shall be set at an angle of approximately 45 degrees to the straight ply.

SELECTION OF TEST SPECIMENS.

11. Samples. A sample for tests shall be taken from every roll of fabric.
12. Additional samples for determining the uniformity of the fabric may be taken from any portion of the roll, as may be deemed necessary by the inspector.
13. Each sample taken from the roll shall be one-half (½) yard long and the full width of the roll.
14. Specimens. Tensile test specimens, each six (6) inches long and two (2) inches wide, shall be cut from each sample, parallel to the system of threads to be tested.

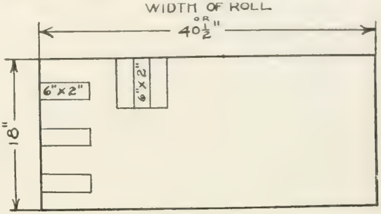


Fig. 1.

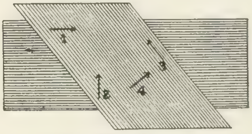


Fig. 2.

Methods of Cutting Test Specimens.

15. Three specimens of single-ply fabric or two-ply parallel fabric shall be cut parallel to the warp, and three specimens shall be cut parallel to the filling, as shown in Figure 1.
16. Three specimens of two-ply bias fabric shall be cut parallel to each system of threads under test as indicated by the arrows in Figure 2; three specimens being cut parallel to the warp of the straight ply, three parallel to the filling of the straight ply, three parallel to the warp of the bias ply, and three parallel to the filling of the bias ply.

TESTS.

17. Tensile Strength Test. The tensile test specimens, prepared in accordance with the foregoing instructions, shall be tested under existing humidity conditions.
18. The test specimens shall be tested in tension in a machine of the inclination balance type having a maximum capacity of 400 pounds.
19. The jaws of the testing machine shall be 2-1/16 inches wide and shall be three inches apart at the beginning of the test. The jaws shall separate at the rate of approximately 20 inches per minute.
20. The average breaking load of the three specimens cut in each direction shall be taken as the tensile strength of the sample which they represent. The tensile strength of the balloon fabric must be not less than that shown in Table 2.
21. Permeability. The permeability of the fabric to hydrogen shall be determined, under the following conditions, by a method and apparatus approved by the Inspection Department of the Bureau of Aircraft Production. The fabric shall remain in contact with an atmosphere of pure

Table 2.

Style No.	Number and Arrangement of Plies.	Balloon Cloth (Minimum Oz. per Sq. Yd.). Outside Ply. No.	Outside Ply. Weight.	Inside Ply. No.	Inside Ply. Weight.	Rubber Coating (Minimum Oz. per Sq. Yd.). Air Side. Weight.	Between Plies. Weight.	Gas Side. Weight.	Minimum Weight per Sq. Yd., Ounces.	Maximum Weight per Sq. Yd., Ounces.	Tensile Strength (Minimum per Inch Width), Warp and Filling, Pounds.	Maximum Permeability, Liters per Sq. Meter per 24 Hrs.
1	2 Bias	BB	2.5	BB	2.5	0.6	3.5	...	9.1	9.7	48	18
2	2 Bias	BB	2.5	BB	2.5	0.6	3.5	0.5	9.6	10.3	48	18
3	2 Parallel	AA	2.0	AA	2.0	...	3.0	...	7.0	7.7	50	18
4	2 Parallel	AA	2.0	AA	2.0	0.5	3.0	0.5	8.0	8.7	50	18
5	1	BB	2.5	...	...	...	...	4.0	6.5	7.0	45	18
6	1	BB	2.5	...	...	0.5	...	4.0	7.1	7.8	45	18
7	1	DD	4.5	...	...	0.5	...	4.0	9.0	9.8	65	18
8	1	BB	2.5	...	...	0.6	...	1.0	4.1	4.7	45	..
9	2 Bias	BB	2.5	DD	4.5	0.6	3.5	...	11.1	12.0	48	15
9S	2 Parallel	BB	2.5	DD	4.5	0.6	3.5	...	11.1	12.0	70	15
10	2 Bias	BB	2.5	DD	4.5	0.6	3.5	0.5	11.6	12.4	48	15
10S	2 Parallel	BB	2.5	DD	4.5	0.6	3.5	0.5	11.6	12.4	70	15
11	1	BB or heavier	2.5	...	...	0.6	...	3.0 uncured	6.1	3.7	..	..
12	1	BB or heavier	2.5	...	...	...	...	3.0 uncured	5.5	8.1		.

hydrogen in the testing apparatus for at least one hour before beginning the test, this time being in addition to that necessary to replace the air in the permeability cell with hydrogen. The fabric shall be maintained during the test at a temperature of at least 77 degrees F. (25 degrees C.). A current of pure hydrogen shall be maintained against one side of the fabric for a test period of at least two hours. The hydrogen current shall be under a pressure of at least 1.18 inches (30 mm.) of water above the pressure on the air side of the fabric. Dry air at approximately atmospheric pressure shall be passed over the air side of the fabric. The quantity of hydrogen that passes through the fabric shall be determined either by burning to water and weighing as such, or by any other accurate method such as that using the gas interferometer. The permeability shall be calculated in liters of dry hyrdogen, measured at 32 degrees F. (0.0 degree C.) and at 29.92 inches (760 mm.) mercury pressure. The permeability shall be expressed in liters per square meter per 24 hours.

22. The permeability of the fabric must not exceed the maximum permeability shown in Table 2.

23. Weight. The weight of the fabric shall be determined under existing humidity conditions by weighing three representative test pieces, cut out of the sample with a die, each having an area of at least 4 square inches. Weights shall be expressed in ounces per square yard.

24. The average weight per square yard of at least three test pieces must not be more than the maximum nor less than the minimum limits given in Table 2.

25. Light Test. The fabric shall be run over a bank of lights and carefully examined for imperfections of manufacture, such as pinholes, uneven spreading, imperfect doubling, wrinkles and other defects.

26. Weak or imperfect parts of the fabric which have been marked on the cloth before rubberizing, or which have been discovered in the finished fabric, shall be distinctly marked on the finished balloon fabric. Sections of cloth so marked shall be excluded or patched in cutting panels for United States Army balloons.

MARKING.

27. Finished balloon fabric shall be stamped or marked, at intervals of two feet, with the official acceptance stamp of the Bureau of Aircraft Production.

28. All rolls of balloon fabric shall be plainly tagged with the grade, the manufacturer's name or trade-mark, the date of manufacture and the Bureau of Aircraft Production order number.

INSPECTION.

29. All balloon fabric shall be subject to inspection by the Inspection Department of the Bureau of Aircraft Production under its Manual of Inspection.

30. The inspector shall at all times have free access to all parts of the factory which concern the manufacture of balloon fabric ordered to this specification, and shall be afforded every facility to satisfy himself that the fabric is in accordance with this specification.

31. Fabric rejected on account of uneven spreading, pinholes or other imperfections may be used as designated by the Chief of Balloon Inspection.

JUDICIAL DECISIONS.

A. Schrader's Son *vs.* Protex Manufacturing Co.—District Court, Eastern Division of Northern District of Ohio, November 7, 1918.

Suit to prevent the infringement of Twichell patent No. 927,298 for a gage for testing the pressure in automobile tires. Injunction granted. (Federal Reporter, Volume 254, page 438.)

A. G. Spalding & Brothers, *vs.* John Wanamaker, *vs.* Samuel Buckley & Co. of London and New York.—Circuit Court of Appeals, Second Circuit, February 13, 1919.

The suit was brought for infringement of patent No. 878,254 for a golf ball pitted with circular cavities. The sides of the cavities are very steep, at an angle of 145 degrees at the periphery. The Wanamaker ball had similar circular cavities between sides made at an angle of only 35 degrees with the surface. The court held that these would not accomplish what was claimed for the Spalding ball, that the inclination of the sides was an essential part of the patent and that, therefore, there had been no infringement. Injunction denied. (Federal Reporter, Volume 256, page 530.)

Miller Rubber Co. *vs.* DeLaski and Thropp Circular Woven Tire Co.—Circuit Court of Appeals, Sixth Circuit, May 6, 1919.

The DeLaski company brought suit for infringement of their patent, (No. 1,011,450), for a tire-wrapping machine. This patent had been declared valid in the Circuit Court of Appeals for the Third Circuit in the suit of the DeLaski company against W. R. Throop and Sons. Subsequently the DeLaski company acquired the W. R. Throop business.

The Miller company bought a tire-wrapping machine from De Laski and one from W. R. Throop; then it had two more machines built, which DeLaski asserted were made according to his patent; he sued in behalf of the W. R. Throop interests also.

The court held that the question of infringement depended on whether the pressure head or its equivalent of the DeLaski patent had been used, and decided against the Miller company, declaring that the infringement was "purposeful and inexcusable" and that there was just apprehension that it would be persisted in. (Federal Reporter, Volume 257, page 733.)

DECISIONS OF COMMISSIONER OF PATENTS.

In re Link-Belt Company.—Court of Appeals of the District of Columbia, June 2, 1919.

Court held that the Commissioner of Patents was right in refusing to register as a trade mark for rubber and fabric belts the word "Service" surmounting a bar with V-shaped ends. The word "Service" in this instance would be descriptive of the goods. "It has a fixed meaning in trade generally as indicating that goods so described are serviceable, and will notably wear well, but are especially adapted to meet the requirements of the user of the goods to which the mark is applied." Decision affirmed. ("Official Gazette," August 26, 1919.)

TREASURY DECISIONS.

No. 43314.—Protest 931413 of The Rubber Association of America, Inc. (Seattle).

Gutta Siak.—Gutta siak, classified at 10 per cent ad valorem under paragraph 385, Tariff Act of 1913, is claimed free of duty under paragraph 502.

Opinion by Hay, G. A. Gutta siak was held entitled to free entry as gutta-percha under paragraph 502. G. A. 8194 (T. D. 37759) followed.

INTERESTING LETTERS FROM OUR READERS.

AN OPPORTUNITY FOR EUROPEAN TRADE.

To the Editor of The India Rubber World:

Dear Sir:—I am writing to you with the object of calling your attention to the firm of Ing. Leone R. Talvy, via Vivajo 21, Milan, a member of this chamber, who is desirous of getting in touch with American manufacturers who may be looking forward to extending their business to European countries. Mr. Talvy is favorably quoted here and is in a position not only to cover Italy, but also Serbia, Roumania, Bulgaria, and European Turkey, being acquainted with the markets in said countries, and having branch offices in Belgrade, Serbia.

The articles in which he is more particularly interested are: tubes, sheets, gloves, cushions, ice-bags, etc., and I shall greatly appreciate your kindness, if you will supply Mr. Talvy's address to all such manufacturers whom you may happen to know, who are anxious to secure valuable connections abroad.

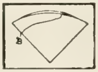
This Chamber desires to thank you in advance for the favor and if at any time it can reciprocate the courtesy, it will certainly be glad to do so,

Very truly yours,

Secretary, American Chamber of Commerce of Italy,
Via Bocchetto 3, Milan, Italy.

FOLDING FILTER PAPERS

An improved method for folding filter papers for rapid filtration follows:



Folded Filter Paper.

Instead of tearing off a corner of the filter paper tear a strip back as far as the fold at *B*, and fold over on to the other side.

This affords a double thickness nearly all around the top of paper, making it less possible for any fine precipitate to crawl over the top of paper, also preventing any air from escaping down along the side of the aper. ("The Chemist-Analyst.")

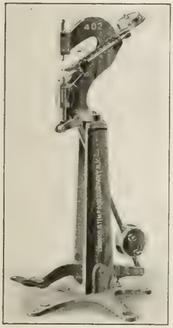
The Rubber Tire Supply Co., Inc., 420 East St. Louis street, Springfield, Missouri, has increased its capital stock from $10,000 to $20,000.

Eyelets and Grommets in Rubber Goods.

Among the little things which are used by the million in rubber factories are eyelets and their big brothers, grommets. They are used on various lines of goods, wherever a hole in the material needs strengthening so that strain upon it will not tear through. They sell at $100 to $1,500 per million, according to size, kind, quality, and finish.

MANY DIFFERENT VARIETIES.

There are many varieties. The ordinary eyelet is of brass, in one piece, much the shape of a miniature hat without a crown. It consists of a rim and a "barrel," the latter being tubular and of varying length, according to the thickness of material on which it is used. The whole may be of plain brass or may be japanned, or the rim only may be enamelled or covered with a coating of celluloid. The brass eyelet may be finished in silver, tin, copper or nickel. The enamelled and celluloid-covered eyelets are made in a large variety of colors.



The Stimpson Eyeletting Machine.

While most of these eyelets are circular, there are oval ones and long narrow ones to accommodate wide flat laces. There are also some made with scalloped or corrugated rims for ornamental purposes. These eyelets are made entirely by automatic machinery which stamps the disks out of sheet metal and draws each piece into the shape desired.

GROMMETS ARE LARGE EYELETS.

Eyelets are made in a great variety of sizes, from the little one only large enough to allow passage of the smallest twine, to those measuring one and one-half inches in diameter. The larger ones are called grommets, though in some trades this name is given to an eyelet of large size which is backed either by a metal washer, or another eyelet just enough smaller in the barrel to fit inside the larger, the two being inserted on opposite sides of the fabric, and pressed firmly together, spreading the ductile barrels, and thus showing rims alike on both sides.

The under side of the common eyelet, when in place, shows the barrel split into six or eight sections which radiate evenly from the center. This effect is accomplished in two ways. If the barrel is scored the "set" of the machine breaks it at the scored lines. If the barrel is not scored, a corrugated "set" is used in the machine, which cuts the barrel into these sections, and curves them, as the pressure is applied.

RUBBER TRADE LARGE USERS.

In the rubber trade, footwear manufacturers are the largest users of eyelets. Shoes which close by lacing require them—principally hunting and lumbermen's boots, bootees, and other heavy duck lines. Some short rubber boots are made with an oblong "knob pull-on" in place of a pull-strap or loop, and in order that these boots may be hung up when not in use a grommet is placed above the pull-on.

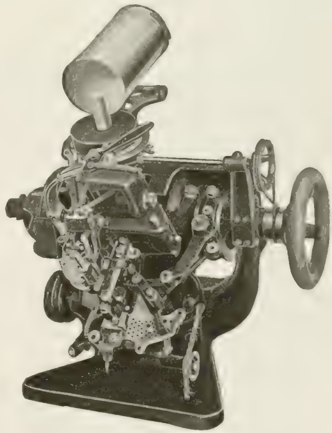
But the large use is in the production of tennis shoes. The common, low-priced "sneakers" made by the million, consume eight to twenty in each shoe. These are of the low-priced variety. To-day the tennis lines have been improved in style, in quality of material, and in workmanship, and in place of the plain brass eyelets, those of finer quality, enamelled or celluloid-covered, are used, matching in color the fabric in which they are inserted, or finished in contrasting colors.

LACING STUDS.

Besides eyelets, or in place of them, lacing studs are used in men's and boys' footwear, and to some extent upon puttees and leggings. The lacing hook is an adaptation of the eyelet and is used to facilitate fastening the shoe. It is not used extensively on women's and misses' footwear, mainly because the hooks were found to catch and tear women's skirts, and although present fashions of short skirts obviate this objection, they have not become popular on feminine footwear. The lacing stud is practically an eyelet, with an extension bent over to form a flat, button-like hook which obviates the necessity of inserting the lacing through an eyelet.

MACHINES FOR SETTING EYELETS.

There are various machines made for "setting" eyelets and studs. The small hand tool, much like a leather-punch, is the simplest. Next, there are adaptations of the same mechanism, by which the eyelet is set by pressure of the foot on a treadle. Then come machines which punch the holes, insert the eyelets, and carry forward the work the proper distance for the next eyelet. These machines are quite complicated. The eyelets or studs are poured into a hopper in which is a revolving brush, which places them right side up in a raceway whence they are fed to the proper point for insertion. These machines have a capacity limited only by the ability of the operator, some men being able to eyelet 4,000 pairs of shoes per day.


Duplex Eyeletting Machine.

DUPLEX MACHINES.

There are machines which set two eyelets at once, on opposite sides of the lace space, thus insuring exact matching to

each other. Other machines set in "gangs," inserting at one pressure several eyelets in a row in the lace-stay, and this row may be either straight, or curved to conform to the shape of the lace-stay.

One adaptation of the machine is for producing the "blind eyelet" effect which is in vogue in the best grades of leather footwear. The machine punches the holes through the several thicknesses, but sets the eyelets through all except the outside ply, thus giving strength to withstand the strain, yet showing no eyelet when the boot is laced.

EYELETTING TENNIS SHOES.

Another, and necessarily more complicated machine is used for inserting grommets, or eyelets with washers. For these, two hoppers and their accompanying raceways are required, one for each member of the duplex eyelet, together with mechanism for delivering the opposing members, one above and the other below the fabric or material through which it is to be inserted.

EYELETS AND GROMMETS IN RUBBER CLOTHING.

Rubber clothing manufacturers use many eyelets in garments, these being inserted liberally in spaces under the arms to allow ventilation. For a similar purpose, they are also inserted in hats and caps and especially cape-caps and havelocks. There are eyelets or grommets in ponchos, and millions were used in these during the early years of the great war. There is still a demand for ponchos from the Far West, and for export. Rubber blankets are provided with grommets. They are also used in bath curtains. Manufacturers of reducing belts of sheet rubber or rubberized fabrics consume thousands of eyelets. Household aprons are provided with eyelets, as are also aprons used by workmen and workwomen in certain trades. Fountain syringes and hot water bottles have large grommets in the tabs by which they are suspended.

GROMMETS IN AUTO TOPS AND CURTAINS.

Grommets are largely used in automobile tops and curtains. Some of these are specially shaped for the purpose of fitting over button fasteners, either plain or turn-buttons. One adaptation is a patented fastener containing springs which grasp the button firmly, which can be unfastened only by pulling in a certain direction, indicated by a dot on the upper member of the eyelet-like fastener. These fasteners are also coming into use on luggage, cases for sporting goods and musical instruments, and other articles of leather and its substitutes. Special tools and machines are made for inserting them.

These are some of the uses for metallic reinforcements of perforations in rubber and rubberized material manufactures.

NEW PRICES FOR TENNIS SHOES.

FOLLOWING THEIR CUSTOM of many years' standing, but from which they departed last year, the various rubber manufacturers which include tennis shoes in their list of products sent out new and revised price-lists early in September. As in former years, the United States Rubber Co. took the lead, arranging its mail so that its customers in all parts of the country received the new price-lists simultaneously on the first day of the month. Then soon followed those of the Apsey, Beacon Falls, Converse, Hood and other rubber companies.

As expected, prices for the coming season are higher than those of a year ago, as those were higher than the previous year. Many lines show an advance of 10 per cent, while a goodly number have advanced 15 per cent, and a few, a still higher percentage. However, taken all in all, the trade is to be congratulated that the advance is so moderate, when it is considered that cotton duck and other textiles cost more than double the prices of a year ago, and labor has very materially increased. One material only has declined, crude rubber, but all compounding materials have advanced enough so that it is hardly likely the rubber soles of these shoes can cost any less than a year ago.

The common every-day "sneaker" probably shows as high a percentage of increase in price as any except some of the finest quality shoes. In the larger sizes these show a uniform advance of 15 cents per pair and the smaller 10 cents per pair. Men's Bals which sold in 1917 at 68 cents a pair, net, were marked up to 85 cents in 1918, and are now priced at $1, while the youth's Oxfords, 60 cents in 1917, were 65 cents last year and 75 cents in the present catalog, while children's Oxfords were respectively 45 cents, 55 cents and 70 cents in the three price-lists.

In the medium quality goods, such as the "Campfire" line of the United States Rubber Co., the "Nantasket" of the Apsley Rubber Co., the "Yale" of the Converse Rubber Co., and the "Lakeside" of the Hood Rubber Co., the prices have advanced 15 or 20 cents; men's Bals from $1.35 to $1.50 and men's Oxfords from $1.20 to $1.40, while boys' and misses' sizes which were $1.10 are now $1.25 and other sizes proportionately.

In the high-priced goods, having rubber heels and soles with narrow foxing, prices show a proportionate advance. Men's Bals which were quoted at $2.15 last year are now $2.50, and Oxfords which were $2 are now $2.35. The lines in imitation welt have advanced 35 cents per pair, men's Oxfords from $2.40 to $2.75 and women's from $2 to $2.35.

The companies are vying with each other in producing handsome lines of welt construction, on lasts closely following those used by the up-to-date manufacturers of leather shoes. Each company has its own way of bottoming these shoes in welt construction, lasted by experienced shoemakers, the women's lines with Louis or military heels and the toes following the narrow graceful lines which are now so popular. These boots run as high as $4 a pair, and pumps at $3, while men's Bals of similar make and quality are priced at $3.75 and Oxfords at $3.25.

Several companies are now producing lines of workingmen's shoes, made to take the place of leather shoes for rough wear. The tremendous advance in the latter favors the exploitation of such footwear, which is made with brown or black duck uppers and rubber or fiber soles. As these cost, net, around $2.25 to $2.75, while leather upper and leather-soled shoes of similar style and wearing quality range from $3.50 to $5 per pair, wholesale, there is no doubt that the already large demand for these workingmen's shoes, made in rubber shoe factories, will have a heavily increased sale the coming season.

Rubber Tariffs of South America.

Exports of manufactured rubber goods from the United States to South American countries, were $5,295,962 for 1918, and, while they no longer show the phenomenal annual increases of the last four years, have at least held their own with $5,522,453, the figures of the record year 1917-1018. The data of comparison have been changed, for the official figures are now for the calendar year, whereas from 1907 to 1918 they were for the fiscal year. The record for this first calendar year, 1918, therefore, includes the figures for the months from January to June, which are also used in the record for the fiscal year 1917-18, of which these months constitute the second half.

The exports, which had been steadily increasing for ten years and had about trebled in that time, took a great jump in 1914-15, the second year of the war, rising from nearly $800,000 to over $2,400,000; the following year added $2,000,000 more and the year after another million. The increase exports were almost wholly of tires and of belting, hose and packing. The former, amounting to $62,800 in 1910-11 had risen to $264,465, in 1914-15; this became $1,344,314 in 1915-16, $2,819,499 in 1916-17, $3,762,687 in 1917-18, and stands at $3,672,606 in the calendar year, January to December, 1918.

So with belting, hose and packing which stood at a little less than the annual average in 1914-15 with $205,223; it rose to $402,753 in 1915-16, nearly double, to $678,441 in 1916-17, to $969,669 in 1917-18, again doubling the exports of two years before, and remains at $942,488 in the calendar year 1918.

Exports of boots and shoes were irregular with a strong tendency to decline; the number of pairs, 59,149, is, with one exception, the smallest exported in a dozen years, while the value $55,829 is also below the average. Druggists' sundries appear for the first time in the list with $136,611 for the fiscal year 1917-18 and $112,809 for the calendar year 1918. In both years they should be added for the purposes of comparison to "other manufactures of rubber" with which they were classified before. This will diminish the great apparent falling off in that class, by making the total for "other manufactures" $722,708 in 1917-18 and $619,089 in 1918.

Looking at the individual countries it will be noticed that Argentina with $1,429,647 worth is our best customer for automobile tires, with Chile a good second with $951,102, followed by Brazil $389,822, Uruguay $213,290, Peru $205,887 and Venezuela $136,881. Chile buys most belting, hose and packing, to the value of $389,694, Brazil comes next with $197,360, Argentina third with $163,077 and Peru fourth with $82,348. The A B C countries are also the best customers for boots and shoes, druggists' supplies and other manufacturers.

The order in total purchases of rubber goods is: Argentina $1,889,401, Chile $1,572,766, Brazil $735,167, Peru $323,077, Uruguay $266,947, Venezuela $178,980, Colombia $97,841; French Guiana with $116 tails the list.

UNITED STATES EXPORTS OF RUBBER GOODS TO SOUTH AMERICA—1908-1918.

Exported to—	Belting, Hose and Packing. Value.	Boots. Pairs.	Boots. Value.	Shoes. Pairs.	Shoes. Value.	Druggists' Rubber Sundries Value.	Tires. Automobile. Value.	Tires. All Other. Value.	All Other Manufactures of Rubber. Value.	Total Values.
South America:										
Argentina	$163,077	2	$8	7,706	$6,181	$35,425	$1,429,647	$89,519	$165,544	$1,889,401
Bolivia	43,595	....	....	36	21	[illegible]	31,678	411	2,381	[illegible]
Brazil	197,360	148	901	20,607	15,339	27,656	389,822	8,115	95,974	735,167
Chile	389,694	1,628	7,739	13,521	11,729	26,338	951,102	43,809	142,355	1,572,766
Colombia	20,578	12	38	1,443	1,254	1,941	49,630	7,374	17,026	97,841
Ecuador	8,292	....	....	1,648	1,626	3,005	47,379	592	6,296	[illegible]
Falkland Islands	2,400	....	....	....	....	....	....	....	....	[illegible]
Guiana—										
British	2,599	18	57	7,883	5,588	1,792	56,451	1,690	6,165	[illegible]
Dutch	1,327	3	7	192	143	415	3,776	829	1,532	[illegible]
French	41	....	....	....	....	....	75	....	....	116
Paraguay	730	....	....	....	....	21	264	....	515	1,530
Peru	82,348	289	977	1,073	1,192	4,621	205,887	1,495	26,557	323,077
Uruguay	28,036	24	80	2,400	2,004	3,913	213,290	101	19,523	266,947
Venezuela	8,411	72	312	544	633	7,592	136,881	2,789	22,362	178,980
†Totals, South America...	$948,488	2,096	$10,119	57,053	$45,710	$112,809	$3,515,882	$156,724	$506,230	$5,295,962
Fiscal year 1917-1918	$969,669	2,767	$13,712	72,785	$53,677	$136,611	$3,432,181	$330,506	$586,097	$5,522,453
Fiscal year 1916-1917	678,441	5,611	21,785	84,154	50,723	....	2,596,936	222,563	893,235	4,463,683
Fiscal year 1915-1916	402,732	6,258	16,333	75,838	40,461	....	1,050,398	293,916	616,891	2,420,731
Fiscal year 1914-1915	205,223	2,154	7,800	56,045	29,750	....	214,068	50,397	230,138	795,575
Fiscal year 1913-1914	226,122	2,908	10,306	65,781	37,251	....	115,387	61,943	184,462	635,471
Fiscal year 1912-1913	216,390	3,952	15,993	170,471	100,196	....	100,065	101,440	231,625	765,709
Fiscal year 1911-1912	187,643	*116,911	*81,540	....	....	....	46,618	49,820	235,013	600,634
Fiscal year 1910-1911	148,715	*114,494	*81,792	....	....	....	18,768	44,032	209,608	502,915
Fiscal year 1909-1910	150,570	*75,135	*47,761	....	....	....	....	....	212,175	410,515
Fiscal year 1908-1909	93,869	*106,543	*59,146	....	....	....	....	....	136,959	289,974
Fiscal year 1907-1908	104,974	*81,287	*48,380	....	....	....	....	....	117,949	271,303

† Calendar year 1918.
* Including shoes.

The succeeding extracts from the tariffs of the principal countries of South America are intended to show the competition to which the United States rubber manufacturers are subject under existing tariff conditions. Owing to frequent tariff changes, the figures and information given below should be periodically verified, and small trial shipments made to test the rates.

ARGENTINA.

Equivalents. Peso (gold), 96.8 cents, kilo, 2.2 pounds, g. w., gross weight.

Tariff No.		Duty per Kilo, in Pesos.
	CRUDE RUBBER, ETC.	
18.	Caoutchouc in the natural state	0.05
18.	Caoutchouc purified (*goma elastica*)	0.324
	PASTES, ETC.	
18.	Liquid rubber in any receptacle (g. w.)	0.135
	TIRES.	
18.	Tires for automobiles	0.54
18.	Tires for carriage and cart wheels	0.405
	BOOTS AND SHOES.	
18.	Boots and shoes of cloth, with caoutchouc soles:	
	For infants ... *per dozen*	2.10
	For children	2.52
	For men and women	5.04
	Of caoutchouc (*caucho*), including weight of receptacle	0.525
	Of cloth and rubber, with sole of rubber:	
	Up to 25 centimeters ... *per dozen*	1.26
	Of greater size	[illegible]
	Of rubber and felt:	
	For children	1.26
	For infants	0.63
	For women	1.68
	For men	2.10

		Duty Per Kilo, in Pesos.
	Soles and wads of rubber for boots, with or without insertion of cloth .... per kilo	0.42

DRUGGISTS' SUNDRIES.

18.	[2]Vulcanized rubber (English sheet, etc., black or red), bags, bands, cloth, bandages, teats, trusses, pumps, sponges, tube less than 5 mm. in diameter	1.35
	Urethral sounds or catheters .... each	0.027
	[2]Tube of from 5 mm. in diameter, rings for teething, syringes, etc.	0.81
	Lined or woven with cotton, linen or wool, forming bands, measures, teats, and other articles for medical uses	1.35
	The same, lined, or woven with silk or mixture thereof....	2.94
	Hard rubber in the use of canulas, syringes, and for other medical purposes	0.945
13.	Druggists' supplies of gutta percha cloth, and gutta percha for dentists	0.675
	Druggists' supplies manufactured of gutta percha........	0.54
	[2]All other articles for medical uses........ n. e. s.	1.35

OTHER GOODS.

18.	Rubber, in bands, for billiards........	0.405
	Elastic, worked into sheets, valves, belting, cords, and mats.	0.27
	The same, with cloth and metal insertions........	0.162
	Rubber in the form of horseshoes, rings, bands for saws, etc.	0.405
	Flexible tubes of rubber and asphalt, for electrical purposes.	0.0945
	Cases for guns, made of rubbered cloth........ each	0.78
	Capes of waterproof or rubber cloth, with or without hood, for men or women, and overcoats and ponchos of the same cloth .... each	2.52
	Collars of rubber........ dozen	0.54
	Leggings of rubber or waterproofed cloth........ pair	0.63
	Cuffs of rubber........ dozen pairs	0.675
	Elastic cords for physical exercises........ dozen	1.89
	Match boxes of rubber:	
	Common quality .... dozen	0.27
	Medium or fine quality .... dozen	0.81
	Erasing rubber, and rubber for cleaning razors........	0.405
	Rubber in cord, and rubber for hose or slings, and rubbers and tubes for vaporizers........	0.675
	Toys of vulcanized or elastic rubber........	0.324
	Rubber stamps, complete or not........ dozen	2.70
	Tobacco pouches of rubber........ dozen	0.27
	Braids or elastic cords with silk........	1.35
	The same, of cotton	0.81
	Boot elastics with silk........	0.81
	Boot elastics, other........	0.54
	Tubes, pipes, hose, angles and joints, of rubber, with insertion of cloth, excepting those of English sheet or its imitations	0.27
	The same, with insertions of cloth, and with or without wire	0.162
18.	Rubber balloons, with mouthpiece of wood or bone........	0.54
	Without mouthpiece	1.62
18.	Rubber cloth, such as mackintosh, silk, etc........	0.54
7.	Silk fabrics combined with rubber, known as waterproof....	1.35
5.	Rubbered cotton cloth, for hats........	0.27
5.	Waterproof, rubbered cotton tissues........	0.216
5.	Waterproof cotton tissues mixed with rubber and wool.....	....
5.	Elastic garters of cotton........ doz. pairs	0.135
5.	Belts of cotton with or without elastic........ dozen	0.405
5.	Cotton suspenders, with or without elastic........ dozen	0.54
12.	Wire or cables of copper covered with cotton, gutta percha or other materials, except lead or silk, and except all kinds of flexible cord:	
	Of wire up to 5 mm. in diameter........	0.189
	Of wire more than 5 mm. in diameter........	0.03

[2]The duty is reduced by 30 per cent if these articles are made of white vulcanized india rubber.

BOLIVIA.

Equivalents—Boliviano, 0.40 cents; kilo, 2.2 pounds; g. w., gross weight.

Tariff No.	CRUDE RUBBER, ETC.	Valuation. Bolivianos.	Per-centage Payable.
1586.	India rubber, unwrought (g. w.) .... kilo	4.00	30
1638.	Gutta percha, unwrought (g. w.)........ kilo	4.00	30
	PASTES, ETC.		
840.	Liquid rubber cement, including packing...... kilo	1.60	30
	BELTING, HOSE AND PACKING.		
985.	All kinds of machinery, belting .... kilo	3.00	Free
1986.	Hose of rubber, with or without cloth or common metal (g. w.) .... kilo	1.50	25
1989.	Rubber tubes for irrigators, nasal douches, syringes, etc., including packing........ kilo	12.00	30
1204.	Steam packing, for machines (g. w.) .... kilo	0.50	Free
	BOOTS AND SHOES.		
579.	Rubber top boots for men .... dozen pairs	36.00	45
595.	Rubber shoes, with or without waterproof lining, including packing .... kilo	3.20	40
596.	With woolen or other covering, lined or unlined, including packing .... kilo	5.00	40
597.	Roller skates and shoes with rubber soles, for games (including packing)........ kilo	6.00	40
598.	Bath shoes, with metal or rubber soles..doz. pairs	1[illegible]	40
2401.	Gutta percha heels, for boots and shoes, including packing .... kilo	6.00	30
	DRUGGISTS' SUNDRIES.		
1590.	Dental rubber and gutta percha, including packing, kilo	10.00	30
2647.	Suspensory bandages, linen or cotton, with or without rubber, including packing........ kilo	5.00	30
2641.	Probes and catheters, including packing...... kilo	8.00	15
1807.	Syringes of rubber........ kilo	7.00	30
1808.	Of hard rubber or gutta percha........ kilo	6.00	30
25[illegible].	Nipples of rubber, including packing........ kilo	8.00	30
165.	Teething rings, including packing........ kilo	5.00	30
1587.	India rubber tubes, sheets or the like, combined or not with tissue or common metal (g. w.)...kilo	2.00	30
1659.	Gutta percha sheets (g. w.)........ kilo	6.00	30
1489.	Rubbered cotton fabrics........ kilo	4.00	30
846.	Braids and cords, interwoven with rubber, including packing .... kilo	6.50	30
855b.	Woolen braids and cords, interwoven with rubber, including packing........ kilo	7.50	30
865.	Fabric of silk and rubber........ kilo	20.00	35
871.	Belts, cotton, with rubber........ kilo	5.00	40
2444.	Waterproof coats of all kinds (g. w.)........ kilo	8.00	40
[illegible]600.	Dress shields, including packing .... kilo	6.00	30
[illegible]602.	Dress shields of rubber with silk fabric (g. w.)..kilo	14.00	30
2584.	Rubber stamps, for ink, with or without pad..doz.	20.00	30
2585.	Stamps for dating........ doz.	30.00	30
2587.	Stamps for sealing, with wood or bone handle..doz.	12.00	25
2588.	Same with ivory or mother of pearl handle...doz.	60.00	25
2589.	Stamps for dating, finished or unfinished.....doz.	48.00	25
2590.	Automatic dating and numbering stamps......each	25.00	25
1588.	Erasers, including packing........ kilo	3.50	30
1589.	Erasers, with wooden or common metal sheath, including packing .... kilo	7.00	30
1830.	Toys, with or without pieces of other material, including packing .... kilo	4.00	30
1085.	Collars and cuffs........ kilo	8.00	30
739.	Rubber pads, for writing desks, including packing .... kilo	2.50	30

According to the law of December 1, 1911, duty-free and exempted goods shall be subject to 2 per cent of their tariff valuation.

Duty-free goods which are cleared "according to appraisement" shall be deemed liable to 30 per cent *ad valorem* in accordance with Article 1 of the Act dated December 31, 1905, and the net tax referred to in this article shall be reckoned on said 30 per cent.

The following alone shall be exempted from duty: goods introduced for the different departments of the State, subject to the previous authority of the Ministry of Finance; goods intended for the personal use of members of foreign legations; goods imported by railway concerns under existing contracts; material destined for the undertaking named *Luz y Fuerza Cochabamba;* goods which may be expressly free under international treaties; plant for the match factory; articles for hospitals and benevolent asylums, also materials for public works imported by the municipalities; accessories imported by educational establishments.

By an ordinance of May 2, 1913, a tax of 8 per cent is levied on fine Pará or Mollendo exported through the custom houses of La Paz, Oruro, Yacuiba, Puerto Suarez, San Matias, Cobija and Abuna, as well as on sernamby. Fine Pará, the lower grades of rubber and sernamby passing through the custom houses of Villa-Bella and Guayaramerin are dutiable at the rate of 10 per cent.

As the valuation of this rubber depends on the fluctuations of prices in London, the tax is not levied in a uniform manner. From time to time London prices are taken for fixing official valuation upon which the percentage is calculated, after expenses of production have been deducted.

[3]The preceding regulations refer to footwear exceeding 20 cm. sole. From 15 to 20 cm. sole is appraised with a rebate of 50 per cent; up to 15 cm. inclusive, with a rebate of 75 per cent.

BRAZIL.

Equivalents—Milreis (1,000 Reis, gold) 54.6 cents; paper, 32.4 cents; kilo, 2.2 pounds.

Tariff No.	BELTING, HOSE AND PACKING.	Duty Per Kilo, in Reis.	Ad Valorem Duties. Per Cent.	Tare Allowance. Per Cent.
995.	Machine belting of cotton and rubber.	1.800	30	5
1035.	Hose, threads, leaves or sheets.......	1.200	50	..
1035.	Machine packing	1.000	50	..
	BOOTS AND SHOES.			
1033.	Footwear	3.000	50	..
810.	Pneumatic tires and inner tubes, made of Brazilian rubber, fine Pará......	....	5	Net
	The same, of other rubber.......	....	50	Net
1033.	Solid tires, made of Brazilian rubber, fine Pará	100	50	..
	The same, of other rubber.......	10.000	50	..
	DRUGGISTS' SUNDRIES.			
903.	Nipples, complete, with capsule and tube .... dozen	1.000	15	(4)
	Nipples alone .... dozen	200	15	(4)
907.	Elastic stockings of linen or cotton, dozen	6,000	15	(4)
	Of silk .... dozen	16,000	14	(4)
915.	Syringes and irrigators of hard rubber	3,200	15	(4)
917.	Speculums of hard rubber...........	3.200	15	(4)
927.	Cupping-glasses of rubber and glass, dozen	2.000	15	(4)
928.	Other surgical goods of rubber.......	10.000	15	(4)
	OTHER GOODS.			
617.	Tissues, rubbers, packings and washers of asbestos fabric combined or not with wire or a composition of rubber or talc	1.100	20	Hogsheads or cases 5
	Paper and cardboard in sheets or cut in any shop for whatever use, combined or not with rubber, wire, or in pulp admixture of another material.......	500	20	Hogsheads or cases 5
688.	Wire, in cords, strings, cables, cordage and other wares:			
	Covered with paper, cotton, rubber, or other composition.............	900	30	Hogsheads 10 Cases 20
	Covered with cotton and rubber, armored, for submarine or underground cables, for electric installations, etc.	....	20	Hogsheads 10 Cases 20

Tariff No.		Duty Per Kilo, in Reis.	Ad Valorem Duties. Per Cent.	Tare Allowance. Per Cent.
795.	Office erasers with handles of bone, wood, horn or common metal *dozen*	2.400	50	(4)
	Manufactures of rubber, celluloid, and gutta percha, vulcanized or not:			
1033.	Pots and other articles for domestic use, funnels, capsules and bottles	2.600	50	(4)
	Sticks, whips and similar articles....	5.000	50	(4)
	Tobacco pouches, tips of walking sticks and match box covers......	4 000	50	(4)
	Dolls, toys and similar articles......	3,500	50	(4)
	Buttons of all kinds...............	4.000	50	(4)
	Combs, rulers and penholders.	4.000	50	(4)
	Belts, braces, garters, cords, ribbons and braids, covered with pure or mixed silk	30.000	50	(4)
	The same, covered with any other material	7 000	50	(4)
	Preparation or composition for dentists	3.200	50	(4)
	Jewelry	10.000	50	(4)
	Stems and tubes for flowers	7.000	50	(4)
	Rubber combined with cotton, wool or linen:			
	In the piece or in cuttings........	4 000	50	(4)
	In articles not specially mentioned.	7.000	50	(4)
	Rubber combined with pure or mixed silk fabrics:			
	In the piece or in cuttings	7.000	50	(4)
	In articles not specially mentioned.	15.000	50	(4)
	Door mats	1.300	50	(4)
	Coverings for floors, stairs, etc.:			
	Made of fine Pará......	100	50	(4)
	Made of other rubber.......... .	10.000	50	(4)
	Articles not specially mentioned.....	....	50	(4)

Machine belting, rubber or asbestos laces, and flax, cotton or hemp cords for transmission apparatus used for the improved manufacture of sugar and for the erection or improvement of central stations, when directly imported by agriculturists or enterprises are affected by article 424 of the Consolidated Customs Law.

The following articles, when imported by agriculturists, agricultural syndicates, navigation and railway companies, or by undertakings and works engaged in the manufacture of faience ware, fine stoneware and chinaware, or of glazed flooring tiles, in the manner, and with the restrictions provided for in Decree No. 8592, of March 8, 1911, shall pay duties set forth below:

		Reis Per Kilo.
617.	Tissues, ribbons, machine packing and washers of tissue, combined or not with wire or with a composition of rubber or talc.	150
	Combined or not with rubber with or without wire, and in pulp with an admixture of another material..............	100
995.	Machine belting of cotton, linen, wool or rubber...........	200
1033.	Machine packing	160

Decree No. 9323, of January 27, 1912, provides a rebate of 20 per cent on rubber manufactures, mentioned in tariff No. 1033, imported from the United States.

All manufactures duly certified to be made of fine Pará rubber are to pay 5 per cent of the ordinary tariff rates of duty (or 10 per cent in the case of electric cables insulated with rubber). Tires not made of fine Pará are to pay 15 per cent ad valorem except tires destined for motor lorries, which are to continue paying 5 per cent ad valorem.

Surgical instruments and apparatus, and apparatus required for medical treatment and with disinfectants, are entitled to a rebate of 90 per cent of the tariff rates, if such goods are destined for charitable and public free relief establishments.

Customs duties payable in gold, hitherto calculated on the value of goods at the rate of exchange of 12 pence (24 cents) per 1.000 reis, are at present assessed at the rate of exchange of 16-5/16 pence (32⅝ cents).

[4]Articles packed in cases or boxes of cardboard are rated on their gross weight.

COLOMBIA.

Equivalents—Gold dollar, 96 cents; kilo, 2.2 pounds.

CRUDE RUBBER, ETC.

Tariff No.		Duty Per Kilo in Dollars.
390.	Crude rubber, purified or not.........................	$0.30
391.	Unmanufactured gutta percha..........................	0.30

PASTES, ETC.

406.	Rubber solution	0.25

BELTING HOSE AND PACKING.

392.	Driving straps or belts......................................	0.01
400.	Hose pipes	0.01
381.	Rings, washers, joints, collars, stops or stop pieces, and other accessories for machines, motor vehicles and bicycles, and the unmachined material for manufacturing these articles	0.20
389.	Footwear of rubber (*zapatones*)............................	1.00

BOOTS AND SHOES.

1581.	Cotton footwear with soles of rubber, leather, etc......	1.50
1615.	Linen footwear with soles of rubber, leather, etc.........	1.70
407.	Rubber soles and heels.....................................	0.35
402.	Elastic sides for footwear..................................	0.50

TIRES.

Tariff No.		Duty Per Kilo in Dollars.
399.	Tires either cut or in sections for cutting..	0.02
851.	Solid or pneumatic tires for all kinds of vehicles........	0.02

DRUGGISTS' SUNDRIES.

587.	Sponges of rubber, lined or not..........................	1.00
691.	Babies' rings or comforters of any kind..................	0.10
710.	Canulas of rubber, bone or glass, for syringes............	0.25
711.	Rubber capsules for bottles.............................	0.25
718.	Rubber tissue for surgical uses or for invalids, in the form of ice and hot water receptacles, abdominal belts, feeding bottles, rupture trusses, urinals, balls or pumps, in tubes less than 8 centimeters in diameter, nasal tubes, and in general, rubber tissue in any form for medical use......	0.25
719.	Teething rings of any kind................................	0.25
720.	Small glass or rubber vessels, and respiratory apparatus..	0.25
726.	Suckers and feeding bottles..	0.25
736.	Abdominal belts of any kind, not specially mentioned.....	0.25
743	Rubber gloves, for surgical or industrial purpose........	0.25
747.	Rubber sprinklers	0.25
755.	Elastic stockings and bands......	0.25
765.	Nipple shields of glass with or without pump and tube of rubber	0.10
771.	Compression, rubber pump or embolus atomizers.........	0.25
773.	Breast pumps of any kind.	0.25
778.	Rubber stoppers for receptacles.........................	0.10
784.	Rubber tubes for sprinklers...	0.25

OTHER GOODS.

380.	Rubber floor cloth and mats............................	0.35
382.	Rings for fastening parcels.............................	0.20
391.	Vulcanized rubber for mounting artificial teeth..........	1.30
393.	Knives, forks, utensils and instruments with handles of rubber, celluloid or gutta percha.........................	0.60
395.	Rubber cord for catapults or slings......................	5.00
397.	Toys, not covered or dressed............................	0.60
398.	Toys, covered or dressed................................	1.50
401.	Combs and braid combs.............	1.00
403.	Articles of clothing made from unmachined rubber cloth..	1.00
404.	Life belts	0.10
405.	Stamps	1.50
408.	Plugs and stoppers..	0.10
409.	[4a]Rubber carpets and cloth for flooring..................	.050
410.	[4a]Tiles and cloth for roofing and for boats...............	0.01
412.	Thick rubber cotton cloth, suitable for riding trousers....	0.90
413.	Thin rubbered cotton cloth, suitable for traveling coats and articles of clothing..	1.10
414.	Rubbered woolen cloth..................................	1.50
415.	Unmachined cloth, for surgical and dental purposes.....	0.35
416.	Tubes and pipes.........	0.05
789.	Insulators of rubber, and other materials, not specified...	0.03
795.	Metal wires, not specified, and metal cables protected with gutta percha, tar, etc	0.01
802.	Rubber bands for insulators and other material used for insulating, not specially mentioned.....................	0 02
937.	Disinfecting and fire-extinguishing apparatus and accessories, such as hose pipes of rubber, canvas, etc., imported with such apparatus	Free
951.	Suspension baths, with body of iron or tinplate, rubber tube, brush and dish of rubbered tissue................	0 20
1241.	Erasers	0.15
1242.	Hand stamps	0.17
1465.	Traveling cloaks or ponchos of rubberized cotton........	1.00
1546.	Wool and elastic waist-bands, with clasps...............	1.60
1573.	Wool and elastic garters, with clasps	1.60
1591.	Traveling cloaks or ponchos of rubbered wool..........	1.60
1592.	Overcoats and clothing of rubbered wool................	1.80
1598.	Rubbered woolen fabric, not specified..................	1.50
1600.	Suspenders of wool and elastic, with clasps............	1.60
1601.	Strips or bands of wool, for belts, garters or suspenders, rubbered or not..........	1.50
1678.	Linen and elastic material for footwear................	0 55
1689.	Clothing of rubbered linen..	1.20
1691.	Traveling cloaks and ponchos of rubbered linen.........	1.20
1737.	Rubbered linen fabric, not specified....................	1.10
1757	Rubbered silk fabric, not specified....	2.00
1763.	Silk and elastic suspenders, including clasps...	3.00
1764.	Elastic silk strips for belts, garters or suspenders	2.50
1765.	Clothing of rubbered silk.	2.50
383.	Manufactured articles of rubber or gutta percha, not specified	1.00

[4a]Cloths for flooring and boats will not be considered as such when weighing less than two kilos per superficial square meter.

CHILE.

Equivalents Gold peso, 36 cents (about); kilo, 2.2 pounds; g. w., gross weight; l. w., legal weight.

CRUDE RUBBER, ETC.

Tariff No.		Duty Per Kilo in Pesos.
179.	Crude rubber, gutta percha or balata (g. w.)............	0.04
183.	Rubber waste (g. w.)....................................	0.12

PASTES, ETC.

184.	Rubber solution (l. w.).................................	0.60

BELTING, HOSE, AND PACKING.

1561.	All kinds of machinery belting (l. w.)..................	0.25
528.	Asbestos and rubber packing (g. w.)....................	0.35
208.	Tubes or hose-piping of rubber (g. w.).................	.040

BOOTS AND SHOES.

225.	Boots and shoes and all classes of footwear of rubber, with or without pieces of other material, including also those which have only rubber soles (kilo net)..	2.00

DRUGGISTS' SUNDRIES.

Tariff No.		Duty per Kilo in Pesos.
	Abdominal bands, bandages or belts (l. w.)—	
1232.	Of cotton and rubber	4.00
1233.	Of wool and rubber	6.00
1234.	Of silk and rubber	22.00
1275.	Refined gutta percha (l. w.)	4.50
1278.	Drop-counters of rubber and glass (l. w.)	1.50
1301.	Nursing bottles with rubber parts (l. w.)	0.40
1306.	Elastic stockings and similar articles (l. w.)—	
	Of silk	16.00
	Other kinds	6.00
1326.	Nipples and nipple shields with rubber parts (l. w.)	1.20
1227.	Other surgical goods:	
	Of rubber or rubbered fabric (l. w.)	2.50
	Of hard or vulcanized rubber (l. w.)	1.50

OTHER GOODS.

Tariff No.		Duty per Kilo in Pesos.
180.	Rubber sheets (g. w.)	0.20
181.	Rubber combined with cloth or metal (g. w.)	0.36
182.	Rubber, vulcanized, in sheets (g. w.)	1.20
185.	Plugs, stoppers and rings for use in packing preserves (l. w.)	0.60
	Elastic of rubber and cotton (l. w.)—	
756.	More than 12 centimeters wide	0.60
757.	Up to 12 centimeters wide	1.80
772.	Garters, braces, suspenders of cotton and rubber (l. w.)	3.50
811.	Clothing of rubbered cotton (kilo net)	6.00
	Elastic of rubber and linen (l. w.)—	
848.	More than 12 centimeters wide	0.60
849.	Up to 12 centimeters wide	1.80
859.	Linen and rubber garters, braces, suspenders (l. w.)	4.00
874.	Dress shields of rubbered linen (l. w.)	2.40
901.	Rubbered woolen cloth (kilo net)	0.50
	Elastic of rubber and wool (l. w.)—	
935.	More than 12 centimeters wide	0.60
936.	Up to 12 centimeters wide	3.00
945.	Wool and rubber garters, braces, suspenders (l. w.)	4.00
956.	Dress shields of rubbered wool (l. w.)	2.40
965.	Clothing of rubbered wool (kilo net)	7.00
977.	Rubbered silk waterproof cloth (kilo net)	1.50
	Elastic of rubber and silk (l. w.), more—	
1011.	Than 12 centimeters wide	1.00
1012.	Up to 12 centimeters wide	8.00
1021.	Garters, braces, suspenders of silk and rubber (l.w.)	14.00
1045.	Dress shields of rubbered silk (l. w.)	6.00
1058.	Waterproof clothing of rubbered silk (kilo net)	12.00
1720.	Rubber-insulated wire (g. w.)	0.10
1764.	Rubber toys (l. w.)	2.50
1779.	Balls for tennis, football, etc. (l. w.)	3.00
200.	Rubber goods, not specified (l. w.)	0.75

The importation of plants, seeds, roots, etc., is permitted only after a certificate, attesting to the freedom of the goods from disease, has been issued by the office charged with the sanitary inspection of vegetable products.

By net weight is understood the weight of the goods deprived of all coverings, or the weight of the goods which are without packings and are cleared merely fastened together.

By legal weight is understood the weight of goods with all their receptacles (including fastenings), with which they are packed inside external wrapping serving as a general receptacle, but excluding straw, chips, paper, sawdust and other materials used for the disposal of packets.

By gross weight is understood the weight of the goods with all their packings and wrappings, inside and outside.

ECUADOR.

Equivalents Lucre, 44 cents; kilo, 2.2 pounds; g. w., gross weight; n. w., net weight.

Class No.		Duty Per Kilo in Lucres.
2.	Rubber belting	Free
7.	Rubbered (g. w.)	0.04½
12.	Waterproof tents and covers (g. w.)	0.11½
12.	Wire ropes and cables (g. w.)	0.11½
17.	Worked india rubber, for floor covering, prepared and painted (g. w.)	.0.22½
21.	Hose (g. w.)	0.34
25.	Rubber tires (n. w.)	0.45
27.	Waterproof cloth (g. w.)	0.56½
28.	Engine packings (n. w.)	0.57
32.	Manufactures of rubber not elsewhere specified (n. w.)	0.68
32.	Garters, other silk (n. w.)	0.68
32.	India rubber tubes (n. w.)	0.68
33.	Erasers (n. w.)	0.90
33.	Stamp rubber (n. w.)	0.90
37.	Waterproof cloaks and other waterproof clothing (n. w.)	1.13
38.	Rubber sponges (n. w.)	1.36
38.	Rubber boots, leggings and shoes (n. w.)	1.36
38.	Rubber balls for carnival (n. w.)	1.36
38.	Rubber gloves (n. w.)	1.36
38.	Rubber or metal stamps and apparatus and cases for keeping and inking them (n. w.)	1.36
47.	Elastic bands of imitation silk vegetable fiber (n. w.)	3.39
49.	Billiard balls of composition, gutta percha or celluloid (n. w.)	4.51
52.	Silk garters and braces (n. w.)	7.90
55.	Rubber preservatives (n. w.)	11.28

PARAGUAY.

Equivalents—Peso, 96 cents; kilo, 2.2 pounds; g. w., gross weight; n. w., net weight.

CRUDE RUBBER, ETC.

Tariff No.		Valuation. Pesos.	Duties. Per Cent.
2083.	Rubber, in the natural state ... kilo	1.00	35
2084.	Refined or elastic gum ... kilo	1.50	35

PASTES.

Tariff No.		Valuation. Pesos.	Duties. Per Cent.
3157.	Rubber liquid, in any receptacle ... kilo	0.50	35

BELTING, HOSE AND PACKING.

Tariff No.		Valuation. Pesos.	Duties. Per Cent.
975.	Belting of hemp, cotton or other fiber, combined or not with rubber or gutta percha ... kilo	0.60	35
1086.	Rubber belts, plates, valves ... kilo	1.20	35
1087.	Rubber belts, plates, valves, with insertions of cloth or metal ... kilo	0.80	35
889.	Pipes, tubes, hose, elbows or joints of rubber, or English sheet ... kilo	1.00	35
890.	The same with insertions of cloth, with or without wire ... kilo	0.60	35
891.	The same of rubber, in strips special for the manufacture of match boxes ... kilo	1.50	35
1025.	Packings of all kinds not enumerated ... kilo	0.45	35

BOOTS AND SHOES.[5]

Tariff No.		Valuation. Pesos.	Duties. Per Cent.
375.	Boots and shoes (all sizes) of felt called de cremea with elastic ... dozen pairs	6.00	55
378.	Boots and shoes of cloth, with sales of rubber or other materials, for infants ... dozen pairs	5.00	55
379.	The same, for children ... dozen pairs	6.00	55
380.	The same, for men and women ... dozen pairs	12.00	55
382.	Boots and shoes of rubber, including top boots, weighed together with the packing ... kilo	1.25	55
383.	Of cloth and rubber, with soles of rubber, up to 25 centimeters long ... dozen pairs	3.00	55
384.	The same, larger sizes ... dozen pairs	7.00	55
396.	Soles and heels of rubber, with or without insertions of fabric ... kilo	1.00	35
409.	Elastics for footwear, with silk ... kilo	3.50	40
410.	Elastics for footwear, without silk ... kilo	2.00	35

TIRES.

Tariff No.		Valuation. Pesos.	Duties. Per Cent.
1088.	Rubber in the shape of tires for carriage or cart wheels ... kilo	1.50	35
1089.	Tire for automobiles ... kilo	2.00	35

DRUGGISTS' SUNDRIES.[6]

Tariff No.		Valuation. Pesos.	Duties. Per Cent.
2085.	Vulcanized rubber (English sheet and the like, black or red), bags, belts, cloth, bands, nursing nipples, tires—single or double pairs for pulverizers, sponges, tubes of less than 5 millimeters in diameter and any other article for medical purposes, not elsewhere specified ... kilo	5.00	35
2086.	Probes, urethral ... each	0.10	35
2087.	Tubes of 5 millimeters in diameter and over, stoppers, teething rings, syringes, etc ... kilo	3.00	35
2088.	Elastic belts, stockings, bandages and similar articles for medicinal use ... kilo	5.00	35
2089.	The same, of pure or mixed silk and rubber ... kilo	7.00	40
2090.	Rubber on tissue, such as mackintosh, silk, etc. .kilo	2.00	35
2091.	Ebonite, and the like, canulas, syringes, pessaries, or any other article for medical use ... kilo	3.50	35
2733.	Elastic belts or bands ... each	1.50	35
2809.	Nipple shields with rubber pump ... each	0.30	35
2833.	Pulverizers, vapor, with or without rubber bulb. .dozen	8.00	35
2835.	Breast pumps, with rubber pumps, mounted or not, each	0.40	35
2836.	The same, with rubber tube ... each	0.20	35
2868.	Cupping glasses with rubber pump ... each	0.30	35

DRUGGISTS' SUNDRIES.[6]

Tariff No.		Valuation. Pesos.	Duties. Per Cent.
1085.	Rubber billiard cushion ... kilo	1.50	35
1086.	Cords and foot wipers ... kilo	1.20	35
1087.	The same, with insertions of metal or cloth ... kilo	0.80	35
1088.	In the shape of horseshoes, rings, bands for cutting up, etc. ... kilo	1.50	35
1539.	Wire or cables of copper up to 5 millimeters in diameter, covered with cotton, gutta percha or other material except lead, silk or any kind of flexible cords ... kilo	0.70	35
1540.	The same, over 5 millimeters in diameter ... kilo	0.60	35
1541.	The same, up to 5 millimeters in diameter, coated with lead ... kilo	0.50	35
1542.	The same, over 5 millimeters ... kilo	0.50	35
1543.	The same, any diameter, covered with silk ... kilo	2.50	40
1546.	Wire or cables of iron or steel covered with cotton, gutta percha or other material ... kilo	0.30	35
1570.	Insulating tapes of rubber ... kilo	1.60	35
1576.	Ebonite in plates, tubes or rods ... kilo	1.20	35
2945.	Dress preservers of rubber or waterproof cloth, without silk ... kilo	3.00	35
2946.	The same, with silk ... kilo	3.50	40
3153.	Balloons of rubber, with mouthpiece of wood or bone ... kilo	2.00	35
3154.	The same without mouthpiece ... kilo	6.00	35
3155.	Erasers and razor wipers of rubber, also elastic bands for match boxes ... kilo	1.50	35
3156.	Rubber cord and elastic bands for papers, sleeves, slings; rubber accessories and tubes for vaporizers, kilo	2.50	35
3207.	Toys of vulcanized rubber or elastic gum ... kilo	1.50	35
3229.	Garters, elastic: of cotton ... dozen pairs	0.50	35
3231.	Of pure or mixed silk ... dozen pairs	2.00	40
3232.	The same, fine, including garters in pairs, put up in boxes ... dozen pairs	4.00	40
3267.	Wares of vulcanized rubber or elastic gum, not specified ... kilo	1.50	35
3353.	Fountain pens ... dozen	5.00	35
3393.	Tobacco pouches of rubber or leather, all kinds. .dozen	1.50	35
3435.	Galloons of silk elastic ... kilo	5.00	40
3436.	Galloons of cotton elastic ... kilo	3.00	35
3709.	Cotton fabric, with rubber, waterproof ... kilo	0.80	35
3710.	The same, combined with wool and rubber ... kilo	2.00	35
3739.	Woolen fabrics with rubber ... kilo	3.00	35
3740.	Woolen fabrics combined with cotton and rubber. .kilo	2.50	35
3740.	Silk fabrics with rubber ... kilo	5.00	40

[5] Infants' shoes will be regarded as those up to 16 centimeter long; children's, over 16 and up to 25 centimeters, exclusive; women's, over 23 centimeters; men's, over 25 centimeters.

[6] Articles referred to under Nos. 2085 and 2087, if of white rubber, will be valued with a rebate of 30 per cent, according to kind.

Tariff No.		Valuation Pesos	Duties Per Cent.
3509.	Garments made of waterproof cotton fabrics....*kilo*	1.00	55
3510.	Of waterproof woolen fabrics..........*kilo*	2.00	55
3511.	Of waterproof silk fabric...........*kilo*	4.00	55

PERU.

Equivalents—Gold libra (£), $4.86. (A gold libra is divided into 10 sols; 1 sol = 100 centavos.) Kilo, 2.2 pounds; l. w., legal weight; n. w., net weight; g. w., gross weight.

Tariff No.	PASTES.	Duties Per Kilo. £.	S.	C.
2545.	Liquid Rubber (l. w.)........................	0	1	40

BELTING, HOSE AND PACKING.

1768.	Hose not elsewhere specified (g. w.)............	0	0	40
2178.	Hose of wired rubber, exceeding 10 millimeters in diameter, for draining mines, g. w. per 100 kilos..	Free		
2206.	Packing, of rubber, in round or cut out pieces, in rings, washers or other special forms..............	Free		
2269.	Transmission belts of rubber	Free		

BOOTS AND SHOES.

630.	Footwear of rubber, or with only sole of rubber, with or without other material (l. w.)...............	0	1	35
1703.	Rubber insoles (l. w.)...........................	0	1	50

TIRES.

1765.	Bicycle tires (l. w.)..........................	0	1	50
1767.	Automobile tires (g. w.)........................	0	1	00

DRUGGISTS SUNDRIES.

1763.	Teething rings, bands for tooth or nail brushes, tubes for irrigators or nursing bottles (l. w.)...........	0	1	50
1764.	Buckets, bed-pans, troughs, funnels, urinals and similar articles of hard or vulcanized rubber (l. w.)..	0	1	20
3297.	Probes, rubber or tin, dozen........................	0	1	20
3302.	Air pillows, cushions and beds, of soft rubber, with or without admixture..........................	0	2	00
3317.	Abdominal bandages or belts, elastic or not, of cotton, linen or rubber, each..........................	0	1	20
3318.	Woolen belts, with or without rubber...........*each*	0	6	00
3323.	Stomach pumps	..	..	..
3325.	Bottles of gutta percha, for acids..................	0	4	00
3335.	Canules, of hard rubber, in any form..............	0	2	80
3344.	Ear tubes of bronze, brass or rubber, dozen........	0	4	80
3348.	Root cutters and compressors of rubber, each......	0	1	60
3351.	Finger cots, of soft rubber (l. w.)..	0	2	80
3352.	Pouches, ear, nose, eye and the like	0	2	00
3367.	Rubber prepared for dentists......................	0	6	00
3369.	Rubber gloves (l. w.).............................	0	2	80
3375.	Syringes, of aluminum and of hard or soft rubber, including irrigators solely of that material, and those called "*peras*" (pear) (l. w.)...............	0	2	00
3384.	Elastic stockings of cotton or other vegetable fiber..	0	2	80
3385.	The same, of silk........	0	8	00
3391.	Nipples for nursing bottles (l. w.).................	0	2	80
3392.	The same, with ring, whistle or bells (l. w.)........	0	2	00
3415.	Bands of elastic gum, of m. 2 by m. 0.06, dozen....	0	3	00
3418.	Cupping glasses of glass with rubber globe, dozen..	0	4	00

OTHER GOODS.

50.	Cotton tissues, waterproofed with rubber, for floors and for industrial purposes..........	0	0	50
51.	The same, for sheets or wearing apparel............	0	0	75
176.	Garters of all kinds, l. w..........................	0	2	00
209.	Dress protectors, cotton, with or without rubber, l. w.	0	6	00
225.	Waterproof clothing, cotton, common, for sailors (l. w.)	0	1	35
226.	Other kinds, of any shape (l. w.)....................	0	2	25
268.	Woolen elastic for footwear, belts, braces or other purposes (l. w.)................................	0	1	60
373.	Woolen garters of all kinds (l. w.).................	0	2	70
420.	Woolen waterproof clothing, rubbered, such as *batas*, mantles, copes, ponchas, overcoats, and others (l. w.)	0	2	25
465.	Elastic for footwear, belts, braces of, fibers other than cotton and wool................................	0	1	70
467.	Fabrics of abaca, hemp, flax, pita, jute, etc., rubbered, for floors..............................	0	0	50
468.	The same, for clothing or sheets....................	0	0	75
613.	Waterproof clothing, of the above fibers, common, for sailors	0	1	35
657.	Silk elastic for footwear, belts or braces............	0	2	00
662.	Waterproofed silk for wearing apparel or for other purposes	0	3	20
759.	Silk waterproof clothing (l. w.)....................	0	4	50
853.	Bathing caps (l. w.)........................*dozen*	0	2	70
861.	Rubber life preservers (l. w.)......................	0	0	90
1763.	Erasers, small balloons for carnival or for toys, with or without parts of other material, tobacco pouches, stoppers, and all other similar articles not specially tariffed	0	1	50
1765.	Rubber cushions for billiard tables (g. w.)..........	0	1	00
1766.	Key-hole guards, cigar and cigarette holders, cigar cases and match boxes, counters, calls and whistles, card cases and all other similar articles of hard or vulcanized rubber, including napkins rings (l. w.).	0	2	00
1770.	Rubber combs (l. w.)..............................	0	1	50
1771.	Braid combs of rubber, hair pins (l. w.)............	0	5	00
1772.	The same, ornamented with other material (l. w.)..	0	7	50
1775.	Rubber sheet, openworked or figures, for floors (g. w.)	0	0	60
1776.	Plain sheet, combined or not with tissue, cut or in pieces, for the same or other purposes (g. w.)....	0	0	40
1821.	Fountain pens ....*dozen*	0	4	00
1874.	Stamps, rubber ....*dozen*	0	2	80
1887.	Rubber type (l. w.)..............................	0	1	80

Tariff No.		Duties Per Kilo. £.	S.	C.
2454.	Wire or cables of copper, less than 3 millimeters in diameter, [illegible]	[illegible]	[illegible]	[illegible]
2455.	The same [illegible] (g. w.)	[illegible]	[illegible]	[illegible]
2460.	Wire [illegible] of iron or steel, covered with gutta percha or any other material (g. w.)	[illegible]	[illegible]	[illegible]
2474.	Ebonite [illegible] (g. w.)	[illegible]	[illegible]	[illegible]
2475.	Ebonite tubes or rods (g. w.)	[illegible]	[illegible]	[illegible]
2621.	Toys of rubber, not elsewhere specified (d. w.).....	0	1	[illegible]

India rubber [illegible] and generally, all gums exported from Peru, shall pay duty at the rate of 8 per cent ad valorem [illegible] market value at Liverpool (July 7, 1911).

URUGUAY.

Equivalents—Peso, $1.04; *kilo*, 2.2 pounds.

Tariff No.	HOSE.	Valuation	Duty Per Cent
137..	Rubber hose, with or without [illegible]	[illegible]	[illegible]

BOOTS AND SHOES.

3574.	Rubber shoes, all sizes ....*dozen pairs*	18.00	48
3578.	Clogs, with elastic, for men and women..*dozen pairs*	20.00	48
3579.	The same, for children. ....*dozen pairs*	11.00	48
3267.	Elastic, of pure or mixed silk, for boots and shoes. *meter*	0.5[illegible]	31
3268.	Of wool, wool and cotton or linen mixed, or of pure cotton, for boots and shoes............ *meter*	0.32	31

DRUGGISTS' SUNDRIES.

3501.	Air beds, of rubber.. ....*each*	[illegible]	31
3942.	Catheters, rubber ....*dozen*	1.80	31
3945.	Rubber rings ....*dozen*	0.50	31
3946.	Rubber cushions, all kinds.................*dozen*	18.00	31
3969.	Syringe pipes of rubber....................*dozen*	1.20	31
4011.	Gutta percha funnels.. ....*dozen*	2.40	31
4025.	Elastic belts ....*dozen*	18.00	31
4097.	Injectors, white rubber, assorted, in boxes of one dozen ....*dozen*	3.00	31
4098.	The same, from No. 0 to 2, inclusive.... ..*dozen*	1.5[illegible]	31
4099.	Of white rubber, in boxes of one dozen, from No. 3 to 5, inclusive. ....*dozen*	2.50	31
4100.	The same, from No. 6 and over............*dozen*	4.50	31
4101.	Of green rubber, assorted, in boxes of one dozen, *dozen*	5.00	31
4102.	The same from No. 0 to 2, inclusive........*dozen*	2.00	31
4103.	The same, from No. 3 to 6, inclusive........*dozen*	4.00	31
4104.	The same from No. 7 and larger............*dozen*	6.00	31
4184.	Rubber pessaries ....*dozen*	2.00	31
4250.	Breast pumps ....*dozen*	5.00	31
4275.	Rubber nipples ....*dozen*	0.25	31
4281.	Rubber tubes of all kinds...................*kilo*	3.00	31
4252.	Rubber tubes for irrigators.................*dozen*	4.00	31
4293.	Elastic bandages ....*kilo*	3.00	31

OTHER GOODS.

554.	Narrow elastic, of silk or silk and cotton..100 *meters*	1.00	31
545.	The same, pure cotton ....100 *meters*	0.80	31
597.	Rubber aprons, unlined.....................*dozen*	4.80	48
598.	The same, lined, bordered or not............*dozen*	8.60	48
673.	Balloons of rubber.........................*dozen*	0.25	31
674.	The same, with or without mouthpiece........*gross*	1.80	31
711.	Leggins, of silk and rubber............*dozen pairs*	20.00	31
712.	The same, of rubber or oilcloth........*dozen pairs*	8.00	31
751.	Elastics for shirtsleeves................*dozen pairs*	0.60	31
806.	Overcoats, waterproof, silk, wool, or cotton..*dozen*	48.00	48
837.	Hard rubber combs.........................*dozen*	0.40	31
844.	Small rubber combs, for holding the hair....*dozen*	0.30	31
846.	Rubber balls ....*dozen*	0.60	31
847.	Covered with leather.....................*dozen*	0.30	31
882.	Ponchos of rubber or silk, waterproof.........*each*	8.00	48
883.	Waterproof wool, or mixture of wool..........*each*	5.00	48
884.	Waterproof cotton ....*each*	3.00	48
898.	Rubber cuffs ....*dozen pairs*	1.50	31
946.	Dress preservers, of rubber and cotton..*dozen pairs*	0.60	31
947.	Of rubber and silk..................*dozen pairs*	1.00	31
976.	Waterproof tissue, coated with rubber or both, or either sides, or between two cloth surfaces, one meter wide ....*meter*	1.00	31
1006.	Elastic, silk and cotton for garters......100 *meters*	5.00	31
1007.	Cotton elastic, for garters..............100 *meters*	2.00	31
1747.	Rubber erasers, for ink.......................*kilo*	1.40	31
1748.	The same with wooden sheath; also elastic bands..*kilo*	3.00	31
1752.	Rubber threads, combined with tissue..........*kilo*	0.60	31
1753.	Rubber, in sheets, and similar articles for machinery ....*kilo*	1.30	31
3734.	Refined gutta percha.........................*kilo*	2.00	48

VENEZUELA.

Equivalents—Bolivar, $2.28-36; kilo, 2.2 pounds.

Tariff No.	CRUDE RUBBER, ETC.	Rate of Duty (Not Including Surtaxes). Per Kilo.
25.	Live plants, including rubber, for cultivation....	Free
259.	Gutta percha, manufactured or not........................	2.50

PASTES.

250.	Rubber, liquid	1.25
252.	Cement of rubber and benzine........................	1.25

BELTING.

247.	Rubber belting	0.75

Tariff No.		Rate of Duty (Not Including Surtaxes). Per Kilo.
	BOOTS AND SHOES.	
270.	Rubber shoes	2.50
	TIRES.	
247.	Tires for carriages and carts	0.75
	DRUGGISTS' SUNDRIES.	
245.	Teething rings, with or without nipples	1.25
250.	Sponges, rubber	2.50
263.	Nipples	0.25
687.	Rubber cushions for invalids; hot water and ice bags; bulb syringes; abdominal bands, bandages, irrigators, syringes of all kinds, elastic stockings, pessaries, sounds, ligatures, cupping glasses, suspensories	1.25
812.	Atomizers and perfume sprayers	1.25
	OTHER GOODS.	
246.	Portable bath tubs, rubber, and accessories	1.25
245.	Washers, rings, with core of cloth, billiard strips, horseshoe pads, and parts of coffee cleaning machines	0.75
248.	Manufactures of rubber *n. o. s.*	2.50
249.	Rubber, lined or not, for clothing	2.50
251.	Rubberized capes and raincoats	2.50
253.	Rubber bands for footwear	2.50
256.	Rubber floor mats	1.25
258.	Rubber erasers	1.25
265.	Artificial plants, of rubber	2.50
268.	Tubes, more than 15 millimeters (about 0.6 inch) in diameter	0.75
269.	Tubes, less than 15 millimeters in diameter	2.50
513.	Cords, cotton, wool or linen with admixture of rubber	5.00
542.	Waterproof fabrics of wool and rubber	2.50
590.	Waterproof cotton, cloth and rubber, for the manufacture of raincoats	1.25
630.	Garters and suspenders of all kinds	10.00
901.	Wire, insulated or not, for electrical installations.	0.25
971.	Fountain pens, with only the pen point of gold	2.50

Imports into Venezuela are dutiable on gross weight, i. e., inclusive of the weight of the containers. In case the containers consist of articles specified in the tariff under a higher tariff classification than that of the contents, they are assessed for duty under their own classification.

All dutiable imports are subject to the following surtaxes:

Two surtaxes of 12½ per cent of the duty each, authorized by the decree of April 25, 1901.

A surtax of 30 per cent of the duty, established by the decrees of February 16, 1903, and June 4, 1912. A surtax of 1 per cent, based on the duty increased by the other surtaxes, imposed by the decree of December 29, 1910.

PEACE PROBLEMS AND PROGRESS.

PRICE STABILIZATION APPROACHING.

Due to the continued operation of the factors which resulted in the present high prices, stabilization of prices at new levels is approaching, in the opinion of "Commerce Monthly" the magazine of the National Bank of Commerce in New York City.

It is the conviction of the business world that high, or at least rising prices, are evidences of a satisfactory situation, in that they stimulate increased productive and commercial activity. Although the physical adjustment of American production to post-war demands has been more rapid than the most optimistic could have hoped, production has not yet expanded to what must be its normal post-war level.

There is now no fundamental reason to deter production, and not until it has increased to its new peace-time proportions can we rest in the assurance that as far as its effects on our economic life are concerned, the war has passed into history. Not only is production essential, but capital must be accumulated at a rate rapid enough to offset the destruction which took place during five years. The consuming public must recognize that it cannot continue indefinitely the scale of expenditure which followed as a reaction from the self-denial of war, but thrift for personal benefit is as essential as thrift for one's country. When every individual capable of gainful employment is producing to capacity and spending conservatively, our economic adjustment will be complete.

UNDER-PRODUCTION THE FIRST CAUSE OF HIGH PRICES.

In the report on the causes of the high cost of living published by the Council of National Defense, curtailment in the production of nearly all commodities except raw food products heads the list, and stimulation of production is the first remedy suggested to improve the situation. That this is assuredly putting matters in their right order is indicated by the facts presented regarding the condition of most industries, and notably with respect to the cotton and footwear situation, both closely identified with the manufacture of rubber goods.

When the war ended the world's cotton supply was below normal and supplies of cotton goods were also low. This year's cotton acreage, however, was about 9 per cent less than for 1918; present prospects indicate a small crop, and producers are expressing gratification because of the high prices they can command in consequence. Meanwhile more spindles have been idle during the first five months of 1919 than during the corresponding period of 1918, despite adequate supplies of raw cotton for this season's requirements and the release of labor by demobilization.

Turning to footwear, it is found that the production of boots and shoes for the first quarter of 1919 was about 60 per cent below that for the last quarter of 1918, the actual difference amounting to some 75,000,000 less pairs.

Such underproduction, due to various causes, notably labor's demand for less work and more pay, has been largely responsible for the rising scale of prices. Prosperity has but one possible basis, however, and that is adequate production of necessities of life, a condition invariably assuring prices fair to all.

PAMPHLETS ON AMERICANISM.

On "Constitution Day," September 17, many large corporations distributed to their employes hundreds of thousands of copies of a leaflet entitled "The Birthday of Our Constitution," which had been prepared by the National Industrial Conference Board, of which Frederic C. Hood, of the Hood Rubber Co., is treasurer. Like the leaflet "Our Country," which proved so successful on July 4, it was issued as a lesson in practical patriotism in the belief that if our Constitution and system of government were understood and the benefits derived under them by every citizen were known, there would be a better appreciation of individual rights and duties and many radical and even revolutionary ideas would be rejected. It is likely that similar leaflets will be published for distribution on future appropriate occasions.

MISUSE OF F. O. B. QUOTATION.

The National Foreign Trade Council is calling attention to the abuse of the term "F. O. B. Port," its detrimental effect on American foreign trade, and urging that the correct interpretation of the term at home and abroad be observed by all exporters. Free on board ship was the original meaning of the term and that is the general interpretation among foreigners. It is essential to the best practice for American exporters in making an "F. O. B. Port" quotation to have it mean "F. O. B. Overseas Vessel," but if they mean anything else they should make it clear what services, such as cartage or storage, will be charged to the buyer's account.

HOMES FOR WESTINGHOUSE EMPLOYES ON EASY TERMS.

The Westinghouse Electric & Manufacturing Co., East Pittsburg, Pennsylvania, has resumed its home-building program which was postponed during the war, and forty-eight houses are now under construction on a plot of 109 acres in Wilkins township along Ardmore Boulevard. It is estimated this tract will furnish homes for six hundred families. Sidewalks and paving will be laid, and gas, water and electricity installed. The houses will be of brick and hollow tile construction with concrete cellars and cement porches. They will be mostly of five, six and seven-room houses designed to meet the needs and the pocketbook of the man in moderate circumstances and will be sold at cost on easy terms to the employes of the company. A number of the dwellings also will be for rent.

COTTON IN SOUTH AMERICA.

As Brazilian and Peruvian cotton helped to make up the deficiency during the war, it is worth while to examine the possibilities of South American cotton. In the first place cotton is indigenous to the soil of what is called Latin-America, and was not introduced by the Spaniards. It is the home of the group of fine cottons which are the best in the world. All cotton roughly comes under three heads: Indian, Upland or American, and Peruvian, which last includes Sea Island, Egyptian, Peruvian, Caravonica and others. The production of Sea Island and Egyptian is now almost wholly outside of South America, but a number of fine cottons are still raised there, mainly in Brazil and Peru

COTTON GROWING IN BRAZIL.

In Brazil the possibilities of cotton growing are very great; already in every State along the coast from Pará to São Paulo large areas are devoted to cotton and in some cases the cultivation extends far inland. In Pará, where rubber was the main crop, cotton advanced greatly during the war, and there seems to be no limit to its possibilities. In 1910 the prophecy was made that Brazil might grow 20,000,000 bales; in 1918 she got as far as half a million, apparently. Until the 19th century England drew her supply mainly from the West Indies and South America.

Baines, in his "History of Cotton Manufacture," states that "Brazilian cotton was first imported from Maranham in the year 1781, but was very dirty. Pernambuco cotton exceeded even that of Demarara in fineness and goodness of staple; it was much sought after, its cultivation was extended, and it brought the highest price of all cotton except Sea Island." In 1820 29,000,000 lbs. out of 151,500,000 imported into England came from Brazil. American cotton checked the expansion, but in the cotton famine of the '60s there was another spurt, and in 1871 Brazil imported 80,000 tons. Just before the war the crop was about 400,000 bales of 250 lbs. The quality of Brazilian cotton is very good, so that it is hard to understand why the cotton growing industry has not developed.

BRAZILIAN VARIETIES.

Two main varieties are grown: the perennial tree cotton known as Creoulo or Maranhão, which yields well from the second year and lives 10 or 12 years. It bears open bolls all the year round. The cotton is of very fine quality, long and silky, and may be the parent of all long staple cottons, including Sea Island. It has been free from the insect pests that have made cotton trees unpopular in other parts of the world. The other kind of cotton is the "herbaceo," the annual growth, with short white lint. The chief trouble with Brazilian cotton is that long and short staple are mixed together, and the handling of the gathered crop is very careless. Yet 1,200 lbs. of lint have been raised on one acre; while in Egypt the average is 500 lbs.

It is tantalizing to know that Brazil could produce a crop of cotton as large as the whole world turns out, or that Peru could equal the amount of the Egyptian crop, but possibilities do not mean that anyone will try to turn them into realities. The present price of cotton may act as a stimulus.

PERUVIAN COTTON.

In Peru the climatic conditions are different and resemble those of Arizona and California, where cotton is grown. There are two varieties: Smooth Peruvian, which is about 65 per cent. of the crop, has a staple not over an inch in length, but strong and of good color. Rough Peruvian, which makes up the other third of the crop, is a perennial or tree cotton, and lives as long as 20 years. The staple is from 1¼ to 1½ inches long, and can hardly be distinguished from wool. The price seems to be fixed independently of all other cottons. Besides these some Sea Island and some Egyptian cotton is grown; the latter often commands a higher price in Liverpool than real Egyptian. So far Peruvian cotton has been immune from pests. All that was raised, however, just before the war was 130,000 bales of 500 pounds. The development of the crop would call for capital to build irrigation works; but there seems to be no reason why the expenditure should not be very profitable.

COTTON IN OTHER COUNTRIES.

In Argentina the cotton possibilities are also very good; the conditions are as favorable as in Brazil, and the experiments with Egyptian cotton were successful. The chief difficulty is in obtaining sufficient labor. Little seems to have been done in Venevuela, Colombia or the Guianas, where the possibilities are also good.

THE FRENCH COTTON TEXTILE INDUSTRY.

In 1913 France imported 1,453,256 bales of raw cotton, of 500 pounds each, 1,101,953 of which came from the United States, 130,073 from Egypt and 111,780 from British India. In 1917 the imports were 1,203,930 bales. The annexation of Alsace should increase the normal imports of raw cotton by at least 300,000 bales a year.

French imports and exports of cotton yarn for four years, up to and including 1916, the last year for which official figures can be obtained, were, in metric tons, as follows: 1913, imports 4,251, exports 9,063; 1914, imports 2,499, exports 3,802; 1915, imports 37,252, exports 1,980; 1916, imports, 81,954, exports 3,457.

Before the war France produced 6 per cent. of the world's output of cotton fabrics. The production of cotton fabrics increased remarkably between 1910 and 1912—from 120,000 to 225,000 metric tons. In 1913 France manufactured 220,000 metric tons, imported 4,392 metric tons (mostly from England and Germany), and exported 50,613 metric tons, of which more than one-half went to the French colonies. The following table shows the French production, imports, exports and consumption of cotton fabrics for the four years up to and including 1916, the latest year for which accurate figures are available:

	Production.	Imports.	Exports.	Consumption.
1913 ....*Metric tons*	220,000	4,392	50,613	173,780
1914	133,000	4,679	26,368	111,311
1915	218,000	35,669	21,391	232,368
1916	214,000	37,366	24,180	227,186

Owing to the abnormal conditions which are likely to prevail for the next few years at least, it is difficult to estimate the future of the French cotton-weaving industry. However, the number of French looms has been increased by 46,000 by the return of Alsace, making a total of 186,000 looms, if we figure the previous French total at 140,000, or an increase over 1913 of 33 per cent. The production of cotton fabrics, if it should increase in the same proportion, would amount to 292,600 metric tons, which, allowing for Alsatian consumption, would mean an exportable surplus of over 92,000 metric tons per year. ("Commerce Reports," July 30, 1919.)

A SEA ISLAND COTTON PROJECT.

The Mermentau Mineral Land Co., Inc., whose headquarters are at New Orleans, Louisiana, is making good progress in cultivating Sea Island cotton on its 14,000-acre tract of reclaimed land opposite Grand Cheniére on the Mermentau River in that state.

The first acre was planted three years ago and nearly a thousand pounds of seed cotton were gathered. This was such a good yield that the plot was extended to ten acres, with a result as satisfactory. Last year five small farmers in the vicinity were induced to plant from this seed, with the result that they raised 28,000 pounds of excellent cotton with exceptionally long staple. This spring 250 acres were planted and a gin erected, and if the season's results warrant, the entire tract will be devoted to cotton and cattle raising.

American Chemical Society.

RUBBER DIVISION MEETING.

The first meeting of American rubber chemists, organized as the Rubber Division of the American Chemical Society, took place at the fifty-eighth meeting of the Society at Philadelphia, September 2-6, 1919. A large and representative delegation of works chemists and others was in attendance and much interest manifested in the papers presented.

Charles L. Parsons, secretary of the American Chemical Society, in a few well-chosen remarks, congratulated the American rubber chemists on their organization as a distinct division of the Society and predicted great benefit to the cause of science and the welfare of the rubber industry when the realization becomes general that the manufacturer who secludes his processes as secrets is certain some day to awaken to the fact that he is failing to support his own interest by holding back in the interchange of ideas.

The Committee on Physical Testing, H. E. Simmons chairman, reported recommendations on tentative methods for the physical testing of vulcanized rubber goods. These included sampling, test pieces, physical tests, testing machine and computations. The tests described are for tensile strength and friction, and hydraulic and steam endurance tests on various types of hose and for belting, packing, gaskets, etc.

The report was accepted and referred to the Rubber Division for criticism and future adoption.

"A New Method for the Determination of Sulphur in Rubber Mixtures," by G. D. Kratz, A. H. Flower, and Cole Coolidge, was read by Mr. Kratz, who reviewed the methods of Esch, Spence and Young, and of Tuttle and Waters, and gave in detail the procedure of the new method, by which it is possible for one person to make 50 determinations of sulphur per week of 44 hours, together with other work. A single determination requires four hours' work.

"The Extraction of Rubber Goods" was presented by S. W. Epstein and B. L. Gonyo, of the Bureau of Standards. The solvents considered were (1) chloroform, (2) acetone (45) and carbon disulphide (55); and acetone (40) and chloroform (60), and a tabulation of results was shown indicating the relative efficiencies of the solvents following initial extraction of the vulcanized rubber sample for eight hours with acetone. The advantage of the mixed solvents was marked and somewhat in favor of the acetone-carbon disulphide mixture.

"The Theory of Balloon Fabric Protection" was briefly treated by the division chairman, Dr. John B. Tuttle. Balloons are classified in Army service as:

(1) Nurse balloons, capacity 5,000 cubic feet. These are used for transporting supplies of gas only.

(2) Kite balloons, capacity 160,000 cubic feet. They are used as captive observation balloons, requiring low visibility as targets and weather-proofing to withstand at least sixty days' exposure.

(3) Dirigible balloons, capacity 165,000 cubic feet, requiring practically the same protection as kite balloons.

Specifications of weights and constructions were given for fabrics for each sort of balloon named, including dyed plies and outside aluminum coating for protection against the heat and actinic rays of the sun.

A paper by Mr. W. W. Evans on "Balloon Seam Construction and Cements" embodied the results of experimental studies at the B. F. Goodrich plant. The temperature of the inside of a balloon is from 20 to 25 degrees F. higher than that of the outside air. This temperature can be lowered about five degrees by an outside coating of aluminum. A stock cement was used, consisting of specially washed Pará dissolved in 50 per cent by weight of benzol. A series of working cements prepared from this, using various rubber and resin ingredients, was investigated. A certain proportion of resin was proved advantageous, also cold vulcanization at the time of making the seam. Seams are cemented and lapped three-quarters of an inch, wiped with a solution of one-half per cent solution in a mixture of equal parts of carbon tetrachloride and benzol, and rolled in contact. The seams are reinforced by the application of cemented strips 1-½ inches wide on the outer balloon surface and two inches wide on the inside.

Discussion of Dr. Tuttle's and Mr. Evans' papers developed that on account of the shortage of rubber during the war the Germans were compelled to use cellulose acetate and dyed fabrics in balloon construction. In point of efficiency American practice in the balloon fabrics and rubber construction was equal to that of any other nation.

The expansion of rubber compounds during vulcanization has been studied experimentally by C. W. Sanderson. A volume of one cubic inch was placed in a cylindrical cavity. Temperature increase of five degrees F. per 20 minutes was applied by means of a surrounding steam atmosphere. The rubber was free to expand upward only against the force of a graduated spring and this motion communicated to a recording device modified from a steam engine indicator. Springs of 10, 50, and 100 pounds strength were used. The ten-pound spring was not sufficiently strong to prevent porosity in the sample. The results showed that the higher the quality of the rubber compound the higher was the coefficient of expansion. After the first 15 minutes of heating, the recorded curve of expansion became a straight horizontal line. Fine Pará shows a slower expansion than brown crêpe. Milling increases the rate of expansion and over-milling will deteriorate fine Pará in this respect to the expansion rate of brown crêpe. The increase of specific gravity in cured over uncured rubber compositions is due to elimination of contained air. The contraction of a rubber compound after cure is greater than its expansion during cure.

A paper on "The Volume Increase of Compounded Rubber Under Strain," by H. F. Schippel, was particularly interesting and illustrated by a simple and striking experiment. The theory was advanced that under strain the rubber in a cured rubber mixing is drawn away from each particle of mineral matter, forming vacua on opposite sides of the particle. This condition results in a distinct increase in volume varying with the elongation and is made evident experimentally by an apparent decrease of specific gravity.

The experiment used in illustration was as follows: a cured high-grade compounded ring, suitably proportioned as to diameter and weight was stretched over a short cylinder of paraffine and a light elastic band snapped over both. This combination was seen to float in a tall glass vessel of water. That the floating effect was due entirely to the presence of vacua formed by stretching the ring over the paraffine plug was demonstrated by removing the ring from its strained position and holding it in place on top of the paraffin, retaining it there by means of the same elastic band. When placed in water the combination slowly sank to the bottom of the vessel, due to the lessened volume of the unstrained ring by the elimination of the vacua.

J. H. Scott led a symposium on "The Action of Accelerators During Vulcanization." His paper was a comprehensive review of the work of Dr. Spence and himself on the effect of sodium hydroxide, soda-lime and piperidine. The ideal catalyst is one the minimum quantity of which will give the maximum stimula-

tion to the reaction combining sulphur with rubber. Nitrogenous compounds are the most active catalysts.

The paper of G. D. Kratz, A. H. Flower and Cole Coolidge on "The Action of Certain Organic Accelerators in the Vulcanization of Rubber" treated on substances all of which have been discarded in their practice for various reasons. The accelerating effect was determined in percentage proportion for each catalyst treated referred to that of aniline as standard. Anhydrous formaniline was rated at 75 and of para-phenyline-diamine at 17. Accelerators should be used in proportions based on their molecular weights.

C. W. Bedford and Winfield Scott on "Reactions of Accelerators During Vulcanization" illustrated these reactions by graphical formulae. The opinion was expressed that thiocarbanilide is the most widely used accelerator in American practice today. The presence of zinc oxide has a very marked influence in aiding the action of thiocarbanilide. The effect of this accelerator is not due to its splitting off aniline.

D. F. Cranor spoke on "The Effect of Organic Accelerators on the Vulcanization Coefficient" with special reference to hexamethyl-tetramine and thiocarbanilide, using mixings of smoked sheets 100; sulphur 6; zinc oxide 1, and one-half of one per cent of hexamethyl-tetramine and thiocarbanilide. Brown crêpe will not cure satisfactorily without the use of accelerators. The presence of zinc oxide is found desirable to activate the accelerators.

The discussion on the above papers on accelerators was very brief. Dr. L. E. Weber asked if the action of the catalyzer on the vulcanization of rubber with sulphur is considered as apart from the polymerizing effect taking place in the rubber. To this, J. H. Scott replied that a catalyst may take part in both vulcanization and polymerization, but does not necessarily polymerize the rubber.

G. D. Kratz in answer to a question explained that his views were in substantial agreement with those of Ostromislensky on vulcanization.

The essentials of a procedure for the determination of cellulose in rubber goods was considered by S. W. Epstein and R. L. Moore and details of a proposed method given. This method is conducted in three stages: (1) digestion for four hours in cresol, (2) treatment with hot ten per cent solution of hydrochloride acid, (3) acetylation of the cellulose. The loss of weight due to acetylation represents cellulose.

Reviewing and summarizing the investigations of Eaton, Grantham and Day; H. P. Stevens; and Philip Schidrowitz, Dr. J. B. Tuttle in his paper on "The Variability of Crude Rubber," stated that this variability is measured by the differences in effect of the accelerating substances natural to the latex or formed in the crude rubber during preparation and the retarding agencies introduced, as for example by smoking. Such variations in curing quality are overcome in practice by the use of two to four per cent of litharge or one-half to one per cent of ordinary organic accelerators, such as aniline or hexamethyline-tetramine. The work of Eaton shows the variation the natural accelerators present and not the variation of the rubber itself.

Dr. Tuttle expressed the view that tensile strength compared to rate of cure determines the value of a rubber in practical use. For example, a slow-curing rubber with low tensile strength can be rendered satisfactory for use by the addition of an accelerator which will increase its speed of vulcanization and raise its tensile to that of a rubber naturally possessing these qualities.

D. C. Cranor advocated the use of the load required to pro duce a standard elongation as the determining factor in practical evaluation of crude rubber under manufacturing conditions. Mr. Postmontier suggested that the executive committee of the Rubber Division take under consideration and later report practical methods of testing the variability of crude rubber under conditions prevalent in the manufacture of rubber goods.

H. P. Gurney, in considering "Some Methods of Testing the Hardness of Vulcanized Rubber," compared the durometer of Shore; the plastometer of Pusey and Jones; the resiliometer of Widney, and the densimeter of the Boston Belting Co. Hardness of rubber was defined as the force required to displace a unit volume of rubber and may be expressed by the formula:

$$H = \frac{M}{L \cdot T^2}$$

H, indicates hardness; M, mass; L, the load applied, and T, duration of time of load application.

"The Manufacture and Use of Crimson Antimony" was briefly treated by J. M. Bierer, who reported that the most practical method found after extended study was by the formation of antimony chloride by direct action of chlorine on the metal and subsequent conversion of the product into antimony tri-sulphide.

"Carbon Black—Its Properties and Uses," by G. St. J. Perrott, read before the Division of Industrial Chemists and Chemical Engineers, was by request of Dr. Tuttle read again before the Rubber Division. General description of the manufacturing process and machinery employed was given and illustrated by lantern slides. Carbon black has many industrial uses, the chief of which is the manufacture of printing inks and rubber goods, 10,000,000 pounds annually being used in printing ink and 20,000,000 pounds annually in rubber goods, chiefly in tires. The form of apparatus used in the condensation of the black from the burning gas produces either "short" or "long" black, so called because of the short buttery consistency of the preparation of oil and black in printer's ink or the opposite tendency of the mixture to draw out when separated between the thumb and finger. By microscopic examination the difference is seen to be due to a tendency in the case of "long" black for the particles of the pigment to agglomerate. The diameter of carbon black particles varies from 75 to 100 millimicrons.

A short descriptive paper, "Research on Zinc Products for the Rubber Industry," was presented by P. R. Croll and I. R. Ruby.

Owing to the length of the program of papers and for other reasons the following were omitted or read by title: C. Olin North, "The Effect of Compounding Ingredients on the Physical Properties of Rubber." (Omitted.) "Symposium on the Testing of Pigments." (Omitted.) C. P. Fox, "Laboratory Aprons." (Omitted.) H. E. Simmons, "The Value of a Library to the Rubber Laboratory." (By title.)

All papers read at the meeting are subject to the rules of the American Chemical Society and will not be published until released by that body.

The report of the Fruit-Jar Committee was filed. The efforts of manufacturers and leading jobbers to educate jar-ring users was endorsed and dependence on their guaranties advised. The committee endorsed the recommendations of the United States Bureau of Agriculture, States Relation Section, on jar rings, with tests, adapted for use at the counter and in the kitchen for determining jar-ring quality. Another test was added, namely, pinching the flange of the ring folded each way. The rubber should not show cracking under this treatment.

The sessions of the Rubber Division closed with the election of the following officers for the ensuing year.

Chairman: Dr. W. K. Lewis, Massachusetts Institute of Technology.

Vice-Chairman: George D. Kratz, Falls Rubber Co.

Secretary: Arnold H. Smith, The Goodyear Tire & Rubber Co.

Executive Committee: J. M. Bierer, Boston Woven Hose & Rubber Co.; W. W. Evans, The B. F. Goodrich Co.; C. W. Sanderson, The Fisk Rubber Co.; J. W. Scott, Plexus Tire & Rubber Co.; George Oenslager, The B. F. Goodrich Co.

What the Rubber Chemists Are Doing.

THE NATURE OF VULCANIZATION.

By Dr. H. P. Stevens.[1]

Part I.

THE COMBINATION OF RUBBER WITH SULPHUR.

Two theories have been put forward to explain the change which takes place in the physical and chemical properties of rubber when vulcanized. According to one theory, vulcanization is primarily an adsorption process; according to the second, a chemical reaction is involved, the sulphur entering into a chemical combination with the rubber hydrocarbon. It would, however, appear that those who uphold the physical theory admit the possibility of a subsequent chemical combination of the rubber and sulphur taking place, while the supporters of the chemical theory admit that adsorption of the sulphur may precede chemical combination. It remains to be shown whether or no the technical effect of vulcanization can be produced without any chemical combination between sulphur and rubber hydrocarbon taking place.

The systematic researches of Spence and his collaborators (*"Kolloid Zeitschrift,"* 1911, 8, 304; 9, 300; 1912, 10, 300; 11, 28, 274; 1913, 265), which in the main have been corroborated by later work, clearly show that sulphur enters into chemical combination with rubber during the ordinary vulcanizing process as, for instance, when a mixture of rubber and sulphur is heated for an hour or two at temperatures such as 130 degrees—150 degrees C. The velocity of the reaction is proportional to the time of heating at a constant temperature; the temperature coefficient normally lies between 2 and 3 (*Ibid.*, 11, 32), but is considerably influenced by catalysts (the so-called accelerators).

More recently the subject has been studied by Harries and Fonrobert (Berlin, 1916, 49, 1196, 1390); these authors, without controverting the work of Spence, claim that vulcanization is essentially a physical process and that vulcanized rubber can be prepared which is free from combined sulphur. This conclusion is based on one vulcanizing experiment only, carried out on a rather large scale. The acetone-extracted vulcanizate was practically free from sulphur. In the course of my own work on vulcanization I have made numerous sulphur estimations in acetone-extracted vulcanizates but have never obtained a figure comparable to that of Harries. It was therefore thought advisable to carry out a control of Harries' vulcanization experiment before proceeding with further research.

There are several points in regard to Harries' experimental procedure which are open to criticism. The rubber was mixed with 10 per cent of sulphur and disks vulcanized for a short time (½-hour) at a fairly high temperature (145 degrees C.). The thickness of the disks is not given but, as these were used for tensile tests with a Schopper machine, they were probably 5—6 mm. thick so as to give a ring of standard size. It is doubtful whether sufficient time was given for the heat to penetrate evenly through so thick a layer of rubber, and it is probable that the outer layers were more fully vulcanized than the inner parts of the disks. It is stated that the conditions of vulcanization were similar to those technically used in the manufacture of inner tubes, but these latter usually contain an appreciable proportion of antimony sulphide in addition to the sulphur which facilitates the conduction of heat through the mass, also of "accelerators" which are capable of reducing the time required for vulcanization from one-half to one-third of that otherwise required. It is stated that the physical qualities of the vulcanized rubber were satisfactory, but the tensile figures are not given and the fact that the rubber became soft and sank together during extraction points to very incomplete vulcanization. This does not happen with moderately under-vulcanized rubber. Harries and Fonrobert extracted a large quantity (500 grms.) with acetone for a long period (60 days).[2] At the end, the rubber contained only 0.29 per cent of sulphur. It was assumed that, given sufficient time, this residue would eventually have been removed and therefore the sample may be said to contain no combined sulphur. Owing to the large amount of rubber taken for extraction and the defects of the extraction apparatus, it appeared probable that this result would be more quickly obtained by the extraction of small samples, rolled very thin, using a form of apparatus in which extraction takes place at the boiling point of acetone (Analyst, 1913, 38, 143).

I determined therefore to vulcanize a mixture of Para[3] rubber and 10 per cent of sulphur under the same conditions as employed by Harries, that is for 30 minutes at 145 degrees C., but in the form of a thin sheet ½—1 mm. thick so to obtain uniform vulcanization. At the same time a second experiment was made with the same mixture of rubber and sulphur, vulcanizing for 19 minutes only. It is well known that Pará rubber from different sources varies in rate of vulcanization. The experiments were therefore extended to include a sample of fast vulcanizing plantation Pará rubber. Approximately one-quarter of each sample was removed after 1, 2, 4, and 9 weeks, extraction (1 week= approximately 50 hours), and the sulphur estimated with the following results:

Para Rubber *A* Vulcanized in Steam at 145 Degrees C.

Period of extraction.	Combined sulphur per cent. (1) 30 min.	(2) 19 min.
1 week	1.54	0.94
2 weeks	1.54	0.96
4 weeks	1.47	0.95
9 weeks	1.55	0.96

Para Rubber *B*.

(3) and (4) were vulcanized to correspond with (1) and (2) above. They were extracted for periods of 2 weeks and 9 weeks.

Period of extraction.	Combined sulphur per cent. (3) 30 min.	(4) 19 min.
2 weeks	1.11	0.67
9 weeks	1.08	0.70

Fast Vulcanizing Para Rubber *C*.

This sample was treated similarly to B.

Analyses were made in duplicate.

Period of extraction.	Combined sulphur per cent. (5) 30 min.	(6) 19 min.
2 weeks	2.69	1.40
	2.33	1.53
9 weeks	2.39	1.47
	2.33	1.46

The vulcanized specimens were subjected to physical tests. Ring-shaped test pieces gave the following results—

Rubber sample.	Time of vulcanizing (minutes).	Breaking strain, grms. per sq. mm.	Final length (original length=1).
(1) *A*	30	830	10.7
(2)	19	490	11.2
(3) *B*	30	750	11.1
(4)	19	290	12.2
(5) *C*	30	1300	10.8
(6)	19	890	11.2

With regard to these figures, the breaking strain of (5) is only a little below that normally given for a fully vulcanized Pará rubber. This sample contains about 2.4 per cent of combined sulphur whereas a fully vulcanized rubber usually contains 2.8—3 per cent calculated on the rubber (coefficient of vulcanization). The breaking strains of (1) and (3) are not much over one-half of what would be obtained if fully vulcanized. The

[1] Dr. H. P. Stevens in "The Journal of the Society of Chemical Industry," July 15, 1919.

[2] Presumably the extraction was not carried on during the night as the apparatus was leaky. Sixty days may therefore be taken to represent about 500 hours.

[3] That is, derived from *Hevea brasiliensis*.

final length (length at the moment of rupture) corresponds throughout with the breaking strain and tends to give a lower figure, the higher the breaking strain. It may be said that (1) and (3) are quite typical of a moderately under-vulcanized rubber. All vulcanized specimens, even those vulcanized for 19 minutes only, swell but do not dissolve in cold benzene.

These analytical results show clearly that, within the limit of accuracy of the sulphur estimations (the rubber being in the form of thin sheet), the whole of the so-called free sulphur is extracted in two weeks. A further seven weeks' extraction did not reduce the amount of combined sulphur. To judge from the figures for the rubber A, the extraction of free sulphur is complete in one week (say 50 hours), and for technical work a 5—10 hours' extraction is usually regarded as sufficient.

These results are in total disagreement with those obtained by Harries and Fonrobert. All three specimens of raw rubber contained over 1 per cent of combined sulphur after 9 weeks' extraction when cured for 30 minutes at 145 degrees C. (45 pounds steam pressure), whereas Harries and Fonrobert obtained only 0.29 per cent under less favorable conditions for the extraction of the free sulphur. When vulcanized for only 19 minutes, the figures for combined sulphur are more than double those obtained by Harries and Fonrobert. One can only conclude that these investigators were working with an excessively slow vulcanizing and inferior quality of rubber or that, owing to the thickness of the disks used and the short time of vulcanization, or for some other reason, the rubber was only surface vulcanized. It appears therefore that the technical effect of vulcanization has not been obtained without an appreciable amount of sulphur becoming insoluble in acetone, that is presumably combined with the caoutchouc hydrocarbon.

Part II.

THE ACTION OF SOLVENTS ON VULCANIZED RUBBER.

Although the process of vulcanization is of enormous technical importance, it is not possible to formulate a definition of vulcanization which will enable a sharp distinction to be drawn between a vulcanized and an unvulcanized rubber. Technically, vulcanization produces a physically improved product, showing greater indifference to changes of temperature and greater tensile strength and elasticity. Of the ordinary soft vulcanized goods, 2—4 per cent of the sulphur cannot be extracted with acetone—the so-called combined sulphur. By "undervulcanizing," the amount is smaller and the product is softer and physically weaker, as already shown in Part I. If the vulcanization be carried to its limits, hard resilient solid (vulcanite or hard rubber) is produced, and up to 32 or 33 per cent of sulphur may remain undissolved after prolonged acetone extraction.

Solvents such as benzene and carbon bisulphide are frequently employed to differentiate between vulcanized and unvulcanized rubber (compare Harries, Berlin, 1916, 49, 1196), on the assumption that vulcanized rubber is insoluble and unvulcanized rubber soluble, but tests with different solvents under different conditions showed that the "solubility" of vulcanized rubber in organic solvents is dependent on (1) the nature of the solvent, (2) the time of immersion in the solvent, (3) the temperature, (4) the degree of vulcanization, and (5) the age of the vulcanized specimen. I have already remarked on the progressive solubility in benzene of rubber "vulcanized" with benzoyl peroxide ("Journal of the Society of Chemical Industry," 1917, 109), the rubber tending to insolubility in benzene with intensification of the vulcanizing conditions as, for instance, by increasing the proportion of benzoyl peroxide. Vulcanization with sulphur and with benzoyl peroxide is therefore analogous as regards the physical properties and solubility of the vulcanizate.

Raw Rubber. It is generally assumed that raw rubber is soluble in solvents such as benzene and carbon bisulphide, but in many cases the solubility is only partial after months of immersion in the solvent. It is necessary to distinguish between:

(a) Rubber obtained by evaporation or coagulation without mechanical working—at the most, a pressing of the clot to expel part of the mother liquor and facilitate drying. To this class belong the so-called plantation sheet rubber, "fine Pará," and most wild sorts.

(b) Rubber which has been worked (crêped) after coagulation in the moist state or by subsequent working (mastication) of the dry rubber of the type described under (a). The working, whether crêping or mastication, is accomplished by passing the rubber through differentially geared rollers.

Rubber in category (a), when immersed in a solvent, swells considerably unless of low quality, i.e. degraded[4] rubber which is soft, adhesive, or even semi-fluid, owing to unsatisfactory treatment in preparation or preservation. Taking the case of plantation sheet or dry Pará rubber, the rubber swells enormously and gradually passes into solution, the mass of rubber retaining its swollen skeleton form. After a long period and treatment with fresh solvent, the skeleton may collapse, leaving a slimy deposit rich in nitrogen. It is probable that the retention in shape and only gradual dissolution is caused by a network of protein films formed when the rubber is coagulated. This is particularly the case with rubber coagulated with tannin or products containing tannin which act on and toughen the protein films. The reticulated structure of these films is microscopically visible if thin pieces of the rubber are swollen in benzene with due care.

Rubber in category (b) readily dissolves in benzene; the amount of swelling depends on a variety of circumstances, including the degree of working to which it has been subjected.

Caspari ("Journal of the Society of Chemical Industry," 1913, 1041), separated samples of rubber into a soluble and a "pectous" variety by prolonged extraction with petrol ether in the cold. I have repeated Caspari's experiments but was unable to obtain concordant results in repeat extractions. The proportion of soluble to "pectous" appeared to depend on the period of extraction. Moreover, I found that the "pectous fraction," if allowed to stand sufficiently long in cold petroleum spirit, dissolved wholly with the exception of a small quantity of slimy nitrogenous matter which settled to the bottom of the containing vessel, so that the behavior of petroleum spirit as a solvent differed from that of benzene in degree and not in kind. Petroleum spirit is merely a less effective solvent than benzene.

Raw and vulcanized rubber exhibit varying behavior when immersed in a solvent. This should be noted as indicating the degree of "solubility." The most readily soluble rubber dissolves with little or no swelling, almost like a crystalloid. A less easily soluble rubber swells before dissolving. As the volume of the gel increases, more difficulty is experienced in producing a permanent emulsion with excess of solvent. Vigorous shaking is necessary and eventually one arrives at a stage when gelatinous flakes remain "undissolved." This marks the limit of "solubility." Beyond this stage, the more fully the rubber is vulcanized (i.e., the higher the percentage of combined sulphur), the less the rubber swells in the solvent.

Vulcanized Rubber. No investigations have been published dealing with the solubility of vulcanized rubber in solvents such as benzene and carbon bisulphide. The general impression is that vulcanized rubber is insoluble in contrast to the solubility of raw rubber. In connection with the previous paper it was important to ascertain the lower limit of combined sulphur which would confer the property of insolubility in organic solvents. Preliminary experiments showed that the quantity of combined sulphur required to confer insolubility as above defined was very small, and it was therefore found impracticable to vulcanize at the previous temperature of 145 degrees C. as the

[4] The term "depolymerized" is usually employed but this presupposes a molecular change for which proof is wanting. I therefore prefer the term "degraded."

time of heating was too short and the temperature of the steam digester could not be raised sufficiently rapidly to enable accurate measurements to be made of the time of heating. Therefore a lower temperature was chosen. Specimens consisting of 90 parts of raw rubber and 10 parts of sulphur were vulcanized for 30, 40, 50, and 60 minutes at 125 degrees C., at which temperature the rate of vulcanization was reduced to about one-seventh of that at 145 degrees C.

The following figures were obtained after exhaustive extraction of the vulcanized specimens with acetone at the boling point:—

Minutes Vulcanized at 125 Degrees C.	Sulphur Per Cent.
(1) 30	0.27
(2) 40	0.39
(3) 50	0.45
(4) 60	0.54

These figures show that the percentage of combined sulphur is approximately proportional to the time of heating, as in the case of more fully vulcanized rubber.

After standing 24 hours, small pieces of the vulcanizates were allowed to swell in benzene overnight. On shaking, (1) dissolved readily, giving an apparently homogeneous solution; (2) appeared to be only partly dissolved and the solution was ropy; (3) gave a swollen mass which was broken up on shaking, gelatinous lumps remaining visible; (4) was unaffected by shaking, the swollen mass remaining unbroken. We have therefore the transition states between solubility and insolubility of the vulcanizate in benzene, and according to Harries, (1) might be taken as the unvulcanized or metastable form, while (4) certainly represents the stable or vulcanized form. On this basis about ½ per cent. of combined sulphur is sufficient to confer the property of insolubility in benzene.

(To Be Continued)

SWELLING OF RUBBER IN SOLVENTS.[1]

For rubber, the rate of swelling in a solvent depends on the nature of the liquid used; the origin and purity of the rubber; the coefficient of vulcanization, and the temperature. The rate and extent of swelling are believed to provide a more rapid and reliable indication of the "nerve" of rubber that is given by viscosity measurements. Most of the materials present in technical raw rubbers, such as resins, do not interfere with the "turgescence" curve, but the natural proteins retard arrival at the critical point at which the rubber loses its tenacity and resistance to stretching, and it is claimed that their quantity can be estimated from this effect.

With vulcanized rubber, the greater the proportion of mineral fillers and of factice the more rapidly this "critical point of turgescence" is attained. Decrease in the proportion of rubber and increase in that of sulphur diminishes the rate of swelling. The rate of swelling may be measured gravimetrically or volumetrically. The latter being more convenient. A modification of Justin-Mueller's apparatus for the examination of cotton during mercerization "Journal of the Society of Chemical Industry," 1914, page 1201) is recommended for this purpose.

The order of various solvents in their effect on vulcanized rubber has been found experimentally to be tetrachloroethane, carbon disulphide, carbon tetrachloride, petroleum spirit (boiling at 158-212 degrees F.), and benzene. The rate of swelling in the boiling solvents or their vapors is much greater, but the results for the various solvents are less comparable, due to the differences in temperature. The advantage of tetrachloroethane over carbon disulphide at the same temperature is only slight by volume, but much greater by weight. The relative positions of petroleum spirits and benzene are reversed if the swelling is measured by increase in weight.

The values of the swelling constant, x, calculated by Kirchoff's formula $Q = KSx$, where S is one hundred times the specific gravity of the solvent, K the volume before swelling, and Q the maximum volume, were found to be as follows:

Solvent.	Swelling Constant.
Tetrachloroethane	2.107
Carbon tetrachloride	1.872
Carbon disulphide	1.747
Benzene	1.672
Petroleum spirit	1.245
Heptane	1.727
Tetrachloroethylene	2.072
Pentachloroethane	1.987

[1] A. Dubosc. "Le Caoutchouc et la Gutta-Percha," 1919, pages 9781-9783; 9813-9819.

PREPARATION OF RAW RUBBER.

In reviewing recent investigations on the production of raw rubber, E. de Wildeman finds that fine hard Para is generally not superior to plantation rubber. In the preparation of plantation rubber it is advisable to avoid excessive dilution of the latex; use the least quantity of coagulant; use bisulphite, and smoke the rubber at not exceeding 55 degrees C. (133 degrees F.). Smoking should begin one day after milling the rubber and continue for two weeks after the rubber is dry. Sheet rubber is superior to crêpe, and the latter is better thick than thin. It is recommended that as few forms of rubber as possible be made and preference is given to smoked sheet. (*"Le Caoutchouc et la Gutta-Percha,"* volume 16, 1919, pages 9826-29.)

COAGULATION OF HEVEA LATEX.[2]

Reviewing the researches on latex coagulation, G. Vernet shows that the results obtained with latex preserved by the addition of ammonia may be very misleading, and that it is necessary to use fresh latex. This may account for some of the results by the advocates of the enzyme theory of coagulation.

Regarding the various theories advanced by others, the author concludes that the function of the protein constituents of the latex is of first importance in coagulation. All the experiments made in this connection can be explained by the reactions of these proteins. Coagulation results from an insoluble condition of the proteins. Drying and centrifugal separation are not alone able to produce coagulation, but may assist separation in presence of ordinary coagulants. Without the use of coagulants these processes simply increase concentration of the latex and gradual coalescence of the rubber globules, leaving the proteins entirely removable by washing. While the possible activity of enzymes during spontaneous coagulation of latex cannot be denied, it is significant that their presence has not been directly demonstrated and that coagulation can be explained satisfactorily without assuming their existence.

Latex below 39.2 degrees F. can be preserved perfectly for more than a month, and by tapping with careful exclusion of micro-organisms and collecting in sterilized glass tubes it is possible to obtain samples which remain liquid a month or more.

Spontaneous coagulation can be satisfactorily obtained with ordinary latex by adding one to ten grams of sugar per liter, excluding air during coagulation and maintaining the temperature at 86 to 113 degrees F. Serum from a previous coagulation or a selected growth of micro-organisms may be employed as a further aid. Latex so treated will coagulate with perfect evenness if diluted with several times its bulk of water.

CHEMICAL PATENTS.

THE UNITED STATES.

Preservative Composition for treating rubber fabric, comprising a mixture of tar, pitch, resin, rubber cement, fish glue, glycerine, and turpentine. (Richard E. Thierfelder and John Schmælzle, Jr., Milwaukee, Wisconsin. United States patent No. 1,312,007.)

Process for Vulcanizing Rubber, which comprises mixing an organic vulcanizing agent and red lead with rubber and vulcan-

[2] *"Le Caoutchouc et la Gutta-Percha,"* 1919, pages 9835-9844.

izing the mixture. (Sheldon P. Thacher, Weehawken, New Jersey, assignor to Revere Rubber Co., Providence, R. I., United States patent No. 1,312,144.)

METHOD OF RECOVERING RUBBER SOLVENT in the manufacture of articles by the dipping method. The dipping form, coated with the rubber solution, is passed though a bath which is mutually soluble with the rubber solvent but not with the rubber. The Solvent is recovered from the bath by agitating the latter with oil, permitting the mixture to settle and separate, the solvent being taken up by the oil. (John D. Morron, Lakewood, Ohio, assignor to The Mechanical Rubber Co., New York City. United States patent No. 1,312,452.)

THE DOMINION OF CANADA.

PROCESS FOR REGENERATING VULCANIZED RUBBER by which finely divided rubber is heated in an oil-jacketed vessel, after removal of its contained air by vacuum, to a uniform high temperature. (The Dunlop Co., Limited, assignee of Douglas F. Twiss, both of Birmingham, Warwick, England. Canadian patent No. 192,356.)

VULCANIZING PROCESS. An accelerator for the vulcanization of rubber consisting of an alkali metal dissolved in a fluid or readily fusible organic hydroxy-compound other than glycerol or glycol and of predominant hydroxylic character, such as butyl or amyl alcohol or an aromatic hydroxy-compound such as phenol. (The Dunlop Rubber Co., Limited, Westminster, London, assignee of D. F. Twiss, Sutton Coldfield, Warwick, both in England. Canadian patent No. 192,470.)

THE UNITED KINGDOM.

LAMP BLACK is rendered dustless by mixing with water to form a paste, adding 2/5 per cent of resin oil, and then heating to drive off the water. (E. L. Curbishley, Wood Lea, Albert Road, Cheadle Hulme, Cheshire. British patent No. 127,770.)

VULCANIZABLE PLASTIC COMPOSITION. Example of proportions is: 60 parts of reclaimed rubber, 30 parts of leather waste, and 10 parts of ground tire cover. The product may be used as a substitute for leather or for solid tires, floor coverings, engine packing, pump valves, etc. (W. S. Smith, The Drive, Fulham Road, London. British patent No. 127,932.)

CEMENT for the repair of apertures in submerged ships consists of five parts by weight of crude rubber dissolved in naphtha; three parts of rosin; two parts of white lead; nine parts of coal pitch; and one-quarter part of shellac. The mixture is used hot to cement metal surfaces and may be applied to cloth to form an adhesive patch. It may be thinned with naphtha and used as a paint. (V. Revello, 28 George street, Cardiff, Glamorganshire. British patent No. 128,755.)

GERMANY.

REGENERATION OF VULCANIZED RUBBER is effected by heating the material to a high temperature without melting, in a vacuum or in an inert gas. The harmful effect of the air on heated rubber is avoided by rapid cooling by treatment with cold water or solutions of sodium carbonate or alkali. (B. J. F. Varinhorst, The Hague, and J. G. Fol, Delft, Netherlands. German patent No. 302,995. March 19, 1914.)

PROCESS OF SEPARATING FIBROUS MATERIALS FROM VULCANIZED RUBBER GOODS. The material is finely divided and stirred for a short time with slightly warm water. The fibers become wet more easily than the rubber and sink, while the rubber particles float and are skimmed off the surface. (W. Golombek, Spandau, German patent No. 303,171, June 24, 1916.

OTHER CHEMICAL PATENTS.

THE FRENCH REPUBLIC.

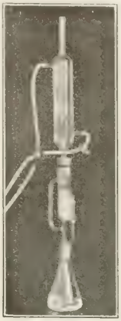
NO. 490,730. Process of making a product to replace ebonite, bakelite, and other similar substances. Naamlooze Vennootschap Nederlandsche Maatschappij tot Exploitatie van Optimiekfabrieken.

492,140. Process of manufacturing a substance having caoutchouc as a base. The Goodyear Tire & Rubber Co., Akron, Ohio.

LABORATORY APPARATUS.

ALUNDUM CRUCIBLES AND THIMBLES.

ALUNDUM is an electric furnace product of exceptionally high melting point. It is made of fusing the extremely refractory mineral, bauxite, a natural hydrate of alumina, or a pure aluminum oxide in an electric furnace of the arc type. The refractory material thus produced contains from 92 per cent to practically pure aluminum oxide, depending upon the material fused. Alundum not only has a high melting point, but it is not easily affected by chemicals and has a high heat conductivity.



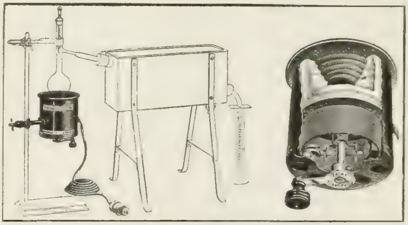
ALUNDUM EXTRACTION APPARATUS.

Alundum is also prepared in various porous forms for laboratory use in filtration and for extracting soaps, fats, food, rubber, etc., by both organic and inorganic solvents, after the arrangement shown in the illustration. (Norton Co., Worcester, Massachusetts.)

ELECTRIC HEATER FOR THE DISTILLATION OF GASOLINE.

The instrument shown in the illustration is constructed according to a new idea in electric heaters designed in accordance with suggestion of Dr. E. W. Dean, of the United States Bureau of Mines.

The spiral heating coil of nichrome wire is inserted in a conical spiral groove, turned in a solid block of insulating material. The separate turns of wire are in contact with the insulating block for only a small part of their circumference and, as a result, practically no heat is wasted by absorption in the block. The conical shape of the depression in the block, combined with the high heat-radiating qualities of the material used, causes practically all of the heat to be focused upon the 1¼-inch



ELECTRICAL GASOLINE DISTILLATION HEATER

opening in the transite top of the heater. As a result the flask containing the gasoline is subjected to an intense heat (sufficient to ignite paper immediately) without the danger of breakage due to contact with a bare flame or a red hot coil. A variable rheostat is mounted in the same case with the heating coil, permitteing the temperature to be raised or lowered at will. An enlarged view, and partly in section, is shown in the illustration.

Many additional uses will be found for this device in the laboratory, as it furnishes a rapid and efficient source of concentrated heat which will be found preferable to a gas flame for many operations. (Central Scientific Co., 460 East Ohio street, Chicago, Illinois.)

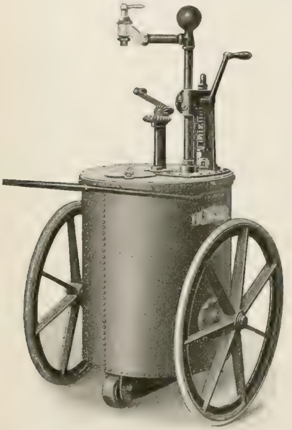
DR. A. VAN ROSSEM will teach the chemistry and technology of rubber in the department of chemical technology in the Technical High School, at Delft, Holland.

New Machines and Appliances.

PORTABLE TANK FOR RUBBER CEMENT.

The economical distribution of rubber cement to the various departments is a question of interest to all manufacturers that use this material.

The cement tank shown in the accompanying illustration is mounted on rubber-tired wheels and may be easily moved by one man who keeps the individual containers filled throughout the entire factory.



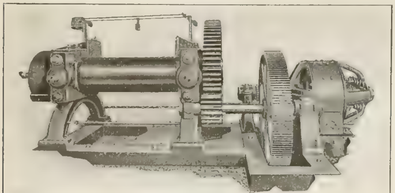
Bowser Rubber Cement Tank.

The pump measures one quart with a full stroke of the plunger, or any intermediate quantities may be drawn by adjusting the quantity stops, and a discharge register tells the quantity of cement discharged from the pump. A hollow-ball expansion chamber, permits expansion of the liquid in the pump cylinder due to changes in temperature.

The galvanized steel tank is heavily reinforced, all seams being riveted and soldered from the inside and outside to insure against leaking, and all openings are practically air-tight. The top is flanged and bolted to the shell and may easily be removed for cleaning and a hand-operated agitator insures uniform consistency of the rubber solution. (S. F. Bowser Co., Inc., Fort Wayne, Indiana.)

RUBBER MILL EQUIPPED WITH INDIVIDUAL MOTOR.

Electric drives for mill lines are common in large rubber plants, but this method of drive is not always possible or practical in the smaller rubber mills. Even in the large plants individual mills are required for special work far from the mill-line, for instance, the warming mills in the calender room.



Individual Motor-Driven Mill.

For such installations and the small rubber manufacturer, the individual motor driven mill shown in the accompanying illustration has been designed.

It is substantially constructed with a rigid one-piece bed-plate that supports the mill, drive and motor. The jack-shaft bearing is contained in the housing frame and is of the ring-oiling type. The outboard bearing is also ring-oiled and the reducing gears are machine cut. This type of mill is built with two sizes of rolls; 16 by 42 inches and 18 by 50 inches. (Wm. R. Thropp & Sons Co., Trenton, New Jersey.)

STACKING TOTE BOXES.

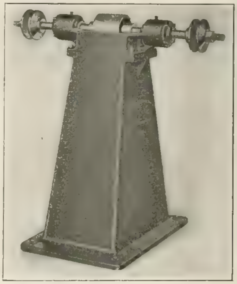
A new form of stacking steel boxes adapted for use with rubber compounding ingredients is here illustrated. It is stiff in construction, has spot-welded embossed runners which present the only line of friction and remove wear from the bottom in dragging over the floor. Spot-welded guides on the ends guide the boxes into stacking position when they are allowed to drop one into another. These guides in conjunction with the runners also serve to prevent any sidewise shifting of boxes while being trucked.

Compound Boxes.

Box weights do not vary more than two per cent and are furnished liquid tight if desired. It is claimed for this box that it combines maximum strength with minimum weight. (The New Britain Machine Co., New Britain, Connecticut.)

BALL-BEARING GRINDER AND POLISHING LATHE.

Improvements are constantly being made in the machinery employed in tire making, for example, the refinement of the buffing stand. The rough-looking, carelessly-built contrivances of cast iron and steel of former years have been replaced by well-designed machines, built of the best materials and according to modern methods of construction.

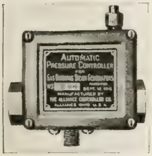


Tire-Buffing Stand.

The type here pictured is mounted on a rigid base measuring 20 by 28 inches. The steel spindle revolves in ball-bearings, and measures 1.77 inches in diameter at the bearings and 1.25 inches between the flange, while the length is 45.25 inches over all. It is belt driven from a counter-shaft and weighs 550 pounds net. (The Webster & Perk Tool Co., Springfield, Ohio.)

AUTOMATIC CONTROLLER FOR GAS HEATED MACHINES.

This device is primarily intended for repair vulcanizers but it is also designed for use on all other gas-burning steam generators, boilers, etc.



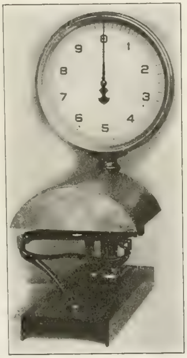
Steam Pressure Controller.

This attachment makes possible a constant and even steam pressure at all times and under all conditions. It allows a full flow of gas to bring the steam pressure to the desired point quickly and then automatically cuts down the flow of gas to the exact amount needed to hold that steam pressure. Once set, it requires no further attention. (The Alliance Controller Co., Alliance, Ohio.)

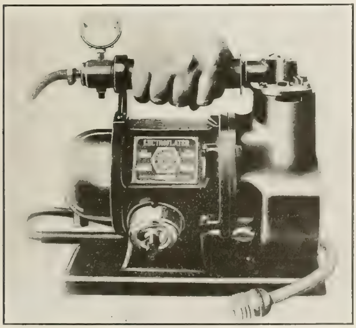
SCALES FOR AUTO TIRES AND TUBES.

Tire and tube factory methods include checking up the weights of finished tire carcasses and inner tubes to insure uniformity of product. This is usually done on ordinary scales that have been changed over for this particular purpose.

The accompanying illustration of a scale expressly designed for weighing inner tubes explains itself. For auto tires it is made in two capacities, 10 pounds, and 15 pounds, both weighing by one-half ounces. The dial of these scales is 13 inches in diameter, and fitted with a nickel-plated brass sash and glass measuring 15 inches over all. They are provided with oval-shaped brass platforms for conveniently holding the articles to be weighed. (John Chatillon & Sons, 85-95 Cliff street, New York.



Inner Tube Scale.



A Portable Tire Inflator.

THE HAND-TYPE LECTROFLATOR.

It is not at all surprising that the bulky tire-inflating apparatus so often seen in garages and service stations should be supplanted by a more easily handled device. But it was hardly expected that a light, easily operated and efficient machine of the hand-portable type would ever be serviceable as a practical tire inflator. However, the makers of the machine here shown confidently describe its construction and merits.

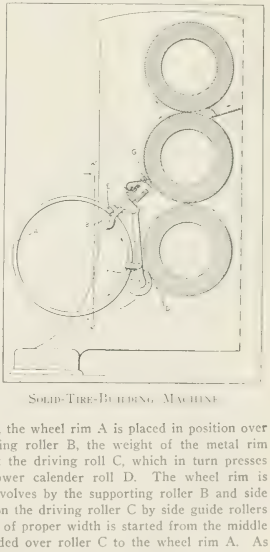
The two-piece cast-iron housing encloses the motor, gear-train and the compressor cylinder forming an air-jacket through which air is circulated by an enclosed fan. The piston and connection rods are of aluminum alloy and the piston is fitted with six ground piston rings. The puppet type valves are of brass with ground seats. The internal gearing, cylinder and shaft bearings are grease lubricated by positive systems.

The smallest machine has a capacity of two cubic feet of free air per minute, sufficient to inflate a 34 by 4 tire from flat to 80 pounds in 1 3-4 minutes. (The Black & Decker Manufacturing Co., Baltimore, Maryland.)

MACHINERY PATENTS.

MACHINE FOR FORMING SOLID TIRES.

The machine illustrated is designed to cut and apply to a solid tire base unvulcanized rubber to desired and gradually diminishing widths, placing the rubber on the rim automatically while holding and rotating the rim. The apparatus consists of a frame suspended opposite the lower rolls of a calender on which frame is mounted cutting disks, or knives, the sharp edges of which are held in loose contact with the middle calender roll carrying a thin sheet of unvulcanized rubber, from which they cut a strip of rubber. This strip is simultaneously carried to the wheel rim upon which it is continuously wound until the desired height is obtained.



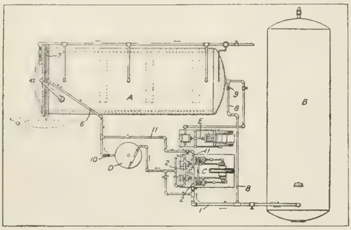
Solid-Tire-Building Machine

In operation, a supply of rubber having been prepared, the wheel rim A is placed in position over an off-center supporting roller B, the weight of the metal rim presses firmly against the driving roll C, which in turn presses firmly against the lower calender roll D. The wheel rim is held in place as it revolves by the supporting roller B and side guide rollers E and on the driving roller C by side guide rollers F. A strip of rubber of proper width is started from the middle calender roll and guided over roller C to the wheel rim A. As soon as the rubber is built up to the top of the wheel rim flanges the operator moves an eccentric cam lever, this raises a triangular cam which increases the distance between the rubber cutting knives G, making the next layer of rubber sufficiently wide to extend across the edges of the flanges. Each additional layer of rubber pushes up the triangular cam, permitting a spring to pull the knives closer together and making each layer a little

narrower than its predecessor until the proper amount has been placed on the rim. By setting the cutting knives at an angle the rubber may be cut on a bevel, thus building up the tire on a uniform slant. By using cams of different shape, tires may be built up with sides of various contours. (Robert McClenathen, assignor to Kelly-Springfield Tire Co., New York City, United States patent No. 1,312,491.)

PRESSURE-CURE FOOTWEAR VULCANIZER.

In vulcanizing rubber boots the chamber containing them is first freed from air and a vulcanizing medium in the form of a gas (*e.g.*, carbon dioxide) substantially devoid of free oxygen admitted. The chamber is heated by a steam jacket or interior steam coils and the gas is preheated and delivered to the chamber under pressure from a storage tank in which it is kept under pressure.



Footwear Vulcanizer.

Apparatus for this purpose comprises a chamber A, storage tank B for carbon dioxide, a compression pump C which may also act as a vacuum pump, a pre-heater D and a vacuum pump E. Pipes 8, 1, and 2 serve to pass gas which has entered chamber back to the pump C whence it traverses the preheater again and is thus circulated until the required temperature is reached. It is then sealed in the chamber by valves 9 and 10 and after vulcanizing returned to the tank B by pipes 7, 6 and 11 through the pump C. The compression pump is preferably duplex compression; one which steadily increases the pressure without intermittent reduction. (W. J. Mellersh-Jackson, 28 Southampton Buildings, London. [American Rubber Co., Boston, Massachusetts.] British patent No. 128,852.)

OTHER MACHINERY PATENTS.

THE UNITED STATES.

No. 1,213,026. Tire-stapling machine. A. A. Ewald, Oakfield, Wis.
1,312,029. Repair vulcanizer. E. Fetter, Baltimore, Md.
1,312,157. Collapsible core for tire molds. C. F. Buente, Avalon, Pa.
1,312,364. Repair vulcanizer. C. A. Shaler, Waupun, Wis.
1,312,438. Tire mold. H. H. Forrest, Kent, O.
1,312,505. Apparatus and method for making tires from pulley band structure. E. Hopkinson, New York City.
1,312,627. Mold for tire liners. J. H. Grube, assignor to Airsafe Inner Tire Co., both of Los Angeles, Calif.
1,312,878. Apparatus for impregnating fabric. J. E. and Peter D. Thropp, assignors to The De Laski & Thropp Circular Woven Tire Co., all of Trenton, N. J.
1,312,954. Machine for making insulated wire. W. E. Cook, New York City.
1,313,603. Deflater for inner tubes. R. McClenathen, Cuyahoga Falls, O., assignor to Kelly-Springfield Tire Co., New York City.
1,314,029. Gasket-trimming and finishing machine. C. L. Townsend, Norwood, O.
1,314,256. Apparatus for connecting and vulcanizing ends of tubes. W. C. Ehrenfeld, Flemington, N. J.
1,314,277. Air compressor with cleaning device. A. Loppacker, assignor to Eureka Air Compressor Co., both of Bloomfield, N. J.
1,314,344. Mold for vulcanizing hot-water bottles, etc. J. L. Mahoney, New Haven, Conn., assignor to The Goodyear's India Rubber Glove Manufacturing Co., Naugatuck, Conn. (Original application divided.)

THE DOMINION OF CANADA.

192,217. Tire-bead cementing and reeling machine. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of George McNeill, Detroit, Mich., U. S. A.
192,218. Tire-building machine. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of W. J. Steinle, Elmhurst Heights, N. Y., U. S. A.
192,219. Tire-bead-wrapping machine. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of G. McNeill, Detroit, Mich., U. S. A.
192,467. Tire making machinery. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of De Courcy Neal and A. O. Abbott, Jr., both of Detroit, Mich., U. S. A.

THE UNITED KINGDOM.

127,718. Means for locking together parts of a divided mold for use in molding rubber articles, such as balls, etc. C. H. Gray, India Rubber, Gutta Percha & Telegraph Works Co., Silvertown, London.
127,732. Lapping machine for covering wire spirally with insulating strips. C. J. Beaver, Rangemoor, Crescent Road, Hale, J. Stratton, The Lindens, Winton Road, Bowdon; and L. A. Claremont, Broom Cottage, High Legh—all in Cheshire.
127,970. Machine for cutting off marginal portions of pneumatic tires. North Western Rubber Co., Akron, O., U. S. A., and J. Torry, Hardwick, Park Drive, Blundellsands; H. R. Jones, 122 Litherland Road, Bootle, and J. Eastman, 9 Alexandria Mount, Litherland—all in Lancashire.
127,990. Special apparatus for making wheel tires. E. Hopkinson 1790 Broadway, New York City, U. S. A.
128,004. Mold for tire cover. E. Hopkinson, 1790 Broadway, New York, City, U. S. A.
128,114. Apparatus for building tire covers. E. Hopkinson, 1790 Broadway, New York City, U. S. A.
128,684. Apparatus for placing tires in molds, etc. Dunlop Rubber Co., C. Macbeth, and E. Sullivan, 14 Regent street, Westminster.
128,717. Machine for washing and masticating rubber. R. W. James, 11 Queen Victoria street, London.
128,777. Mold and process for making tires. E. Hopkinson, 1790 Broadway, New York City, U. S. A.
128,778. Apparatus for shaping and setting tire covers prior to final formation and vulcanization. E. Hopkinson, 1790 Broadway, New York City, U. S. A.

THE FRENCH REPUBLIC.

490,119. Vulcanizer. J. B. Stroud.
490,238. Vulcanizer. W. Reilly.
490,276. Improvements in machines for manufacturing rubber heels, soles, or shanks, and other similar articles. Société Wood Milne. Limited.
490,304. Mandrel for the repair of rubber tires for automobile wheels. G. Dugard.
491,932. Apparatus for molding and maintaining the shape of pneumatic tire casings. E. Hopkinson, 1790 Broadway, New York City, U. S. A.
491,933. Apparatus for the vulcanization of pneumatic tire casings. E. Hopkinson, 1790 Broadway, New York City, U. S. A.
491,934. Molds for pneumatic tires. E. Hopkinson, 1790 Broadway, New York City, U. S. A.
491,935. Molds for the vulcanization of tire casings. E. Hopkinson, 1790 Broadway, New York City, U. S. A.
491,936. Apparatus and process for the manufacture of pneumatic tires. E. Hopkinson, 1790 Broadway, New York City, U. S. A.
491,938. Machine for the manufacture of pneumatic tire casings. E. Hopkinson, 1790 Broadway, New York City, U. S. A.
492,105. Apparatus for tapping *Hevea* trees. J. Sajous.
492,250. Machine for mounting pneumatic tires. Michelin & Co.

PROCESS PATENTS.

THE UNITED STATES.

No. 1,312,770. Producing endless elastic bands. A. and H. J. Turner, Leicester, Eng.
1,313,286. Making cord bands for tires. J. R. Gammeter, Akron, O., assignor to The B. F. Goodrich Co., New York City.

THE UNITED KINGDOM.

128,722. Making solid rubber tires. Dunlop Rubber Co., 14 Regent street, Westminster, and C. Macbeth, Para Mills, Aston Cross, Birmingham.

THE FRENCH REPUBLIC.

491,931. Manufacture of pneumatic tire casings. E. Hopkinson, 1790 Broadway, New York City, U. S. A.
491,937. Manufacture of pneumatic tire casings. E. Hopkinson, 1790 Broadway, New York City, U. S. A.
492,254. Inflating balloons. A. Sauteraud.
492,144. Manufacture of galoshes. E. Den Doncker.

A NEW WATER GAME.

A new water game, similar to cage ball played on land, was recently introduced in one of the Y. M. C. A. natatoriums in Chicago. It is played with a large rubber ball, thirty inches in diameter, the object being to force it through the opponents' defense to the goal at the end of the tank.

New Goods and Specialties.

BLOCK'S SPIRAL SPRING FORCE CUP.

Dealers in kitchen utensils and household furnishings will be glad to know about the force cup shown here, which is suitable for use wherever the ordinary force cup could be used. In addition, it is claimed that this cup is particularly efficient because of its special construction. It is made of the best quality of rubber, with a spiral spring of oil-tempered steel inserted in the edge, and a thirty-six-inch wood handle finished to look like mahogany. The handle is recessed so that the clamp that holds on the force cup may secure it tightly. Both the clamp and the spring are sherardized, making them rust-proof. Besides making the force cup stronger and more efficient in use, the spiral spring helps it to maintain its shape. It is claimed that this cup has a force of about fifty-eight pounds, or thirty-six more than the ordinary four-inch one. (Cumming-Forster Corp., 220 South State street, Chicago, Illinois.)


Spiral Spring Force Cup.

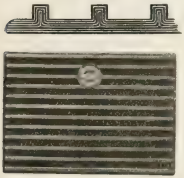
"REELASTIC" WINDS UP WITH A KEY.

The woman who uses elastic will be glad to know about the kind illustrated below. It winds up on the reel with a key when it is not in use and does away with the inconvenience of having to disentangle it from other articles in the sewing basket before it can be used. The new feature of this key-winding reel for elastic is the slot at the left of the key, which is marked with a scale to show how many yards of elastic are left out of the original twelve. (The American Mills Co. of New York, 395 Broadway, New York City.)

"Reelastic" Garter Webbing.

NEW STEP-PLATE.

A new type of service step-plate for the running-board of automobiles is made of rubber and fiber composition without metal inserts. The upper illustration of the two shown herewith indicates how the ribs of the tread are formed by a special process in which the long interwoven fiber follows the rib formation. It is claimed that this kind of step-plate does not get slippery in wet weather, like one of rubber only, and that the surface does not crumble and break off with continued wear; also that the device will not warp, spread, buckle, or rust, since no metal enters into its construction. (Service Rubber Co., 144 Oneida street, Milwaukee, Wisconsin.)


Single Unit Step-Plate.

TIRE SHOES AND RELINERS FROM PULLED FABRIC.

The vulcanizer and motorist are now being offered tire shoes and reliners made from high-grade "pulled fabric," etc., derived from specially selected tires originally built from Sea Island fabric and Pará friction. These are buffed, skived, and cut to fit, for the repair man, or painted and cemented ready for use. (The Lowenthal Co., 947 West 20th street, Chicago, Illinois.)

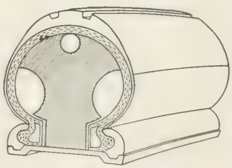
GOLF AND WEAR "SHIRTHOLDS."

A new device which dealers are finding profitable is called the "Shirthold." It consists of a strip of high-grade rubber four inches long, bearing rubber teeth similar to those of a rubber tooth-brush, but not so long; this strip is attached at each end to a safety pin. A pair of "Shirtholds" worn inside the trouser waist-band, directly over the hips, will, it is claimed, hold the shirt down and the trousers up in spite of strenuous action on the part of the wearer, at the same time acting as a cushion for a tight belt so that suspenders may be dispensed with. Being of rubber, the teeth will not injure the finest fabric. A patent has been granted on the invention. (The Shirthold Co., 324-328 Washington street, Green Bay, Wisconsin.)

The "Shirthold."

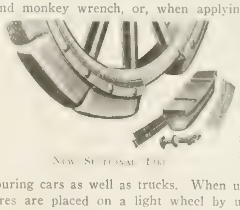
THE "TRIPLE AIRLESS"—A NEW TIRE.

Another development of the "airless" tire is illustrated below. The white spaces at the top and sides of the sectional view indicate shock-absorbing chambers which relieve the tire bridge. This bridge, in turn, is constructed so as to insure a perfect lock, while the beads are of extra heavy construction. The tire is frictioned by a method which is claimed to eliminate fabric separation, and a cushion of special quality is provided at the tread. (Triple Airless Tire Co., Manorville, Pennsylvania.)


"Triple Airless" Tire.

THE EDWARDS SECTIONAL SOLID CUSHION TIRE.

A tire for trucks has been devised that is made in sections. If one of these sections is injured in any way or wears out, it can be replaced without disturbing the others and without taking the wheel off the truck. The only tools required are a hammer and monkey wrench, or, when applying for the first time, an ordinary brace and bit in addition, for boring dowel holes into the felloe one-half inch in diameter and one-half inch in depth.


New Sectional Tire.

The sections, twelve in number, are made to fit standard S. A. E. wheels and can be applied to touring cars as well as trucks. When used on touring cars, the tires are placed on a light wheel by using a tire band which rests on six small lugs about one-quarter-inch from the wheel-band. (The Edwards Rubber Co., Akron, Ohio.)

A TOY SEAPLANE TO ASSEMBLE.

Some manufacturers who had the foresight to see how popular practical toys in line with the interests of the day would be, took advantage of the situation and developed

Lawrence Naval Seaplane.

specialties that have proved to be of more than temporary benefit to dealers who handle them. These include the airplane and the seaplane.

The seaplane shown above is 36 inches long assembled, and is equipped with a pair of 16-inch stream-line, hollow, single-step seaplane floats. The metal parts are aluminum and the wing covering, silk. The motor is a strong band of Pará rubber.

This toy may be purchased, assembled or knocked down. In the latter form it includes 145 separate parts which the ingenious boy will delight to put together with the help of the scale, working, drawing and instruction book which come with the parts. (Lawrence Airplane Model & Supply Co., 569 West Van Buren street, Chicago, Illinois.)

Coat of White Rubber. Stylish Raincoat.

A WHITE RUBBER COAT.

Those who desire a raincoat that is different will be sure to admire the one illustrated here, made of white rubber, trimmed with collar and cuffs of contrasting color and big pearl buttons. The armhole is large, with fitted sleeve, and there are two pockets.

Showerproof Riding Coat.

SHOWERPROOF RIDING COAT.

For those who ride in all weathers, a showerproof riding coat has been specially designed for comfort and service. In the back is a vent formed by a fan-shaped saddle extension which folds inward, while the front extension shown in the picture permits the coat to fall comfortably over the pommel of the saddle. This coat is made in rubberized silk or gabardine in light or olive tan. Both the white rubber coat and the showerproof riding coat are furnished by a prominent sporting goods house. (Abercrombie & Fitch Co., Madison avenue and 45th street, New York City.)

THE "LYNER TYRE."

A tire interliner, as its name implies, is constructed of especially strong, rubber-impregnated fabric, vulcanized over an aluminum mold, so that it fits the tire casing snugly without pinching the tube. The outside of the protector is lightly coated with rubber and a heavy layer of rubber cement which vulcanizes itself to the casing, eliminating slipping and possible friction. (Pelletier Rubber Co., Box 322, Cincinnati, Ohio.)

CLOTHES SPRINKLER.

"Even-Spray" Sprinkler.

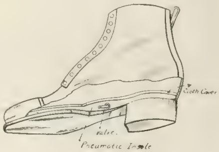
The "Even-Spray" clothes sprinkler utilizes the principle of any ordinary shaker with perforated top. In this case, however, the top is made of rubber so that it may be stretched to fit the neck of any bottle, preferably a round one which is easy to grasp. This sprinkler permits a more uniform and even application of water to the clothes to be sprinkled than can be accomplished by hand. The sprinklers are packed by the two dozen on display cards with easel backs. The cards themselves are packed in strong cartons which protect them from becoming soiled or broken. (The Elyria Specialty Co., Elyria, Ohio.)

A PRACTICAL RAINCOAT.

A good-looking, practical raincoat is illustrated at the right of the central picture. It is made of rubberized fabric in changeable color effect, with raglan sleeves and a simple turnover collar. A belt slips under side-straps formed by the extensions of the pocket overlaps and similar straps ornament the cuffs. The coat fastens in double-breasted style, with large buttons. (Holstein, Young & Co., 34 West 27th Street, New York City.)

PNEUMATIC INSOLE.

A pneumatic insole for shoes has been devised, which takes the form of a thin rubber sack covered with thin, tough cloth and paper. This sack is divided by transverse partitions perforated with small holes so that air can pass from one compartment to the next. A tiny valve is located in the instep, by means of which the insole may be inflated. If desired, a rubber tube with bulb attached may be fastened to the valve, the shoe may be put on and laced up, and the insole then inflated to suit the requirements of the wearer's foot.



Pneumatic Insole.

Thus a combined insole and arch support is formed, which it is claimed will cure soft corns and otherwise contribute to the comfort of the wearer, since the weight of the body is distributed evenly all over the sole instead of in certain spots only. This device is patented. (E. A. Spinney, 110 Ewing Apartments, Des Moines, Iowa.)

The Obituary Record.

BRITISH COMMERCIAL COMMISSIONER AT WASHINGTON.

IN THE PASSING OF SIR RICHARD CRAWFORD, the rubber trade of America loses one who rendered it conspicuous service during the troublous days of the Great War. Indeed had it not been for his fairness, foresight and infinite tact it is doubtful if rubber manufacture could have been continued except under great difficulty. What he did in rubber he also did in textiles and various commodities affected by the war. A very timely appreciation from the pen of A. M. Patterson of the Textile Alliance so well sums up Sir Richard Crawford's important work that we gladly give it in full:

The notices of the death of Sir Richard Crawford, which have appeared in the press on both sides of the Atlantic, have been so perfunctory that a few of his friends desire to make more generous recognition of the quality and importance of his work as Commercial Commissioner at the British Embassy during the War.

The first effect of the war on American commerce was to halt supplies of materials of which the British Empire was the principal or the only source. The extension of the contraband lists to include many articles always before free caused great resentment and aroused bitter criticism of the Government on whose naval and consular representatives fell the burden of enforcing the new rules.

When Sir Richard Crawford arrived in the United States in February, 1915, he found an acute irritation which it was his duty to relieve by the establishment of trade agreements and informal arrangements. They were then tolerated, but later recognized and subsequently in many cases taken over by the United States Government on its entry into the war. That they did not cause a breach was due in a large measure to Sir Richard Crawford. His tact in dealing with our citizens who did not understand and were reluctant to submit to restrictions which they believed our Government should actively resent, as well as his constant insistence on fairness to all and the correction of injustice, even when the aggrieved party had no legal case for redress, was continuing cause for admiration and respect to those behind the scenes. More than once his views placed him in opposition to his own Government's views; on at least two occasions he risked his influence at home, and on one occasion his entire career to carry his point, when he felt his country pledged to a course which others deemed inexpedient.

The same qualities which marked his dealings with the outside world made Sir Richard an ideal man to work with. He gave to his subordinates a full measure of consideration, authority and responsibility, and was rewarded by affectionate and efficient service. With those Americans who were associated with him he established a relationship which invariably became one of confidence and friendship, even though it may have begun on the American side with suspicion or resentment.

In addition to contraband, other subjects of great importance fell to Sir Richard. The supply of oil, finance, loans and arrangements, and the embargo upon the export of munitions which at one time seemed not improbable, were all in his province. In dealing with them he had the full confidence of his Ambassador and was himself in fact the Commercial Ambassador. Even before the United States entered the war his health was broken under so great a strain. Only flexible determination and the care of his wife enabled him to continue as he did for four years without intermission and practically without rest.

When completely broken health followed the death of Sir Cecil Spring-Rice and the end of the war, Sir Richard returned to England in the hope of a speedy recovery which would enable him to return to Washington, for he felt the need of sympathetic and wise management of the financial and commercial readjustments and the reestablishment of competition between the two countries and believed he could and should undertake it. He accepted a proffered post in Egypt only because he felt that he might find in that climate the strength which he could not regain in America. As late as last April he spoke of being able later to return to Washington and of his country's needs there, as the faithful servant who plans the full measure of service, although it was already plain that even Egypt was beyond his failing powers. In this fidelity he was a worthy representative of that class which has made the British Empire both at home and abroad the unchanging force that it has been for two hundred years, regardless of fluctuations of popular opinion or local politics.

As it turned out in serving his own country Sir Richard as well served the United States. The measure of it is known only to those closely associated with him, because of the manner in which he sank his personality in his mission.

Sir Richard Frederick Crawford, G. C. M. G., K. B. E., was born June 18, 1863. In 1904 he came prominently into public notice as Commissioner of Customs, a post which he held until 1911, when he was made a K. C. M. G. From 1911 until 1914 he was adviser to the Imperial Ottoman Ministry of Finance, and received the Grand Cordon of the Ottoman Order of the Medjudieh. When Turkey entered the war, however, he barely escaped from Constantinople with his life. On January 19, 1914, he was appointed a minister plenipotentiary in the diplomatic service, honorary rank. He was made Commercial Adviser to the British Embassy at Washington, D. C., November 15, 1914, and became Commercial Commissioner June 1, 1917. Three days later he was made a Knight Commander of the Order of the British Empire.

A PROMINENT TRENTON RUBBER MAN.

William Hall Servis, treasurer of the Hamilton Rubber Manufacturing Co., Trenton, New Jersey, died on September 19, 1919, at his home in that city after a long illness. He broke down from nervous prostration last April and was obliged to give up his work. A month ago his condition became worse and he was confined to his room until his death.

WILLIAM H. SERVIS.

Mr. Servis was born in Ringoes, Hunterdon County, New Jersey, January 6, 1855, being the son of Hiram and Sarah Servis. He was educated in the district schools and at a business college and for fourteen years was employed by the Buck Thorn Fence Co.

In 1896 he joined the Hamilton Rubber Co. and in time became its vice-president; in 1906 the Hamilton company bought the Combination Rubber Co. of Bloomfield, New Jersey, and Mr. Servis became president of that subsidiary. The success of the Hamilton Rubber Co. in recent years is attributed to the executive ability and the enterprising and progressive business methods introduced by Mr. Servis.

William H. Servis was a man of broad views, always interested in public questions. He was a member of the old Green Street, now the First Methodist Episcopal Church of which he was a trustee and treasurer. He belonged to Orpens Lodge No. 137, Free and Accepted Masons, of which

he was a Past Master and also to the Trenton branch of the Mystic Shrine. He was a member of the Trenton Country Club and gave much to charity. He leaves his widow, one son, Frank W. Servis, and two sisters.

ONE OF KELLY-SPRINGFIELD'S OLDEST EMPLOYES.

Announcement has been made of the death of H. P. Thompson, district manager for the Kelly-Springfield Tire Co., New York City, for the State of Texas.

H. P. Thompson.

Mr. Thompson was born in Texas about 33 years ago, and his entire business career was in that State. Previous to entering business he joined the United States Navy, serving as a gunner during the Spanish-American War, and seeing active service with the fleet at Santiago.

He then entered the employ of the Kelly-Springfield Tire Co. as salesman, working in Texas, under the St. Louis branch. As his business increased Dallas was made a branch, and he was appointed manager. Later, San Antonio and El Paso were made depot points, and he was appointed manager of the Texas district.

He is survived by his widow and mother.

PRESIDENT OF THE GOODYEAR RUBBER CO.

Frederick M. Shepherd, Jr., president of the Goodyear Rubber Co., New York City, died at his home in East Orange, New Jersey, September 17, aged 61 years.

Mr. Shepherd was a lineal descendent of Edward Shepherd, who came from England and settled in Cambridge in 1638. The father, Frederick M. Shepherd, was president of the Union India Rubber Co., in the early 'fifties, founder and president of the Goodyear Rubber Co. from 1872 to 1906, and president of the United States Rubber Co. from 1896 to 1902.

The son became connected with his father's enterprises in early life, and was secretary of the Goodyear Rubber Co., and succeeded to the presidency on the retirement of his father, carrying on the business in the same lines which had proven so successful. He also succeeded his father as president of the Orange Water Co., which was founded by the elder Shepherd, and held the same position with the East Orange Safe Deposit and Trust Co., which he was instrumental in establishing.

Mr. Shepherd is survived by his widow and three sons, one of whom, Newell C., is secretary of the Goodyear Rubber Co.

Sergeant Arthur W. Hazell, of the Royal Warwickshire regiment, who had been with the Dunlop Rubber Co., Birmingham, England, for fourteen years, died in August as a result of the after-effects of gas poisoning. He enlisted in 1915.

FINCK BARYTES PRODUCTION INCREASES

The Missouri Baryta Co., St. Louis, Missouri, of which C. P. DeLore, president of the J. C. Finck Mineral Milling Co. is president, has purchased approximately 4,500 acres of baryta land in Washington County, Missouri, comprising the second largest baryta producing property in Missouri. The new equipment being installed will double the output immediately and quadruple it within a year.

In connection with this increasing production the J. C. Finck Mineral Milling Co. has bought the complete stock and equipment of the Lambert Cooperage Works, St. Louis, and is moving them to the Fink plant. The Lambert works was one of the largest slack barrel plants in the city and had a capacity of 135 barrels per hour.

RUBBER INDUSTRIES ATHLETIC LEAGUE OUTING.

The first annual outing of the Rubber Industries Athletic League, an organization formed last spring among the employes of the eastern offices of the large rubber companies, came off Saturday, September 27. The steamer *Hendrick Hudson* of the Hudson River Day Line took the R. I. A. L. and friends, to Bear Mountain, where a delightful day was spent.

An exciting baseball game was played between the Sterling team, the winners of the R. I. A. L. tournament, and a picked nine from the teams it had defeated during the summer. The athletic games, which were keenly contested, included a 100-yard dash, a 440-yard run, a half-mile relay race, a three-legged race and a 50-yard dash for ladies. The day was thoroughly enjoyed by all who had the good fortune to take part in the excursion.

The first year's baseball competition of the Rubber Industries Athletic League has proved a great success, eight teams having been organized, which played to the close of the series. The number of competing teams will undoubtedly be larger next year.

The season ended on September 20, with the following result:

	Won.	Lost.	Percentage.
Sterling	17	2	.894
Goodyear	13	5	.722
United States Rubber	12	7	.631
Kelly-Springfield	12	8	.600
Firestone	7	8	.466
Globe	5	11	.312
Ajax	3	14	.176
Goodrich	1	15	.065

The Sterling team, which may be seen in uniform in the accompanying illustration, had to fight hard to establish its superiority and win the silver trophy cup presented by The India Rubber World, as well as the pennant presented by the Kelly-Springfield Tire Co. The second prize, the cup presented by

The Sterling Base-Ball Team, Winner of "The India Rubber World" Trophy Cup.

Left to right (standing): Otto Basten (manager of team and vice-president of the Sterling Tire Corp.); J. Messler, W. Thompson, H. Davis, J. B. Rourke (captain), W. Shary, S. Fredericks, and Spencer Welton (President of the Sterling Tire Corporation).

Seated, left to right: W. Stoltz (mascot), W. Jackson, J. B. Reynies, A. Roach and W. White.

Baker, Murray & Imbrie, was won by the Goodyear team after a close struggle with the United States Rubber and Kelly-Springfield teams, the issue being settled only on the last day. The names of the twelve players who made the best individual records, and so won the watch fobs presented by A. G. Spalding & Brothers will appear in the November number.

The officers of the R. I. A. C. for this year are:

President—P. C. Botzenmayer, United States Rubber Co.

Vice-President—H. A. Demarest, The B. F. Goodrich Rubber Co.

Secretary—J. L. Wood, Ajax Rubber Co., Inc.

Treasurer—Bartlett Greene, Sterling Tire Corp.

The companies which so far are represented in the Athletic League are: Globe Rubber Co., Keystone Tire & Rubber Co.,

Kelly-Springfield Tire Co., Miller Rubber Co., Pennsylvania Rubber Co., Sterling Tire Corp., United States Rubber Co., Ajax Rubber Co., Inc., Empire Rubber & Tire Co., Federal Rubber Co., Firestone Tire & Rubber Co., The Goodyear Tire & Rubber Co., The B. F. Goodrich Rubber Co.

THE EDITOR'S BOOK TABLE.

DETERMINATION OF FREE CARBON IN RUBBER GOODS. BY A. H. Smith and S. W. Epstein, assistant chemists, has been published as Technologic Paper No. 136 of the Bureau of Standards.

THE details of the method described in the above pamphlet were published in THE INDIA RUBBER WORLD, January 1, 1919, page 197.

"STUBBS BUYERS' DIRECTORY FOR THE WHOLESALE DRUG, Chemical and Allied Trades"; 388 pages, 6 by 9 inches. Alfred Stubbs, New York.

The 1919 edition of this standard work is "a classified list of manufacturers, importers and first hand wholesalers" and lists such materials as anilines, chemicals, dyestuffs, drugs, gums, oils, essential oils, and crude and raw materials, for manufactures in important industrial chemical lines, including rubber manufacturers.

DYKE'S AUTOMOBILE AND GASOLINE ENGINE ENCYCLOPEDIA. By A. L. Dyke, E.E. Tenth edition. A. L. Dyke, St. Louis, Missouri. (Cloth, large octavo, 940 pages, profusely illustrated.)

The tenth edition of this voluminous work on the construction, operation and repair of automotive vehicles and gasoline engines of all sorts has made its appearance thoroughly brought up to date and containing, in addition to the sections on automobiles, trucks and motorcycles, much new material on tractors and airplanes. Two sections, comprising 27 pages, are devoted to tires and tire accessories of all sorts, the use, care and repair of tires, rims, air pumps, compressors, etc. Hundreds of half-tones, diagrams, charts, inserts, a comprehensive index and numerous supplements illustrate the text, and altogether the volume provides a remarkable compendium of ready reference for the motorist, cyclist and aviator.

NEW TRADE PUBLICATIONS.

"PNEUMATIC TIRE VALVE WRINKLES" IS THE TITLE OF a 43-page cloth-bound book, vest-pocket size, published by A. Schrader's Son, Inc., Brooklyn, New York. Although compiled primarily for the use of the various branches of the United States Army and Navy, it is of value to every motorist and cyclist, acquainting him in a concise manner with all that it is necessary for him to know about tire valves, various allied accessories and their care, proper tire inflation, ascertaining air pressure, etc.

* * *

"THE STORY OF THE TIRE" IS THE TITLE OF A VERY INTERESTING and instructive 67-page illustrated booklet published for distribution by The Goodyear Tire & Rubber Co. Beginning with the many uses of rubber and the discovery of vulcanization by Charles Goodyear, it recounts the growth of the Goodyear business, describes the great manufacturing plant at Akron, Ohio, the rubber plantations in Sumatra, the cotton plantations in Arizona and the fabric mills in Connecticut. How rubber is grown and prepared for market, and how it is used in the manufacture of tires of various sorts are concisely detailed. Altogether it is an exceptional piece of trade publicity.

* * *

BLACK & DECKER, BALTIMORE, MARYLAND, HAVE ISSUED A handsome 32-page catalog of their Lectroflaters, electric air compressors, portable electric drills and electric valve grinders. The Lectroflaters are made in numerous forms for private and garage use, ranging from small hand and wall devices to stationary and portable tank outfits. The air compressors are for pneumatic truck-tire inflation and operating pneumatic tools, etc.

DEPARTMENT OF COMMERCE BULLETINS, MISCELLANEOUS SERIES No. 81. "Selling in Foreign Markets," by Guy Edward Snider. In a volume of 637 pages the Bureau of Foreign and Domestic Commerec and the Federal Board for Vocational Education have combined to provide the American business world with information that may enable it to enter foreign markets with some chances for success. The information covers export sales problems, the export middleman, traveling salesmen, correspondence, catalogs, and advertising. There is a chapter on credits and one on delivery, packing, etc., making the book as a whole well worth reading by all who are planning to do business with foreigners.

* * *

The *"Bulletin de l'Association des Planteurs de Caoutchouc,"* published at Antwerp, Belgium, comes to life again after a silence of five years during the German invasion. It announces that it must double its price and that it will deal with all tropical products as well as with rubber. These products will be taken into its rubber museum also, which luckily escaped the notice of the invaders and is nearly intact. Among other interesting articles, some of which are finely illustrated, is one on the rules of the Antwerp rubber futures market. The artistic colored cover shows a Malayan tapping a rubber tree.

* * *

"THE TRANS-PACIFIC," A FINANCIAL AND ECONOMIC MAGAZINE of international service, published at Tokio, Japan, is a new publication which has just come to hand. It is a large, well-printed magazine having for its object to bring into closer business relations the activities and enterprises of the United States with those of the Far East and Australasia. A number of prominent industries of China, Japan, the Philippines, Australia, and Siberia are described, with ample illustrations in this number.

The editorial staff and contributors include several prominent business writers and officials in the Eastern countries. The main portion of the magazine is printed in English, but there is a Japanese section in charge of an editor of an influential magazine in Japan, and a Chinese section edited by a student of economic affairs in China and other Far Eastern countries. The magazine starts out with the promise of being both interesting and useful to American houses catering to foreign trade.

* * *

A NEW TIRE JOURNAL. UNDER THE EXCELLENT NAME, "Tires and Accessories" (Edward Lyman Bell, Inc., 373 Fourth avenue, New York City), a new journal makes its bow to the trade. It is evident from its leading articles, its wealth of trade news and its excellently arranged Table of Comparative Tire and Tube Prices that it aims to interest and assist distributors. The field is big and fertile and the initial number one of much promise. May success and its accessories attend it.

MEETING OF THE SCRAP RUBBER DIVISION OF THE NATIONAL ASSOCIATION OF WASTE MATERIAL DEALERS.

The meeting of the Scrap Rubber Division of the National Association of Waste Material Dealers was held at the Hotel Astor, New York City, on September 16. David Feinberg presided in the absence of Chairman Muehlstein.

A committee appointed to confer with the Rubber Reclaimers' Division of the Rubber Association of America with reference to the payment of interest on overdue accounts made its report. It has sent a letter to the Rubber Reclaimers' Division proposing that 6 per cent interest be allowed for any overdue period.

CHARLES E. MILLER, ANDERSON RUBBER WORKS, ANDERSON, Indiana, is building a three-story and basement addition of brick and concrete, 108 by 108 feet, to be used largely in the manufacture of tires, vulcanizers and other rubber-working machinery.

PENNSYLVANIA RUBBER CO. BUILDING HOMES.

The Pennsylvania Rubber Co., Jeannette, Pennsylvania, has recently purchased a tract of approximately 120 acres adjacent to its plant, and is plotting it out in streets now being graded, dividing it into about 600 house lots, on which it is erecting houses of modern design and construction. Twelve of these houses are already built, and 33 are now in course of construction, to be completed next month. They are attractive and commodious, of stucco and brick, with up-to-date arrangements for lighting and heating. They are offered to the employes on liberal terms and are being taken so fast that the company will continue the erection of still more homes to solve the problem of housing its employes.

Homes For Pennsylvania Rubber Co.'s Workmen.

NEW INCORPORATIONS.

Acme Tire & Rubber Co., August 5 (Wisconsin), $100,000. O. M. and J. M. Carter; A. Loell, Sr. Principal office, Milwaukee, Wisconsin. To manufacture and repair tires and tubes.

Acorn Tire & Rubber Co., Inc., August 25 (Delaware), $1,000,000. M. C. Kelly; S. L. Mackey; J. D. Frock—all of Wilmington, Delaware. Delaware agent, Delaware Charter Guarantee & Trust Co., Du Pont Building, Wilmington, Delaware. To manufacture and deal in rubber and gutta percha.

Admoral Tire & Rubber Co., Inc., September 12 (New York), $2,000. J. Jacobs; S. Bernheim; W. Loewenthal—all of 1877 Broadway, New York City. To manufacture tires, etc.

Aero Cushion Inner Tire & Rubber Co., May 17 (Michigan), $500,000. B. A. Herrington, president; E. L. Sherbondy, vice-president; J. J. O'Shannessy, secretary; C. E. Judson, treasurer; Dr. E. T. Grosvenor. Principal office, 909 Ford Building, Detroit, Michigan. To manufacture and sell Aero cushion inner tire, automobile casing, bicycle tires, rubber heels, rubber cushions, rubber bumpers and other commercial rubber products.

All-In-One Auto & Tire Co., September 8 (Delaware), authorized capital 1,000 shares without nominal or par value. W. F. O'Keefe; G. G. Steigler; J. H. Dowdell—all of Wilmington, Delaware. Delaware agent, Corporation Co. of Delaware, 901 Market street, Wilmington, Delaware. To manufacture and deal in automobile tires and tubes.

Canion Rim Co., August 15 (Maryland), capital stock of 500 shares preferred stock at $10 per share and 1,000 shares common stock without any par value. W. R. Gunn; L. Stille; E. E. Johnson—all of 563 Calvert Building, Baltimore, Maryland. Principal office, 563 Calvert Building, Baltimore, Maryland. To manufacture, buy, sell and deal in rims to be used on automobile wheels and other vehicles.

Compression Tube & Tire Corp., August 29 (Delaware), $600,000. T. L. Croteau; H. E. Knox; S. E. Dill—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture and deal in tires and inner tubes.

Dilator Syringe Foreign Rights Corp., September 4 (Delaware), authorized capital, 10,000 shares without nominal or par value. A. W. Britton; P. L. Nieser; W. R. Randall—all of 65 Cedar street, New York City. Delaware agent, United States Corporation Co., 311 South State street, Dover, Delaware. To manufacture and deal in domestic and foreign patents in and for syringes and all other articles of a similar nature.

F. M. Tire & Repair Co., Inc., September 13 (New York), $15,000. W. B. McLaughlin, 335 Virginia street; E. H. Fahmer, 149 Rodney avenue; E. W. Studt, 299 Highland avenue—all of Buffalo, New York. Principal office, Buffalo, New York. To deal in tires.

Galion Rubber Co., The, May 5 (Ohio), $25,000. J. N. Smeltzer, president and treasurer; E. F. De La Croix, vice-president; J. Kostler, factory manager. Principal office, 20 East 17th street, New York City. Factory, Galion, Ohio. To manufacture rubber drug sundries and novelties.

Goodyear Tire & Rubber Co. of California, July 11 (California), $20,000,000. H. Chandler; J. C. Drake; L. A. Phillips; J. F. Sartori. Principal office, Los Angeles, California. To manufacture tires, etc.

Hibbs Rubber Co., The, July 14 (Texas), $100,000. G. H. Calvin, Fort Worth; R. L. Davidson, Greenville; T. B. King, Houston—all of Texas. Principal office, Fort Worth, Texas. To manufacture auto tires, tubes and machinery.

Hirsch & Co., Inc., Adolph, August 18 (New York), $2,000,000. A. Hirsch, president, I. H. Hirsch, vice-president and treasurer, A. A. Glass, secretary. Principal office, 53 Park Row, New York City. To import rubber and other products from Brazil.

Independent Tire Co., August 4 (Kentucky), $35,000. G. R. Davis; J. G. Rehkopf, Sr.; A. G. Oakley; E. J. Paxton—all of Paducah, Kentucky. Principal office, Paducah, Kentucky. To manufacture tires and tubes.

K. & S. Rubber Products Co., Inc., August 12 (New York), $5,000. L. C. and A. J. Wilckens, both of 6939 Ridge Boulevard; C. J. Wolters, 428 Ovington avenu—all of Brooklyn, New York. To deal in rubber goods.

Klaus-Morr Battery & Tire Co., Inc., September 6 (New York), $3,000. E. S. Klausner, 2194 Seventh avenue, New York City; L. A. Morrison, 17 Vista avenue; J. S. Neidich, 247 South Broadway—both of Yonkers, New York. To deal in tires.

London Rubber Co., August 27 (Pennsylvania), $100,000. A. L. and H. London; A. C. Teplitz—all of Pittsburgh, Pennsylvania. Principal office, 906 Forbest street, Pittsburgh, Pennsylvania. To manufacture rubber cloths, raincoats and inner tubes.

Mendenhall Resilient Wheel Mfg. Co., August 25 (Delaware), $3,000,000. T. L. Croteau; H. E. Knox; S. E. Dill—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture and deal in vehicle wheels and resilient, elastic and spring wheels of all kinds.

Middleetown Rubber Co., Inc., September 6 (New York), $1,000,000. J. T. MacDonald; M. J. Friedman—both of 280 Broadway, New York City; S. A. Thompson, Middletown, New York. To manufacture rubber goods and druggists' sundries.

Norwalk Tire Sales Co., Inc., September 11 (New York), $10,000. R. J. Gleichauf; L. A. Arentz; F. P. Surgenor—all of 174 State street, Albany, New York. Principal office, Albany, New York. To deal in tires.

Nu-Tred Tire & Rubber Co., August 6 (New York), $100,000. C. F. Hughes, 61 Broadway; C. G. Wheeler, 26 Liberty street; F. G. Ricker, 150 Nassau street—all of New York City. To deal in and repair tires.

President Suspender Co., The, August 15 (Massachusetts), $400,000. J. M. Foster; F. C. Gray; J. F. Rollins—all of 60 State street, Boston, Massachusetts. Principal office, Shirley, Massachusetts. To manufacture and deal in suspenders, garters, webbing, etc.

Puritan Rubber Manufacturing Co., August 21 (New Jersey), $250,000. F. Berenstein, Chelsea; W. Berenstein, Jamaica Plain; M. Marcus Stoughton—all of Massachusetts; T. Gordon, Windsor Hotel, Trenton, New Jersey. Principal office, foot of Perrine avenue, Trenton, New Jersey. Agent in charge, T. Gordon. To manufacture, produce, buy, sell, export, import and generally deal in rubber and gutta percha.

Rubber Products Ltd., February 12 (Canada), $50,000. H. J. Haslett, president and vice-president; W. H. Coste, managing director; A. E. Salsbury, secretary and treasurer; H. H. Clarke, director. Principal office, 105 Winch Building, Vancouver, B. C., Canada. To manufacture rubber goods.

Rubber Securities Co., July 23 (New York), $10,000. J. Traphagen; F. J. Lumsden; P. F. Lorzer—all of 149 Broadway, New York City. To deal in rubber securities, etc.

Simpson & Wren, Inc., September 9 (New York), $2,500. J. P. Simpson, 796 East 4th street, Brooklyn, New York; C. F. Wren, 92 Morningside avenue, New York City; W. H. O'Neill, Weehawken, New Jersey. Principal office. Rockville Centre, New York. To manufacture tires, etc.

Sinclair Rubber Co., Inc., September 9 (New York), $25,000. C. M. Pyle, 106 East 85th street; I. Solomon, 616 West 207th street; E. P. Brown, 152 East 90th street—all of New York City. To deal in tires.

States Tire & Service Co., August 28 (Delaware), $10,000. R. E. Nolan, 224 Railroad avenue; J. T. Hanlon, 462 Railroad avenue; A. Brown, 1417 Pittston avenue—all of Scranton, Pennsylvania. Delaware agent, Capital Trust Co. of Delaware, Dover, Delaware. To repair automobiles, automobile tires, and to sell automobile supplies, parts and accessories.

Swaney & Blanchard, Inc., September 19 (New York) $25,000. C. R. and D. P. Swaney, both of Westfield, New Jersey; G. A. Blanchard, 790 Riverside Drive, New York City. To manufacture tires and rubber goods.

Welfare Tire & Rubber Co., Inc., August 27 (New York), $5,000. J. Jacobs; S. Bernheim; W. Loewenthal—all of 1877 Broadway, New York City. To manufacture tires.

MOTOR ACCESSORY MANUFACTURERS' CONVENTION.

Sane optimism was the keynote of the third annual credit convention of the Motor and Accessory Manufacturers' Association at the Hotel Lafayette, Buffalo, New York, September 11 and 12. This attitude was almost unanimously reflected by the attendance of approximately 150 representative executives of the industry, including credit managers and general officers of leading automotive equipment companies throughout the country.

Although the two-day business sessions were devoted primarily to credit subjects, general conditions in the business world, and particularly the automotive industry, were discussed from all angles.

H. A. Tongue, credit manager of the Firestone Tire & Rubber Co., Akron, Ohio, was among the several speakers who discussed in great detail the broad and far-reaching usefulness of the association's credit department. Other rubber men in attendance were W. O. Rutherford, vice-president of The B. F. Goodrich Co., Akron, Ohio, also C. B. Reynolds, V. I. Montenyohl, W. I. Fornof, and E. S. Sargeant of the Goodrich company; W. D. Skinner, Republic Rubber Co., Youngstown, Ohio; N. S. Conover, Empire Rubber & Tire Co., Trenton, New Jersey; J. A. Lyons, Kelly-Springfield Tire Co., New York City; J. M. Tait, Federal Rubber Co., Cudahy, Wisconsin; W. B. Keiser, The Fisk Rubber Co., Chicopee Falls, Massachusetts; and G. Brewer Griffin, Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania.

News of the American Rubber Industry.

DIVIDENDS.

The Ajax Rubber Co., Inc., New York City, has declared a quarterly dividend of $1.50, which was payable September 15 on stock of record August 30, 1919.

The Apsley Rubber Co., Hudson, Massachusetts, has declared its semi-annual dividend of three and one-half per cent, payable October 1 on common stock of record September 30, 1919.

The American Chicle Co., New York City, has declared its quarterly dividend of one and one-half per cent, payable October 1 on preferred stock of record September 21, 1919.

The Firestone Tire & Rubber Co., Akron, Ohio, has declared its regular quarterly dividend of one and one-half per cent, payable September 20 on common stock of record September 21, 1919.

The General Electric Co., Schenectady, New York, has declared its quarterly dividend of two per cent on stock of record September 15, payable October 15, 1919.

Globe Rubber Tire Manufacturing Co., Trenton, New Jersey, has declared its quarterly dividend of one and one-half per cent payable September 15 on stock of record August 3, 1919.

The B. F. Goodrich Co., Akron, Ohio, has declared its quarterly dividend of $1 a share, payable November 15 on common stock of record November 5, 1919.

The Kelly-Springfield Tire Co., New York City, has declared its quarterly dividend of $1.50 per share, payable October 1 on its six per cent preferred stock of record September 15, 1919.

The Keystone Tire & Rubber Co., New York City, has declared a stock dividend of fifteen per cent, payable September 15 on stock of record September 2, 1919.

The Pennsylvania Rubber Co., East Pittsburgh, Pennsylvania, has declared its regular quarterly dividend of 1¾ per cent on preferred stock and 1½ per cent on common stock, payable September 30 on stock of record September 15, 1919.

The Plymouth Rubber Co., Canton, Massachusetts, declared its quarterly dividend of $1.75 a share, payable September 2, on preferred stock of record August 5, 1919.

The Portage Rubber Co., Akron, Ohio, has declared its quarterly dividend of one and three-quarters per cent, payable October 1 on preferred stock of record September 20, 1919.

The Tyer Rubber Co., Andover, Massachusetts, declared its quarterly dividend of $1.50 per share, payable August 15, 1919, on preferred stock.

The United Shoe Machinery Corp., Boston, Massachusetts, has declared quarterly dividends of $1 a share on common stock and 37½ cents a share on preferred stock, payable October 4, on stock of record September 16, 1919.

FINANCIAL NOTES.

H. S. Firestone, president of the Firestone Tire & Rubber Co., in his annual address to the directors of the company on September 5, 1919, explained why the capitalization has been raised to $75,000,000. Said he:

It is less than three years ago that we increased our preferred stock from $1,000,000 to $10,000,000. At that time we had no idea of ever using more than $5,000,000 of that preferred issue, and with that experience in mind and not knowing what the future might bring forth, we decided to make our preferred capital stock sufficiently large so that we could without expense and complications issue more at any time, and therefore it seemed advisable to raise from $10,000,000 to $50,000,000. It is necessary to have half as much common stock as preferred, and therefore it was necessary to increase the common stock to $25,000,000. We do not intend to make any issue of common stock at this time, and when we do sell it we hope that it may be possible to offer the common stock to our employes.

The August sales of the Firestone Tire & Rubber Co., amounted to $10,000,000. The entire sales of the company in 1911 were only $7,462,000. In other words, in the single month of August the company billed out 33 per cent. more goods than for the full year 1911. For the full year to October 31 next, Firestone will easily do $90,000,000 of business and for the following fiscal year, making allowance for the effect of the expansion program, gross should considerably overtop the $100,000,000 mark.

* * *

With a turnover in excess of $5,000,000, The Fisk Rubber Co. had in August the biggest month in its history. Its subsidiary, Federal Rubber, also reached a new sales mark of $1,500,000. The Fisk Rubber system therefore did a total business last month of $6,500,000 or at the annual rate of $78,000,000. In this connection it is interesting to note that actual sales of the parent company alone last year were but $36,000,000. The operating profits of both companies last month were close to $1,000,000, which charge-offs may reduce to approximately $800,000. The Fisk earning power has more than kept pace all year with sales expansion and has now reached the point where it is forcing upon directors the necessity of considering common dividends.

* * *

The Republic Rubber Co.'s gross sales for September which are expected to exceed $2,000,000, are running at a rate greater than at any other time in the history of the company. Indebtedness which falls due on October 1, has been anticipated with the result that the company's statement as of that date will for the first time in many years show current assets twice all current liabilities.

* * *

With an increase of approximately 56 per cent in sales volume for the first seven months in 1919, as compared with the same period in 1918, The Miller Rubber Co. shows every indication of breaking all of its previous records at the end of this year. The company did approximately $16,000,000 business in 1918, and a $23,000,000 figure was set for 1919. From present indications, the latter mark will be passed easily.

An $800,000 increase in Miller common capital stock has been authorized. Stockholders may subscribe to new stock at $100 par on a basis of one-fifth of their holdings. Miller common has been selling at better than $200 for several months.

* * *

United States Rubber stockholders have ratified the plan calling for increase in capital from $70,000,000 first preferred and $40,000,000 common to $100,000,000 first preferred and $200,000,000 common. Out of 630,221 shares preferred outstanding, 440,026 voted for the plan and out of 360,000 shares common, 309,372 voted in favor.

The committee on securities of the Stock Exchange has ruled that transactions in common stock of United States Rubber Co. on September 12 shall be ex-rights unless made specifically for cash. Rights may be dealt in on and after September 11.

* * *

The capitalization of the Nebraska Tire & Rubber Co., Omaha, Nebraska, is $500,000 of which $300,000 is preferred, guaranteed 7 per cent. dividends, and $200,000 common. No common stock has been offered for sale.

The balance sheet of the Ajax Rubber Co., Inc., June 30, 1919, compared with that of 9118, follows:

Assets	1919.	1918.
Cash	$761,365	$581,040
Bills receivable	....	58,814
Liberty bonds, etc.	234,923	183,023
Accounts and notes receivable	4,877,150	4,979,223
Deferred assets	100,175	220,544
Inventories	6,539,780	5,126,638
Good will	1,874,875	1,874,874
Investment account	2,573	13,647
Plant, equipment, etc.	2,223,184	2,510,457
Total	$16,614,026	$15,548,260
Liabilities		
Capital stock	$8,200,000	$7,100,000
Accounts payable	1,697,721	1,267,989
Notes and loans payable	2,900,000	....
Bills payable	....	4,015,000
Reserves	1,285,894	862,822
Surplus	2,530,411	2,302,449
Total	$16,614,026	$15,548,260

The following comparative report is for six months ended June 30, 1919:

	1919.	1918.	Increase.	Decrease.
Net earnings	$1,886,730	$1,959,608	....	$72,878
Dividends	488,528	426,000	$63,528	....
Surplus	1,398,202	1,533,608	....	135,406

* * *

The following table shows the authorized capitalization of six of the large rubber companies on January 1, 1918, present authorized capitalization and amount of increase:

	Authorized Capital Jan. 1, 1918.	Present Authorized Capitalization.	Increase.
United States Rubber	$120,000,000	$300,000,000	$180,000,000
Goodrich	84,600,000	109,600,000	25,000,000
Kelly-Springfield	13,900,300	20,900,300	7,000,000
Firestone	15,000,000	75,000,000	60,000,000
Fisk	39,500,000	42,000,000	2,500,000
Ajax	*7,100,000	*9,900,000	2,800,000

* Amount issued. Authorized capitalization of $10,000,000 unchanged.

RUBBER COMPANY SHARE QUOTATIONS.

The following rubber stock quotations on September 22, 1919, are furnished by John Burnham & Co., 41 South La Salle street, Chicago, Illinois:

	Bid.	Asked.
Ajax Rubber Co., Inc.	88	89
Brunswick-Balke-Collender Co., preferred	103	...
du Pont de Nemours & Co., E. I., common	314	319
Firestone Tire & Rubber, common	177	182
Firestone Tire & Rubber, preferred	99½	101½
Fisk Rubber Co., The, common	43½	44½
Fisk Rubber Co., The (new), 1st preferred	99	101
Fisk Rubber Co., The, 2nd preferred	170	190
Goodrich Co., The B. F., common	77	78
Goodrich Co., The B. F., preferred	103½	104½
Goodyear Tire & Rubber Co., The, common	380	390
Goodyear Tire & Rubber Co., The, 1st preferred	106½	108½
Goodyear Tire & Rubber Co., The, 2nd preferred	107	109
Portage Rubber Co., The, common	144	148
Kelly-Springfield Tire Co., 1st preferred	95	97
Lee Tire & Rubber Co.	29½	30½
Marathon Tire & Rubber Co.	...	85
Miller Rubber Co., The, common	190	200
Miller Rubber Co., The, preferred	103	106
Rubber Products Co.	138	143
Portage Rubber Co., The, common	144	148
Swinehart Tire & Rubber Co.	90	95
United States Rubber Co., common	112	113
United States Rubber Co., preferred	116½	117½

A FEW TIRE, AUTOMOBILE AND ROAD FACTS.

It is estimated that there were 7,000,000 automobiles in the world on January 1, 1919, and by actual count 6,146,677 of these, or about 87 per cent were in the United States—enough, if loaded to capacity, to give half the population of the country a ride at one time. This means that of some 38,500,000 tires now in constant use, about 34,000,000 are to be found in this country. Each of these six million odd cars, when operated on unimproved roads, costs twice as much for tire maintenance as when operated on surfaced roads, and there are approximately eight times as many miles of unimproved as of improved public roads in the United States. Of a total mileage of 2,457,334 only 296,290 miles are surfaced. The Department of Agriculture anticipates that expenditures for road construction will reach $500,000,000 this year. Most states are planning continuous systems of connecting highways, and Congress has made an extra appropriation of $209,000,000 to meet the Federal part of the program. All of which means that average tire mileage is going to increase appreciably. Automobile men predict that the first of next year will see more cars in America than there were in the whole world the first of this year, so that the business of tire manufacture must continue to grow in order to keep pace with the increasing demand.

TRADE NOTES.

The Atlantic Rubber Manufacturing Corp., sales agent for Traun Rubber Co., 239 Fourth avenue, New York City, has increased its capital stock from $15,000 to $300,000.

The Traveler Rubber Co. of Bethlehem, U. S. A., 819 North Broad street, Philadelphia, Pennsylvania, has awarded the contract for its one-story plant, 91 by 333 feet, to be built in Lower Saucon Township, near Bethlehem, Pennsylvania, at an estimated cost of $180,000, including equipment.

The Smith Chemical & Color Co., Inc., which was formed recently, will carry a general line of standard dry pigment colors, chemicals and fillers for the rubber trade. Casper Smith, whose portrait is shown herewith, was formerly connected with the Katzenbach & Bullock Co. as western manager and more recently as director of sales, is the president of the new company, and will personally supervise its business policy. The office of the new concern is located at 116 Nassau street, New York City.

CASPER SMITH.

The Beacon Tire Co., Beacon, New York, will build an addition to its factory to meet the increasing demand for its products.

The Plymouth Rubber Co., Canton, Massachusetts, has opened an office in the Everett Building, 45 East 17th street, New York City, in charge of E. J. Hooper. Mr. Hooper has been with the company for the last twelve years.

The Rebuilt Tire Co., Inc., 910-916 Second avenue, Long Island City, New York (see New Incorporations, THE INDIA RUBBER WORLD, September 1, 1919), will rebuild and retread tires and make pulled reliners for the trade. Charles D. Nolan is president; Charles F. Nolan, vice-president; E. L. Blessington, secretary, and Erich Gollubier, treasurer.

The Alling Rubber Co., 1126 Main street, Bridgeport, Connecticut, is building an extension to its store, to cost about $25,000. Its premises will be nearly 200 feet deep when the work is completed, with fronts on both Main and Middle streets.

The Goodyear Cotton Mills, Inc., Killingly, Connecticut, are completing the building now being erected for a restaurant for employes. The structure is one story in height, 50 by 100 feet, of brick, and will accommodate between 175 and 200 people on the cafeteria plan, by which it will be operated.

The Franklin Soapstone Products Corp., which was incorporated about four years ago to work the deposits of talc in and around Danville and Saltville, Virginia, has recently completed its plant, and has a present capacity of 100 tons daily, but when further machinery now on hand is installed will increase its output to 150 tons per ten-hour day. The talc or soapstone is of a soft, velvety texture, and there is some of a blue, compact nature. The company proposes to pack its finer quality in small cartons for dusting powders for the tire trade.

PERSONAL MENTION.

H. L. McClaren, formerly president and general manager of the Ajax Rubber Co., Inc., New York City, and the Racine Rubber Co., Racine, Wisconsin, has divested himself of all other interests and purchased a substantial holding in the J. & D. Tire Co., Charlotte, North Carolina, of which he was recently elected president and active general manager, succeeding William F. Smith, who resigned in his favor. Additional equipment is to be installed to allow increased production, and additions to the plant itself are to be built. In addition to its present product, the company is planning to manufacture cord tires and will install special equipment for this purpose. It is hoped that the production of these can be started in the autumn.

H. L. McClaren.

A. J. Sobien, formerly secretary and treasurer of The Anchor Rubber Co., Barberton, Ohio, has resigned and become associated as a director with the newly organized Virginian Rubber Co. at Charleston, West Virginia.

P. A. Doyle, formerly general sales manager for the Ten Broeck Tyre Co., Louisville, Kentucky, has recently resigned and accepted the position of manager of the central district of the International India Rubber Corp., South Bend, Indiana, with headquarters at Kansas City, Missouri.

Harry M. Giles has been appointed general superintendent of the South Philadelphia Works of the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania. He succeeds the late Oscar Otto, killed in an automobile accident in August. For a number of years Mr. Giles has been superintendent of marine erection for the company.

E. T. Peterson, formerly district sales manager for the Commercial Car Unit Co., Philadelphia, Pennsylvania, has been appointed manager of the Pennsylvania Rubber Co., Jeannette, Pennsylvania, with headquarters at Buffalo, New York.

R. B. Pierce has been promoted to the position of district manager of the Kelly-Springfield Tire Co., with headquarters at 4600 Prospect avenue, Cleveland, the office of the company's Cleveland branch.

Alf P. Fischley has been appointed manager of the Kelly-Springfield Tire Co., 4600 Prospect avenue, Cleveland, succeeding R. B. Pierce.

C. O. Brandes has been appointed export manager for The Ideal Tire & Rubber Co., Cleveland, manufacturer of "Greyhound" tires and tubes.

J. C. McQuiston, manager of the department of publicity of the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, served as chairman of the exhibition committee of the Pennsylvania Electric Association which held its annual convention at Bedford Springs, Pennsylvania, on September 3-6, 1919. An unusual feature was the housing of the exhibitors in a large tent divided into separate booths with a wide aisle in the center.

Robert I. Wishnick, formerly general manager of A. Daigger & Co., manufacturers, importers and exporters of chemicals, oils, and colors for the rubber trade, has been elected vice-president of the company.

Louis Birkenstein, of S. Birkenstein & Sons, Chicago, Illinois, rubber scrap dealers, has resigned his position as chief of the Surplus Property Division, office of the Director of Storage, his resignation becoming effective September 1, 1919.

Richard Blickenderfer, formerly with the Thermoid Rubber Co., Trenton, New Jersey, has been appointed manager of sales for the Dural Rubber Corp., Flemington, New Jersey, at Philadelphia, Pennsylvania.

H. G. Vanderhoef has been promoted to the position of general sales manager of the hard rubber and electric storage battery-jar department of The Brunswick-Balke-Collender Co., Chicago, Illinois.

Sam J. Turnes, until recently advertising manager of The Brunswick-Balke-Collender Co., Chicago, Illinois, has been promoted to the position of general sales manager of the tire department, succeeding John W. Maguire, resigned.

William J. McDavid, until recently associated with the Russian American India Rubber Co., the Treügolnik of Petrograd, has opened an office at 111 Broadway, New York City, and been appointed correspondent of L. Sutro & Co., London, England.

Dan McAvoy has been appointed manager of the Omaha, Nebraska, branch of the Pennsylvania Rubber Co., Jeannette, Pennsylvania. He has been acting as traveling representative of the company in Nebraska and Iowa.

Alfred Varian, Jr., formerly with Charles F. Garriques Co., is now connected with the C. B. Peters Co., 15 Maiden Lane, New York City, and will continue to handle wood pulp for the trade.

A. E. Gordon has been promoted from the position of superintendent to that of general manager of the Beacon Tire Co., Beacon, New York.

George L. Sullivan, for three years advertising manager of The Fisk Rubber Co. of New York, Chicopee Falls, Massachusetts, has resigned to associate himself with the J. Walter Thompson Co., advertising agency, New York City.

Robert Duncan, of Duncan & Fraser, Limited, Adelaide, South Australia, is in the United States on business.

CANADIAN NOTES.

The Stanyon Rubber Co., Limited, is now located at New Toronto, Ontario, the factory being at 27 Brock avenue and the office at 25 Manning Arcade. The company manufactures dipped rubber goods, featuring toy balloons and nipples. The factory is of fireproof concrete construction, two stories high, with 30,000 square feet of floor space. The officers of the company are: Henry Stanyon, president; Charles H. Stanyon, vice-president; and Leonard L. Stanyon, secretary-treasurer.

The I. T. S. Rubber Co. of Canada, Limited, has recently removed from 28 Temperance street to 22-26 Mulock avenue, Toronto, Ontario.

George L. McCrae has been appointed manager of the sole and heel department of the Goodyear Tire & Rubber Co., Limited, Toronto, Ontario. He will be assisted by C. R. Harshman. Mr. McCrae has been with the company eight years, and will continue to manage the mechanical rubber goods department.

Ames-Holden-McCready, Limited, Montreal, Quebec, of which T. H. Rieder is president, has opened branches in Halifax, Quebec City, Ottawa and London, Ontario, and Calgary, and are planning to open branches in Regina and Saskatoon. Rubber footwear as well as leather will be carried.

In the big plant of The Goodyear Tire & Rubber Co., at Akron, Ohio, 23,000 workers are employed. The factory continues in operation twenty-four hours each day, in three shifts of eight hours each.

THE RUBBER TRADE IN MASSACHUSETTS.

By Our Regular Correspondent.

Boston has been passing through a critical experience the past month, when the city police went on a strike, leaving the city unguarded, and many of its stores were looted by hoodlums, while criminals flocked here from other cities to take advantage of the lack of police protection. The state guard and the local militia were called out to police the city, thus drawing many men from business for such duty. Many, perhaps all the rubber factories, had employes who were thus called from their work and it is a credit to the industry generally that every man thus called to service has been paid his full wage during his absence from work, or the difference between his compensation regularly received and that paid by the state. The United States Rubber Co., which has thirteen factories in Massachusetts, took this view of the situation, as did the other manufacturers having fewer or less important establishments.

* * *

H. P. Ballard, secretary of the Boston Rubber Shoe Co., Malden, is the colonel of the Twelfth Regiment of the State Guard, and is on active duty in that capacity at present, with headquarters at the armory at Cambridge. Among his captains is E. H. Kidder, Boston branch manager of the United States Tire Co.

* * *

Stowe & Woodward Co., Newton Upper Falls, Massachusetts, has nearly completed a three-story extension to its main building, and is equipping it with the latest approved machinery for the manufacture of rubber-covered rolls of the largest dimensions. For some years this concern has made smaller rolls, such as are used in tanneries, bleacheries and dye works. But with the purpose of extending this department the new addition has been built, and the roll department has been placed in charge of Raleigh C. Adams, who was for 25 years with the Boston Belting Co., and for much of that time superintendent of the roll department. The equipment is adequate for covering paper-mill rolls of the largest dimensions, even up to those 250 inches in length, thus enabling the factory to meet the utmost requirements of the paper-making trade.

* * *

The New England branch of the Acme Rubber Manufacturing Co., Trenton, New Jersey, which has been located on Devonshire street near Summer street, Boston, for nearly a score of years, has been moved to 134 Summer street, where it occupies the entire second floor, thus giving a very commodious stock room where a line of "Red Letter" tires and tubes, a large variety of hose, and a good line of molded goods are carried. F. H. Albee, the New England manager, has been connected with this branch ever since it was started. He has a large acquaintance with the trade, and reports a marked increase in the business since his removal to the new location.

* * *

The Boston Belting Co. is pushing ahead with a very considerable domestic trade, and an export demand which is on the increase. At present the company is at work on a contract for several large conveyor belts, one of which is 42 inches wide and nearly 800 feet long. There is also a good demand in the hose department, including a large amount of oil suction hose for one of the large oil-producing companies. The export demand mentioned is mainly for hose, the company's brands having made a reputation for standard goods in several foreign countries.

* * *

J. C. Haartz, Inc., 10 High street, Boston, has equipped a rubber mill at New Haven, Connecticut, for the manufacture of calendered goods including materials for automobile manufacturers and spreader coated fabrics. "Paramount" auto top materials and "Haartz mackintosh cloth" will be featured. The Forsyth Dyeing Co. is a department of this concern, which effects close cooperation between dye-house and rubber mill. The company is capitalized for $1,000,000 common and $500,000 preferred stock. The officers are: J. C. Haartz, president and treasurer; D. B. Stevens, vice-president; and Thomas Forsyth, assistant treasurer and general manager at New Haven. The above, together with Leslie Forsyth and L. A. Pickard, constitute the board of directors. The rubber mill is under the management of I. Frank Burnham, formerly superintendent of the Stoughton Rubber Co. Division of the United States Rubber Co., Stoughton, Massachusetts.

* * *

J. Frank Dunbar Co., Inc., importer and dealer in crude rubber, for a number of years at 201 Devonshire street, Boston, removes October 1 to 166 Essex street, Room 51. This is in a most convenient location, but a short distance from the South Terminal Station, and adjoining the commodious headquarters of the New England Shoe and Leather Association and the Boston Boot and Shoe Club.

* * *

The Tyer Rubber Co., Andover, Massachusetts, has added a line of standard cord tires to its regular output.

At the recent Welcome Home Celebration in honor of the Andover soldiers returned from the war, the Tyer company participated in the parade with four trucks arranged as floats, of which two represented "The Sinking *Lusitania*" and "The Peace Table," bearing the slogans, respectively, "This started it" and "This finished it."

* * *

The C. & C. Rubber Co., Stoughton, Massachusetts, has discontinued its Boston office, and is concentrating its entire business at its Stoughton plant. A new building is in process of erection which will add about 7,000 square feet of floor space. The company manufactures raincoats, and has just added a new line of industry, the manufacture of blankets, having purchased a number of automatic looms from the American Felt Co., which has discontinued, and is dismantling its Hyde Park Mills department. The C. & C. Rubber Co. will start with an equipment of six looms, to be increased later as the new industry develops.

* * *

The Hood Rubber Co. is building a four-story brick structure at its plant at East Watertown, which, when completed, will enable the company to rearrange some details of the manufacture to expedite its business.

* * *

Colonel Harry E. Converse, president of the Boston Rubber Shoe Co., who has been in somewhat poor health the past six months, is now in the West recuperating, and reports are to the effect that he is steadily and rapidly improving.

* * *

At a recent meeting of the directors of the First National Bank of Boston C. Sinclair Weeks and A. Stanley North were elected assistant cashiers.

* * *

Miss M. G. Webber, for the last three years in charge of the outdoor advertising of The Fisk Rubber Co. of New York, Chicopee Falls, Massachusetts, has been promoted to the position of advertising manager of the company.

THE RUBBER TRADE IN NEW JERSEY.

By Our Regular Correspondent.

Trenton rubber manufacturers report that business is good at the present time and that fall and winter prospects are excellent. The outlook for tires and tubes is very good while the other branches of the industry are also picking up following the summer months. The Ajax Rubber Co. has placed a number of new hands at work because of the increase in trade, and the United & Globe Rubber Co. is busy in all its departments at the present time.

The Thermoid Rubber Co., Trenton, has engaged the Osborn Engineering Co., Cleveland, Ohio, to prepare plans for a three-story building, 100x275 feet, of reinforced concrete brick and steel.

* * *

The United States Rubber Co. recently unveiled a large bronze tablet at its plant at New Brunswick, New Jersey, in honor of the thirteen men who entered the war from that factory, and in honor of Chester Brokaw, who made the supreme sacrifice. Deshler Wilmot, factory superintendent, was in charge of the services. Miss Hattie Brokaw, sister of Chester Brokaw, unveiled the tablet, which bears the following inscription: "In honor of the employes of the United States Rubber Company, Jersey factory, who at the call of their country, laid aside their vocations and entered the service to fight in the great war for world wide liberty, 1917-1919."

* * *

The Stanwood Rubber Co. is installing new machinery in its plant at Elizabeth, New Jersey, under the direction of Edward Hutchens, vice-president and engineer. A 175-foot stack is being erected for the 1,000-kilowatt power plant.

* * *

The pumping plant at the works of the India Rubber Co., New Brunswick, New Jersey, was partially destroyed by fire recently.

THE RUBBER TRADE IN OHIO.

By Our Regular Correspondent.

Little interest is shown here in resumption of trade with Germany, or in foreign trade as a whole. Domestic business is so good and the demand for tires so great that there is little time to think of the resumption of trade with Europe.

At the Firestone, Miller, Goodrich and Goodyear offices it is stated that the financial and credit situation in Germany is the greatest drawback not only to the rubber but to all trades, and that the lack of shipping facilities is another factor which renders commercial exchanges with Europe almost impossible. France, England and Italy, it is asserted, are making deliberate efforts to keep out American trade in order to foster their own industries, while Holland and Sweden are very anxious to get American rubber goods. The credit situation in both of these countries, however, is also unfavorable.

Local factories are looking to the Orient as the great coming market for manufactured goods. China and Japan are beginning to purchase rubber products in large amounts, and in a few years it is believed that the business with these countries will have risen to a high level.

AKRON NOTES.

All the Akron rubber companies have agreed to cooperate with the municipal university in a plan whereby employes will be able to work part of their time and spend the remainder in school. One of the plans sanctioned is that two men may hold one job, each working half of the regular shift.

* * *

Several companies have placed $6,000,000 in the hands of their directors to solve the housing problem which is the chief cause of the inability of the rubber factories in Akron to meet the demand for tires.

The Home Owners Investment Co., embracing all the big rubber manufacturers and other Akron business men, are accepting applications from prospective home owners if the prospects have 10 per cent of the total cost of the home they wish to build, and to date approximately 200 houses have been started by those whose applications have been accepted.

The Coventry Land and Improvement Co., a concern which has been sponsored by H. S. Firestone, has taken out building permits for 62 additional homes to be built in Firestone park, making a total of 450 houses which the company will have built and sold within the past year.

The sales of the Firestone Tire & Rubber Co. from November 1, 1918 to September 1, 1919, amounted to $69,475,197.14, which was an increase of more than $3,000,000 over the same period of last year. August was the biggest month the company ever had, business being $2,456,994.30 more than for August, 1918. The company will build a new $400,000 factory in the rear of Plant No. 2 for the manufacture of tires.

The Firestone Tire & Rubber Co. is helping to reduce the high cost of living for their employes by opening a cooperative store in the Firestone Club House. The store is being operated on a cost plus ten per cent basis and is well patronized.

* * *

W. W. Wildman has resigned as president and general manager of The Portage Rubber Co., Akron, but will retain his position as a director and his interest in the company.

* * *

John W. Maguire.

John W. Maguire, president of the Mid-West Rubber Manufacturers' Association, has been elected vice-president and general manager of The Portage Rubber Co., at Akron, Ohio, to fill the position of W. W. Wildman, who recently resigned. Mr. Maguire will have full charge of the company's affairs and will immediately inaugurate an energetic campaign for increased business.

Mr. Maguire has been identified with the rubber industry for over twenty years. He was formerly general manager of the rubber sales department of the Brunswick-Balke-Collender Co., having joined the organization when the rubber tire department was added to the company's activities about four years ago. Previous to this time Mr. Maguire was associated with the Republic Rubber Co., for 10 years.

* * *

Reports from The Goodyear Tire & Rubber Co. indicate that the industrial democracy which was inaugurated in August is working even better than was expected by the employers.

The conduct of the company with regard to matters of policy as well as the settlement of all difficulties between the management and the men, is in the hands of two legislative houses made up along the lines of the national House of Representatives and the Senate. The whole factory has been divided into districts and wards, and the men vote for their representatives by the secret ballot system. In the House there are 80 representatives and in the Senate there are 40. P. W. Litchfield, factory manager, sponsored the system's adoption.

F. A. Seiberling, president of The Goodyear Tire & Rubber Co., upon his return from the West, stated that the plant being built by the company in Los Angeles is not to be taken as an indication that the company expects to cease growing in Akron.

The new plant is intended primarily to take care of the ever-increasing western trade. The cost of bringing crude rubber from San Francisco to Akron and then hauling the tires back over the same route can be materially reduced by building a plant on the Coast where the crude rubber of the Orient and the cotton of plantations in the Southwest can be brought together.

Mr. Seiberling stated that as soon as housing conditions made it possible the company will employ 10,000 more men in order to operate the Akron plant at 100 per cent instead of 70 per cent as at present.

George Hockensmith, well known in the aeronautic field, and formerly overseer of the Goodyear experimental station in Ak-

ron is reported as being the head of a $1,000,000 trans-Pacific navigation company which is being organized in Los Angeles.

* * *

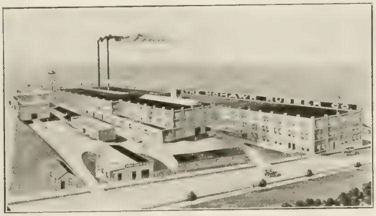
John F. Rae, for two years a member of the Bureau of Municipal Research in Akron, is the latest man drafted by the Goodyear Tire & Rubber Co. for an executive position. He is well known in New York, and recently assisted in a survey of the state institutions of Virginia.

* * *

A new aviation school has been opened in Akron with John F. Aston as general manager. The purpose of the school is to train air pilots and also to make photographs and carry passengers. Lieut. H. C. Miller is chief pilot.

* * *

The Mohawk Rubber Co., Akron, Ohio, organized six years ago, has found it necessary to construct a substantial addition to its factory, because of the heavy demand for its tires, and especially its cord tires, which are a comparatively recent addition to its line of manufacture. The accompanying illustration shows the factory as it is to-day, including the new building recently completed.



Plant of the Mohawk Rubber Co.

MISCELLANEOUS OHIO NOTES.

Buildings for several new rubber factories are being erected in the vicinity of Akron. The Arnold Rubber Co., with a capitalization of $50,000, is constructing a new building in Ravenna. Rubber heels are to be the principal product and about 50 persons will be employed.

* * *

The Cascade Tire & Rubber Co. is breaking ground for its plant at Ravenna, Ohio. The capitalization of this company is $1,000,000, and approximately 300 men will be employed when operations are begun. Tires will be the principal product.

* * *

The Mason Tire & Rubber Co., Kent, Ohio, reports progress in the erection of its new buildings which it expects to occupy by January 1, 1920. The additions comprise about 125,000 square feet of floor space and include a three-story heater room addition which will house six additional vulcanizers; a three-story calender building; a three-story tire building; a complete two-story solid tire manufacturing plant comprising an entire wing, having its own mills, tubing machines, and vulcanizers; and a new garage to house company and employes' cars. At the same time the present cafeteria will be enlarged to three times its present size to acommodate the prospective additional employes of The Mason Tire & Rubber Co. and of The Mason Cotton Fabric Co. The office building is also being trebled. All the additions will be of reinforced concrete steel construction with brick facing.

* * *

The Anchor Rubber Co., Barberton, Ohio, which recently suffered the loss by fire of its leased plant at Columbus, has purchased ground in Barberton and is erecting a two-story building, 45 by 100 feet, to cost $25,000. The company will manufacture druggists' sundries, mechanical rubber goods, and advertising and toy balloons.

* * *

The Pharis Tire and Rubber Co., Newark, Ohio, has purchased five acres of canal property from the state and is now planning an addition for the increased production of fabric tires and the manufacture of cord tires. The new structure will be three stories high, 100 by 145 feet, with complete boiler house and steam plant. It is hoped that the new building will be ready for occupancy before winter.

* * *

The Pelletier Rubber Co., Cincinnati, Ohio, manufactures a tire interliner which it calls the "Lyner Tyre."

* * *

The Wayne Tire and Rubber Co., Orrville, Ohio, has succeeded to the business of the Orrville Rubber Co., and has assumed all liabilities and acquired all assets. The management, however, will remain the same, the change being only in name and ownership. H. R. Platt is general manager.

* * *

The Owen Tire & Rubber Co., Bedford, Ohio, has increased its board of directors from five to seven, adding O. M. Dickison, secretary-treasurer of The Tuscora Rubber Co. E. M. Blatz was reelected director and vice-president. Mr. Blatz is president of The Tuscora Rubber Co., which is building a new plant between Dover and New Philadelphia, Ohio.

* * *

The Galion Rubber Co., Galion, Ohio, has bought the Flat Iron Building, formerly leased, and will build a two-story addition. J. N. Smeltzer is president and E. F. de la Croix, vice-president.

PRESIDENT OF THE MASTER TIRE AND RUBBER COMPANY.

William B. Ruston, president and general manager of the recently incorporated Master Tire & Rubber Co., Dayton, Ohio, is peculiarly well-fitted by ability and experience for the position, having been in the rubber business more than a score of years. He entered the employ of The B. F. Goodrich Co., Akron, Ohio, as errand boy in 1897, and his rise was steady and sure, for five years later he was transferred to the Philadelphia branch as assistant branch manager. After eight years there he resigned and tires manufactured by the Lee formed a company to market the Tire & Rubber Co., Conshocken, Pennsylvania.

William B. Ruston.

From this business he resigned to become associated with the Thermoid Rubber Co., Trenton, New Jersey, as salesman, covering five States, and working up a business which placed him at the head of the sales force of that company in the amount of goods sold. After occupying this position for five years he accepted the offer of the Dayton Rubber Manufacturing Co., Dayton, Ohio, to sell its goods in certain territory on a commission basis. So successful did he prove in this work that the company management called him to the home office to take entire charge of the sales department, and this position he resigned last April to take an active part in the formation of The Master Tire & Rubber Co., which will manufacture cord tires at Dayton, Ohio.

NEW McGRAW SALES MANAGER.

H. M. Bacon, the newly appointed sales manager of the McGraw Tire & Rubber Co., East Palestine and Cleveland, Ohio, is one of the most widely known executives in the automotive industry. As one of the pioneers, he became interested in the manufacture of motor cars in the early days, and for some time was identified with the industry in Detroit, Michigan. This gave him close touch with the tire and accessory field, and in 1911 he joined the Diamond Rubber Co., Akron, Ohio, three years later, assuming full charge of the sales of Diamond tires and accessories, a position which he held until August of the present year, resigning to accept the management of sales for the McGraw Tire & Rubber Co., with headquarters at Cleveland, Ohio. Previous to establishing himself there he is making a tour of all the McGraw agencies throughout the country to come into personal touch with the representatives and salesmen.


H. M. Bacon.

MID-WESTERN NOTES.

By Our Regular Correspondent

The Wilson Tire & Rubber Co., Springfield, Illinois, has recently completed a 100 by 200-foot addition to its factory building, in the form of a court to the old building, to be used as a vulcanizing shop. Two new vulcanizers and additional tire building equipment has been installed; the new addition and equipment representing an investment of about $60,000.

* * *

The Lincoln Highway Tire Co. has placed orders for considerable additional machinery and equipment to keep pace with the growing demand for the company's tires and tubes. The company contemplates the building and equipment of a new unit early in 1920.

* * *

The Great Republic Tire & Rubber Co., with the executive officers in Muskogee, Oklahoma, which recently began operation of their new factory at McAlester, Oklahoma, plans to increase its production to 150 tires and 250 tubes daily. A full line of accessories as well as rubber heels and soles will also be manufactured. W. H. Owens is vice-president and general manager, and C. W. O'Donnell is factory manager. Mr. O'Donnell has had many years of experience in the manufacture of high-grade tires and tubes, having been formerly connected with the Mohawk, Racine, Perfection and others.

* * *

At a meeting of the board of directors of the Standard Four Tire Co., Keokuk, Iowa, July 18, three vacancies were filled, making the new board of directors as follows: J. B. Gabeline, Burlington, Iowa; Henry Trout, Mt. Pleasant, Iowa; W. G. Feignspan, Quincy, Illinois; L. L. Birkett, West Liberty, Iowa; James Guthrie, Hamilton, Illinois; T. Thompson, Brighton, Iowa; E. P. Armknecht, Donnellson, Iowa; E. S. Anderson, Oskaloosa, Iowa; Lee T. Gobble, Fairfield, Iowa.

A new addition is being added to the present plant which when completed, will increase the capacity from 500 to 1,000 tires and tubes a day. By the first of the year, this company expects to have a cord tire on the market. The personnel of the new organization follows: President and general manager, J. B. Gabeline; vice-president, T. Thompson; secretary, C. O. Frazier; auditor and temporary treasurer, W. E. Vance; general sales manager, F. R. Eyer. Mr. Eyer was formerly western district manager of the Amazon Rubber Company of Akron, Ohio, and Mr. Frazier has been connected with the Standard Four Company ever since its organization.

* * *

The Archer Tire & Rubber Co., Minneapolis, Minnesota, is putting in a new battery of boilers which will double its power plant; also a converter for the calender and a new sixty-inch vulcanizing press. It has recently added a full line of equipment for all sizes of fabric casings and has increased its output in the past five months about 120 per cent. The production for the month of August will exceed 450 tires and 600 tubes a day. A year ago the production was 36 tires a day and no tubes.

* * *

The Ten Broeck Tyre Co., Louisville, Kentucky, has discontinued the manufacture of 2,500 mile guaranteed casings and will soon be in a position to fill orders on an 8,000-mile guaranteed semi-cord casing. The company has made some extensive improvements in its plant and the officials expect to direct their efforts towards the production of a casing that will give mileage far beyond the 8,000-mile guarantee.

* * *

Walter H. Grote, at one time connected with the United States Tire Co., The McGraw Tire & Rubber Co., and the National Tire & Rubber Co., is now factory superintendent and assistant general manager for the Archer company. Mr. Nicol, former general manager, has resigned and Robert J. Garrene, vice-president, has taken charge of the management of the company.

* * *

The Nebraska Tire & Rubber Co., Omaha, Nebraska, has recently completed its plant and is now prepared to produce 500 finished tires and tubes per day. The new factory building contains 35,000 square feet of floor space and has been equipped with new and modern machinery. The company owns one and one-half acres of land and its transportation facilities are excellent. The factory organization is headed by W. W. Wuchter, general manager, and J. W. Whighamas, chief chemist; both are experienced rubber men.

* * *

The Mason Tire & Rubber Co., Kent, Ohio, has appointed E. E. Gessert, manager of its branch office at 450 Jackson street, Milwaukee, Wisconsin, controlling the company's business in Wisconsin and northern Michigan.

* * *

The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio, has appointed Harry R. Brownless district manager of the Michigan territory, with headquarters at Detroit.

* * *

The Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, has reopened its office at 1003 City Trust Building, Indianapolis, Indiana, in charge of Knox Easterling. This office was closed during the war, but increasing business has now made it necessary to have headquarters in Indiana.

* * *

The Premier Tire & Rubber Co., Montgall and Nicholson avenues, Kansas City, Missouri, has purchased a building at that address, containing approximately 20,000 square feet of floor space, and sufficient ground for another building 85 by 200 feet, three stories high, for which it is soliciting bids. The officers of the company are: Grover Joce, president; F. W. Willis, vice-president; O. W. Dunham, secretary and treasurer. L. E. McKim, the chemical engineer and rubber expert, has been secured as general manager. He was formerly with the Republic Rubber Corp., Youngstown, Ohio. The company is making tires and tubes by a special method called McKimm's "Tensilene" process.

The Dural Rubber Co., Flemington, New Jersey, is now distributing its products through dealers in Denver and Salt Lake City. Edward R. Novak has recently been appointed the company's representative in charge of sales in the Central Western States. Floyd R. Biggs, formerly with The Fisk Rubber Co., Chicopee Falls, Massachusetts, is in charge of Western sales for the Dural company.

* * *

The Belden Manufacturing Co., 23d street and Western avenue, Chicago, Illinois, has let the contract for Building No. 8, four stories high, on West Van Buren street, to be 90 by 114 feet and contain approximately 10,000 square feet of floor space.

West Van Buren Street Plant of Belden Mfg. Co.

The structure will be of reinforced concrete, entirely fireproof, trimmed with red brick. Machines will be driven by individual motors as in the present factory, thus eliminating line shafts and belts.

* * *

The A. J. Stephens Rubber Co., 15th street and Chestnut avenue, Kansas City, Missouri, has increased its capital to $1,500,000 for the purpose of manufacturing tires and tubes as well as its tire accessories and fabric products. A. J. Stephens, founder of the business three years ago, becomes president and general manager of the enlarged corporation.

RACINE AUTO TIRE CONFERENCE.

More than 200 branch managers, salesmen and department managers of the Racine Auto Tire Co. attended the sales conference at Racine, Wisconsin, September 23-25, which was presided over by Clarence H. Wright, the secretary-treasurer and general manager of the company.

Clarence H. Wright.

This conference also marked the tenth anniversary of Mr. Wright's connection with the company, which in 1909 was manufacturing a leather-covered steel-studded tire. This tire was discontinued and through the efforts of Mr. Wright the "Horse-Shoe" tire was evolved and placed on the market. This year the company has added a cord tire to its line.

At the conference many plans were discussed for the further enlargement of the business. The Racine Country Club was taken over for the week of the conference, and golf, bowling and tennis were included in the schedule of entertainment.

ROSENWALD & WEIL SALESMEN VISIT KINZIE RUBBER PLANT.

The Kinzie Rubber & Manufacturing Co., Chicago, Ill., entertained the business heads and salesmen of Rosenwald & Weil, clothing manufacturers, that city, on August 28, on the occasion of the six-day sales convention of the latter mentioned concern. The party, to the number of 50 or 60, was conducted through the Kinzie factory, where the various processes were explained and the manufacture of rubberized fabrics and clothing demonstrated. At noon a substantial lunch was served and in the afternoon H. T. Kessler, general manager of the Keinzie Rubber & Manufacturing Co., gave a talk on "Rubber Goods and How They Are Made," and L. J. Ulber told "Why I Took Up the Selling of Kinzie Products."

The Friday session of the convention was devoted mainly to a golf tournament at the Harlem Golf Grounds, when trophies provided by Max Magnus, manager of sales of Rosenwald & Weil, were competed for.

PACIFIC COAST NOTES.

By Our Regular Correspondent

A. F. Osterloh, secretary of The Goodyear Tire & Rubber Co., has been elected vice-president and general manager of the new Goodyear company in Los Angeles, California. He started as a salesman in the Chicago territory four years after the organization of the Goodyear company and subsequently became branch manager and then manager of the western division of the sales department. He was brought to Akron as assistant secretary and in 1915 was made secretary.

A. F. Osterloh.

It is expected that a large number of men from the Akron factory will be taken to Los Angeles as soon as the plant there is ready for operation.

* * *

The Advance Rubber Co., Brooklyn, New York, has opened a branch at 721 South Olive street, Los Angeles, under the management of William J. Hartman, who has been with the company for a number of years, both in the factory and as a salesman.

* * *

The Dural Rubber Corp., Flemington, New Jersey, is now distributing its products through dealers in Los Angeles, San Francisco, Portland, Seattle, and Spokane. E. H. Wilson, president and general manager of the company, has just been visiting the Coast, where he found business particularly good.

* * *

The Huntington Rubber Co., Los Angeles, has taken the agency of the Miller Ad-On-a-Tire of the Miller Rubber Co., Akron, Ohio.

* * *

M. G. Haines, Pacific Coast representative of the Polack Tire & Rubber Co., recently paid a short visit to Los Angeles. During the war he was a lieutenant in the quartermaster's department.

* * *

The annual get-together business meeting of the Los Angeles, San Diego and Arizona branches of the United States Rubber Co. was held recently in the general offices of J. B. Magee, manager of the Southern California division. Plans were mapped out for the fall drive and the progress that has been made by the company in the Southern California territory was shown in the figures submitted by Mr. Magee. The thirty-five members of the conference lunched at the Los Angeles Athletic club and wound up at one of the beaches.

* * *

Elmer S. Firestone, Los Angeles representative of the Firestone Tire & Rubber Co., Akron, Ohio, has purchased a home

in Los Angeles. After completing the organization of the San Francisco branch, he was called east to organize the Buffalo, New York branch. After several years there he was transferred to Los Angeles and has been in charge here ever since.

* * *

Frank A. Vanderlip, recently elected director of the United States Rubber Co., and former president of the National City bank of New York, who has been in Los Angeles for two weeks, was given a rousing reception by the San Pedro Chamber of Commerce just previous to his departure. Mr. Vanderlip is the owner of the immense Palos Verde ranch, which adjoins San Pedro and spent a quiet vacation at his residence there during his sojourn in Los Angeles.

In his address Mr. Vanderlip pointed out that all Europe is upset and unable to recover her financial and industrial equilibrium, and that the unrest has spread to this country.

"The solution of our problem of unrest will probably be found," he said, "but it will not be found by the men who are resentful toward capital, and are inclined to do just enough work to 'get by' from day to day.

"The great idea all must consider is production. The wealth of the world lies in the day's work. Russia didn't think of production. She divided up whatever there was in sight, and now that it is all gone she is starving."

Mr. Vanderlip pointed out that this country occupies the happy position of having all raw materials save rubber, and of being able to sell all it can produce. The big thing during the next two years, he thinks, is cooperation, that all may be kept busy at reasonable wages, maintaining production at a high point, in order to supply other countries which are unable to produce what they need because of raw material shortage and lack of credits.

* * *

C. L. Smith, Los Angeles, has been appointed Southern California distributor of Dural red tubes. E. H. Wilson, president of the Dural Rubber Corp., was in Los Angeles recently and covered much of the local territory with Mr. Smith.

* * *

R. G. Henderson, representative of the Gates Rubber Co., Denver, Colorado, has completed arrangements with the Warfield Tire Service Co. for handling the Gates Half Sole Tires in Los Angeles. A model Gates plant has been set up at 938 South Main Street.

RUBBER TRADE INQUIRIES.

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

(739.) Request is made for addresses of manufacturers of woven fabric about 4¾ inches wide, selvage both edges, made with wire warp and cotton weft.

(740.) Inquiry is made for the addresses of concerns making tire-branding irons.

(741.) A reader asks for the addresses of concerns handling black hypo.

(742.) A subscriber requests information about "Rub-R-Glu," including address of manufacturer.

(743.) A foreign correspondent desires to represent United States manufacturers of organic accelerators in France.

(744.) A Japanese correspondent desires to secure the agency for the following rubber goods: Billiard cushions, printers' blankets, mattings, garden hose, and steam hose.

(745.) A subscriber inquires for the addresses of manufacturers of sheet zinc for use on cutting tables.

(746.) A request has been received for addresses of manufacturers of joint hammering machines.

(747.) A reader inquires where the following can be obtained: "Algin gum," "Ruberoid," "Cellit," and "Insullac."

(748.) An inquiry has been received for the addresses of makers of instruments for measuring hardness and resiliency of rubber.

(749.) A writer asks for compounds for dipped goods and the acid and vapor cure.

(750.) A manufacturer asks for the address of the makers of "Saxolin," a paper product which can be frictioned with rubber compound.

(751.) Inquiry is made for the address of the manufacturer of "Textilose," an unfrictioned paper product.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce or its district or cooperative offices. Requests for each should be on a separate sheet, and state number.

(30,474.) A manufacturing company in Greece desires to secure an agency for the sale of pneumatic tires. Correspondence may be in English.

(30,502.) A firm in Russia, which is opening a branch office for the distribution of supplies for hospitals, doctors and dentists, desires to purchase rubber articles for sanitary use. Correspondence may be in English.

(30,510.) The partner of a firm in France desires to be placed in communication with manufacturers of canvas who specialize principally in duck for pneumatic tires, with a view to selling this article to French manufacturers.

(50,519.) A merchant from Cyprus, who is in the United States for a short time, desires to secure an agency for the sale

(30,562.) A manufacturing chemist in Bohemia desires to of rubber goods in Cyprus and Syria.

purchase large quantities of rubber goods. Quotations, with samples, are requested.

(30,564.) An agency is desired by a merchant in France for the sale of canvas shoes with best quality of rubber soles. Quote c. i. f. French port. Correspondence in French.

(30,575.) A man who has been in the United States for several years now planning to go to England, desires to secure the agency for the sale of rubber overshoes.

(30,578.) A firm in Italy desires to purchase elastic webbing. Quote c. i. f. Italian port. Terms cash on receipt of goods. Correspondence in Italian.

(30,589.) A dealer in France desires to purchase or to handle on commission or consignment rubber tires.

(30,592.) An American export corporation is soon to send a representative to Europe and invites immediate offers from manufacturers of tires and rubber goods. Catalogs in duplicate and price lists, subject to confirmation, are requested.

(30,602.) A commercial agent in Czechoslovakia desires to secure agencies for the sale of solid tires.

(30,603.) A company of commission agents in France desires to secure agencies for the sale of rubber.

(30,625.) A commercial agent, representing a firm in Sweden, is in the United States and wishes to purchase rubber goods for hats.

(30,650.) An agency is desired by a man in Italy for the sale of pneumatic tires. Quotations should be given c. i. f. Italian port. Correspondence in Spanish.

(30,679.) A firm in Roumania desires to purchase rubber articles. Correspondence may be in English.

OIL FROM HEVEA SEEDS.

Hevea seeds contain 52 per cent of oil, from which a good quality of dark factice can be made, or with sulphur chloride it forms a white factice darker than that obtainable from colza and castor oils, and resembling that made from linseed oil. (A. Dubosc in "*Le Caoutchouc et la Gutta-Percha.*")

Activities of The Rubber Association of America.

DIVISIONS MEETINGS.

RECLAIMERS' DIVISION. The meeting referred to in the September issue as planned for Tuesday, September 9, was postponed indefinitely due to the inability to secure a quorum. A meeting will probably be arranged for early in October.

THE RUBBER CLOTHING DIVISION. The Rubber Clothing Manufacturers' Division and the Calendered Rubber Clothing Section of that division held meetings at the Yale Club on September 4, which were well attended and interesting because of the number of important subjects given attention and the spirit of constructive cooperation that marked the manner in which the subjects were handled.

THE TRAFFIC DEPARTMENT. On September 18 and 20 the Traffic Department held the largest meeting since its inception, both from the standpoint of the attendance and the number and importance of the subjects given attention. The Traffic Committee was in session two full days and, besides disposing of the large docket, was in conference with officials of the American Railway Express with a view to bringing about an alleviation of certain conditions now existing in connection with the transportation of rubber products by express, and it is believed that when the conclusions of the conference are put into practice the result will be beneficial to the trade.

MECHANICAL RUBBER GOODS DIVISION. On Friday, September 19, there was held a meeting of the Executive Committee of the Mechanical Rubber Goods Manufacturers' Division at the Yale Club followed by luncheon and a general meeting of the Division, which was unusually well attended. Plans were laid for the strengthening of the status of the Mechanical Goods Division in its relation to its membership and several specific subjects of interest to mechanical goods manufacturers in general were given attention. The Executive Committee voted to hold a regular monthly meeting on the third Tuesday of every month beginning with October, 1919, in line with the program for the increasing of the efficiency and importance of the work of the Division.

TIRE DIVISIONS. There was held a joint meeting of the Executive Committee of the Pneumatic and Solid Tire Manufacturers' Divisions September 23, which was full of interest by reason of its being the first meeting of the sort for several months and because of there having been received by the Association from tire manufacturers a number of subjects of importance involving trade principles and practices which were thought to need attention. A docket including more than a dozen subjects of broad interest was disposed of besides several other matters which were brought up during the course of the session.

RUBBER SUNDRIES. A call has been issued by the Association for a meeting of the Executive Committee of the Rubber Sundries Manufacturers' Division for the evening of October 7, at the Union League Club, New York City, and on the following day, October 8, at 1 p. m., a general meeting of the Division is to be held at the Yale Club.

TRADE INFORMATION SERVICE.

The Association has just concluded arrangements with a Washington Bureau for the furnishing of a daily trade information service which will place the Association in a position to inform its membership promptly of the development of matters of interest, and which will provide a more authoritative and prompt source of information on many important matters than has been available to the Association heretofore.

INDEX TO MANUFACTURERS IN THE RUBBER INDUSTRY.

The Rubber Association is preparing to reissue the "Index to the Manufacturers of the Products of the Rubber Industry," which was issued by the War Service Committee in May, 1918, in order to bring it up to date in respect to those changes in manufacturers' lines which may have followed the conclusion of the war, and to correct certain inaccuracies which found their way into the first issue.

WORLD'S COTTON CONFERENCE.

There is strong likelihood of arrangements being effected for the attendance of representatives of the rubber industry at the World Cotton Conference in New Orleans in October, which appears to be very desirable, when consideration is given to the relation of the rubber industry to the cotton industry, in the matter of consumption.

THROUGH EXPORT BILLS OF LADING.[1]

NEW YORK, August 26, 1919.

To the firm members of The Rubber Association of America, Inc.:

As you are probably aware, the United States Railroad Administration has resumed the acceptance of through export bills of lading via the North Atlantic Ports, when they are founded on written ocean contracts and only when shippers give written guarantee that any storage charges accruing at the seaboard will be paid.

Precedent to the acceptance of commercial freight in carloads for export, there must be presented by the shipper to the railroad agent at point of origin a "G. O. C. permit" issued by the traffic control manager at port of export on application from the agent of the steamship line booking the cargo, or from representatives of foreign governments or from the United States Food Administration.

The prepayment of ocean charges to the inland carrier is not considered desirable by the United States Railroad Administration, particularly on shipments handled on a measurements basis. Bearing on this matter the following instructions have been issued from the office of the Director, Division of Traffic, United States Railroad Administration, which are quoted for your information:

"Based upon conference with steamship lines interested in New York, August 13th, there is no objection to accepting prepayment of ocean charges in instances where shippers desire to prepay. There should be no complications in so far as ocean charges on weight cargoes are concerned. There will, however, doubtless be some discrepancies on measurement cargo, and in such instances I have said to steamship lines that we would collect from shippers any undercharges that might be reported back by the steamship lines, we remitting the undercharges to steamship lines as quickly as collection has been made of same from shippers."

A. L. VILES, General Manager.

RAILROAD MOVEMENT OF LOADED AND EMPTY COAL CARS.

NEW YORK, September 8, 1919.

To the firm members of the Rubber Association of America, Inc.:

Our attention has been directed to the statements of various coal operators that the United States Railroad Administration has failed to provide adequate service for the transportation of coal.

With the thought that this office may be in a position to render some assistance to members who are finding it difficult to obtain coal, because of transportation conditions, we would appreciate very much advices respecting any transportation delay affecting the coal supply of any of our members.

It is quite necessary that this information shall be so well founded that it will be comparatively easy to substantiate any statement made if called upon to do so.

May we not hope for your early attention to this matter?

A. L. VILES, General Manager.

FEDERAL EXCISE TAX—TREASURY DECISION PLACING BURDEN OF ACCOUNTING FOR TAX ON MANUFACTURER WHO PURCHASES TIRES, INNER TUBES, PARTS OR ACCESSORIES FROM THE MANUFACTURER THEREOF.

NEW YORK, September 6, 1919.

To the firm members of The Rubber Association of America, Inc.:

The attached important Treasury Decision has just been issued by the Treasury Department and reverses previous rulings to the effect that where tires, inner tubes, parts or accessories are sold by the manufacturer thereof to a manufacturer or producer of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories, and used by the latter other than "in the manufacture or production of new automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories, or for the sale of new automobile trucks, automobile wagons, other automobiles, tires, inner tubes, parts or accessories, or in connection therewith or with the sale thereof, or for free replacement under contract or guaranty," the purchasing manufacturer shall account to the manufacturer of the tires, inner tubes, parts or accessories also shall then account for and pay the tax thereon to the Government.

It will be noted that this decision provides for a revised form of certificate in lieu of the old so called manufacturer's certificate embodied in Treasury Decision 28[illegible], which was enclosed in circular letter of the Association, dated June 5, 1919. The Association believes that it will be unnecessary to obtain this revised form of certificate covering past transac-

[1] Under date of September 11, the Director of Traffic of the United States Railroad Administration advises that through export bills of lading should not be issued on traffic destined to Central America, South America, Africa, East Indies including Straits Settlements, Australia or New Zealand.

times where the old form has been procured, but, is, however, taking up this point with the Commissioner of Internal Revenue and will further advise you."

A. L. Viles, General Manager.

[2] A letter dated September 11, from the Association, states that the revised form of manufacturer's certificate embodied in Treasury Decision 2915 need not be obtained with reference to past sales. In other words, where the old form of such certificate, embodied in Treasury Decision 2852, has been obtained in the past, such old form of certificate is sufficient.

TREASURY DECISION 2915.

EXCISE TAX.

Scope of the provisions of Article 14 of Regulations 47, Treasury Decisions 2852, 2860 and 2893, relating to the sale of tires, inner tubes, parts or accessories, to manufacturers or producers of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts and accessories, for sale without further manufacture, modified.

Treasury Department,
Office of Commissioner of Internal Revenue,
Washington, D. C.

To Collectors of Internal Revenue and others concerned:

Article 14 of Regulations 47, entitled "Tires, inner tubes, parts and accessories sold to manufacturers," is hereby modified to read as follows:

Subdivision (3) of Section 900 of the Act exempts from tax, sales of tires, inner tubes, parts, or accessories to a manufacturer or producer of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories. In order for the sale to come within the exemption of the statute, the vendor must also at the time the goods are shipped or sold (whichever is prior) have in his possession an order or contract of sale, with certificate of the purchaser in writing, printed thereon or permanently attached thereto, to the effect that the purchaser is a manufacturer or producer of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories; that he is purchasing the articles in question as such manufacturer or producer for resale in some form or manner, or for free replacement under contract or guaranty; and that he will account to the Internal Revenue Collector and pay the tax on the sale of such articles, unless such sales by him are made to another manufacturer or producer of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories for resale by him in some form or manner or for free replacement, in which case he will require the same form of certificate from such manufacturer or producer; that when such tires, inner tubes, parts or accessories are sold other than on, or in connection with, the sale of new automobile trucks, wagons, automobiles or motorcycles, he will pay the tax on such sales (unless made to a manufacturer or producer, or for free replacement under a contract or guaranty); that when such articles are sold on or in connection with the sale of such new vehicles he will pay the tax on the selling price of such vehicles, including such articles. Said manufacturers furnishing such certificate will be deemed manufacturers within the meaning of the law and subject to the tax imposed on sales of such articles by manufacturers, unless the sales are made to another manufacturer or producer of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories, for resale by him in some form or manner or for free replacement under a contract or guaranty, and who furnishes a certificate so stating. Following is a form of the certificate or statement which will be accepted and in substance must be strictly adhered to.

FORM OF CERTIFICATE.[3]

The undersigned hereby certifies that he is a manufacturer or producer of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories, and that the tires, inner tubes, parts or accessories purchased hereunder are purchased by him as such a manufacturer or producer for resale in some form or manner, or for free replacement under contract or guaranty, and agrees if any of the tires, inner tubes, parts or accessories are sold by him except from tax to another manufacturer or producer of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories for like purpose, he will require a similar certificate from such manufacturer or producer. The undersigned further agrees that in respect to all tires, inner tubes, parts or accessories sold by him, unless such sale is made to such a manufacturer or producer, he will pay the tax on such sale direct to the Internal Revenue Collector, including it in his tax return covering the month in which such sale is made; said tax to be paid on the basis of the taxpayer's selling price of such articles when sold other than on, or in connection with, the sale of new automobile trucks, automobile wagons, other automobiles, motorcycles, tires, inner tubes, parts or accessories, and on the selling price of such vehicles or articles when the same includes such articles.

If it is impracticable to furnish a certificate for each order, a certificate covering all orders between given dates (such period not to exceed a month) will be accepted. If in any case such an order and certificate cannot be produced on demand of any authorized agent of the Department, the tax in respect to the sale will be considered in default.

So much of the provisions of Regulations 47, Treasury Decisions 2852, 2860 and 2893, as relates to the sale of "tires, inner tubes, parts or accessories" are, in so far as they conflict herewith, hereby revoked.

J. H. Callan, Acting Commissioner of Internal Revenue.

Approved September 3, 1919.
Carter Glass, Secretary of the Treasury.

[3] A letter dated September 13, from the Association, stated that the certificate outlined in Treasury Decision 2852 or 2915 will be accepted on sales between May 1 and August 31, 1919, but the certificate outlined in Treasury Decision 2915 must be used on sales on and after September 1.

NORTHWEST LAKE AND RAIL SHIPMENTS.

New York, September 12, 1919.

To the Members of The Rubber Association of America, Inc.:

As a matter of information and to supplement your Traffic Department files, we are enclosing herewith a copy of circular[4] issued by the Great Lakes Transit Corporation, setting forth the advantages of forwarding shipments to the Northwest via the rail and lake routes of that line as compared with the rates via all rail.

In this connection we also call your attention to the fact that rates via rail and lake also include insurance while the shipments are on board boats of the lake line. A. L. Viles, General Manager.

[4] Copies of this circular may be obtained from the Association.

THE FIFTH NATIONAL EXPOSITION OF CHEMICAL INDUSTRIES.

The Fifth National Exposition of Chemical Industries was opened in Chicago, September 22, at the Coliseum and the First Regiment armory, and continued during the week. It is the most comprehensive exhibition of chemical and allied products that has ever been shown, making plain to the general public the great advance made by American chemists during the war years, especially in those lines in which Germany previously was preeminent.

Holding the exposition in the Middle West has stimulated interest and resulted in several professional associations holding their annual meetings in Chicago, to enable them to examine the display. Among these are the American Institute of Mining and Metallurgical Engineers, the American Electro-Chemical Society, the Technical Association of the Pulp and Paper Industry and the American Ceramic Society.

Many of the exhibitors naturally are connected with the rubber industries. We may note among them:

The American Hard Rubber Co., New York City, with a display of hard rubber centrifugal and reciprocating pumps.

The Foamite Firefoam Co., New York City, apparatus for fire protection in oil and chemical plants, including the automatic sprinkler.

Werner & Pfleiderer Co., Saginaw, Michigan, rubber solution and cement mixers, rubber washers and mixing machines.

The Bristol Co., Waterbury, Connecticut, pressure gauges, measuring and electrical instruments.

The Buffalo Foundry & Machine Co., Buffalo, New York, vacuum dryers.

Daigger & Co., Chicago, Illinois, laboratory supplies and new chemical products.

J. P. Devine Co., Buffalo, New York, vacuum dryers, kettles, pumps.

General Electric Co., Schenectady, New York, a model of precipitation outfit, motor with acid resisting insulation, other innovations and improvements in electrical machinery.

The Hunter Dry Kiln Co., Indianapolis, Indiana, humidity dryer.

National Aniline & Chemical Co., New York City coal tar stuffs, intermediates and food colors. More than 200 distinct dyes of American manufacture.

New Jersey Zinc Co., New York City, zinc products and other chemicals.

Schaeffer & Budenberg, Brooklyn, New York, pressure gauges, other recording instruments and testing apparatus.

C. J. Tagliabue Manufacturing Co., Brooklyn, New York, controllers and recording machinery.

Taylor Instrument Co., Rochester, New York, temperature and humidity measuring instruments.

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, electric apparatus applied to chemical industry.

Boyer Oil Co., New York City, seeds and nuts with the oil expressed from them, cake and meal.

J. H. Day Co., Cincinnati, Ohio, mixing and grinding machines.

Innis, Speiden & Co., New York, chemicals.

Product Sales Co., Baltimore, Maryland, glue, cement, chemicals, sponges, asbestos.

Whitall Tatum Co., Philadelphia, Pennsylvania, chemical glassware and laboratory apparatus.

A simple method resorted to in Germany for rendering finished rubber stoppers serviceable consists in turning off the hardened external portion in a lathe and finishing the surface with sandpaper. The hardened surface of a boring through the stopper is similarly removed by a round file.

Hevea Confusa in Singapore.

A tree which has been determined as *Hevea confusa,* Hemsl., has been discovered in the Economic Garden of the Singapore Botanic Gardens and recently destroyed to prevent cross-pollination with seed-bearing *Hevea brasiliensis* trees nearby. I. H. Burkill gives a very complete botanical description of this species in "The Gardens' Bulletin, Straits Settlements," of July 4, 1919, accompanied by an excellent photograph.

The history of the tree was unrecorded, but its dark gray bark attracted attention; its foliage was seen to differ from that of *Hevea brasiliensis,* likewise its flower. The seeds were small, though not outside the extraordinarily wide limits in which *Hevea brasiliensis* varies. On tapping, the latex was found to be yellow, meager in amount, and to remain tacky, with little elasticity.

Dried flowering specimens sent to the Royal Botanic Gardens, Kew, were determined as *Hevea confusa,* Hemsl., by Sir David Prain. Samples of the rubber submitted to Dr. Frankland Dent, government analyst, Straits Settlements, and to B. J. Eaton, agricultural chemist in the Department of Agriculture, contained about 95 per cent of a substance chemically rubber, but lacking the physical properties required in commercial rubber, probably, Mr. Eaton suggests, a polymer of caoutchouc. Rather under two

Hevea Confusa, 1910, Trinidad Botanic Gardens.

per cent of resins was contained. The tree yielded so grudgingly that the samples were too small for a vulcanization test.

Burkill describes *Hevea confusa* as belonging to the section of the genus which has the male flower buds blunt rather than acute, as in *Hevea brasiliensis.* The female flowers are a little smaller and the male flowers considerably smaller than those of *Hevea brasiliensis,* but a still more striking difference is the pose of the male flowers. The panicles are narrower than those of

Hevea, Hybrid, Trinidad.

Hevea brasiliensis, as much because the angle at which the side axes take off is smaller, as because they are of lesser size. The weakest panicles are wholly male, as in *Hevea brasiliensis,* and the stronger carry more and more female flowers upon the lower side branches up to 5 or 6. The perianth lobes are ovate and blunt, and the cup extends to half their length; they and the cup are straw colored with a magenta line down the middle from the tip or near it to the very base inside. Outside they are covered with short hair. The top of the ovary is conspicuously blunt with sessile stigmas. The male flowers are blunter than those of *Hevea brasiliensis,* straw-colored, have fewer anthers, and by the bending of their pedicels they face more or less earthwards. Outside they are hairy. This bending of the pedicels gives a very good distinguishing mark which the herbarium student cannot note so well as the field student.

Hevea confusa originates from British Guiana. It differs as little from *Hevea pauciflora,* Muell. Arg., of the same region, that to unite the two on botanical eye characters is quite justified, and it is not surprising that with only the seeds as a guide Dr. P. J. Cramer suggested *Hevea pauciflora* as the species. *Hevea pauciflora* is known to produce hybrids of no apparent value with *Hevea brasiliensis,* and that the same is true of *Hevea confusa* is shown by the experience of planters in Trinidad.

During the winter of 1911-1912 the Editor of The India Rubber World visited a plantation owned by Boston rubber manufacturers, where many *confusa* hybrids were found among true *Hevea brasiliensis.* The source of the seed from which these trees grew was a fine thirty-year *Hevea brasiliensis* of undoubted purity, growing in the Botanic Gardens of Port of Spain. About one hundred feet from it was an equally large and thrifty *Hevea confusa.* The theory, therefore, is that bees visiting the flowers of *Hevea confusa* conveyed pollen to the flowers of the *Hevea brasiliensis,* and thus were responsible for the creation of a troublesome mongrel. That it was discovered while planting

was still young in the western world is most fortunate, and Mr. Burkill deserves a vote of thanks from all *Hevea* planters for being so keenly alive to the importance of keeping this species and its hybrids out of the plantations of the Middle and Far East.

As found in Trinidad, the *Hevea* hybrids were of lusty growth, full-branched and densely leaved. The leaves were much broader toward the point than those of *Hevea brasiliensis*, the leaves of hybrid seedlings standing out from the stem almost horizontally and those of *Hevea brasiliensis* hanging almost vertically. The bark was of dark reddish color rather than of the usual silvery appearance, and hardly more than an eighth of an inch in thickness. The surface of the outer bark was broken by many minute spines; whereas, the bark of *Hevea brasiliensis*, although nearly smooth, shows tiny vertical ridges. The latex produced a rubber that was very short and far inferior to fine Pará. After the latex had ceased flowing, a yellow-green resin oozed out and rolled down over the bark and there remained as sticky as the surface of fly-paper.

CAPTAIN BUCKLETON VISITS GERMAN RUBBER FACTORIES.

Captain Ernest E. Buckleton, president of the Northwestern Rubber Co., Limited, Liverpool, England, has recently returned from an extensive tour of the leading rubber factories of Germany. He was the first business man from an Allied country to visit Germany after the armistice was signed, and of course the first in the rubber industry. The trip was exceedingly interesting in that it gave him a good opportunity to learn from the heads of the largest concerns the condition of the German rubber industry during the war and at present.

Captain Ernest E. Buckleton.

Regarding his findings Captain Buckleton writes as follows:

I found that all of the factories were working at fullest capacity, the government favoring small factories which, up to the starting of the war, were in very low water, but in the past five years have improved their condition. In fact, all of them have made considerable money and relatively are in a very sound position.

During the period of the war, the manufacturers of Germany did not suffer to any great extent from want of fabrics, the government having absolute control of this material and apportioning it out to the industries where it was most needed. What they suffered from mostly was want of crude rubber and oils, as their stocks, when war was declared, were very low. Prohibitive prices, as high as $7.50 per pound were paid for crude rubber, when it could be found. A substitute made from coal and chalk was produced by the Elberfelde Co. and marketed as "synthetic rubber," the price of this material averaging about $3.60 per pound.

The use of reclaimed rubber during the war was considerably increased, and the product turned out was very good, the price, however, being very high.

The working conditions in the factories, from what I could learn, were about the same as in all other Allied countries in Europe during the war period, and the conditions today about the same. The average mill man earns about 55 to 60 cents per hour, but the output is only roughly three-quarters of normal.

The highest prices paid for various materials in Germany during the war period are as follows:

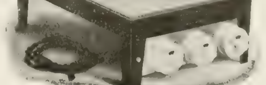
Article.	Date.	Price per Pound.
Aniline	February, 1915	[illegible]
Caustic soda	July, [illegible]	[illegible]
Ammonia solution	October, 1918	[illegible]
Caustic soda lye	June, [illegible]	.46
Caustic potash lye	December, 1918	[illegible]
Caustic potash, 90 per cent	June, [illegible]	[illegible]
White lead	March, 1917	[illegible]
Litharge	September, 1917	[illegible]
Natural pumice	May, 1916	[illegible]
Benzol	July, 1919	[illegible]
Cylinder oil	April, 1916	[illegible]
Chloride of sulphur	July, [illegible]	.43
Ceresin	July, 1917	[illegible]
Bleaching powder	June, 1919	[illegible]
Rosin	August, 1915	[illegible]
Resin	February, 1916	[illegible]
Calcium carbide	May, [illegible]	[illegible]
Brown factice, best	July, 1919	[illegible]
Brown factice, ordinary	March, 1919	[illegible]
Prime rape seed oil factice	April, 1917	[illegible]
Varnish substitute	[illegible]	1.47
Flake graphite	October, 1918	[illegible]
Gypsum	May, [illegible]	[illegible]
Graphite	April, [illegible]	[illegible]
Golden sulphuret of antimony	September, 1918	[illegible]
Golden sulphuret of antimony	July, 1915	[illegible]
Powdered glass	April, [illegible]	[illegible]
Rosin oil	May, [illegible]	[illegible]
Hydrate silica of alumina	November, [illegible]	[illegible]
Common chalk	March, [illegible]	[illegible]
Refined chalk	October, 1918	[illegible]
Lime	May, [illegible]	[illegible]
Linseed oil	August, 1915	[illegible]
Carbonate of magnesia, heavy calcined	November, 1915	[illegible]
Mineral rubber	February, 1918	1.03
Machine oil	April, [illegible]	2.29
Olive oil	April, 1919	2.07
Soft soap	[illegible]	[illegible]
Olein soap	March, 1916	[illegible]
[illegible]	[illegible]	[illegible]
Carbon black (lamp black)	March, 1915	[illegible]
Muriatic acid	February, 1919	[illegible]
Rectified spirit	July, 1919	[illegible]
Soda	[illegible]	[illegible]
Sulphur	July, [illegible]	[illegible]
Carbon bisulphide	March, [illegible]	[illegible]
Barytes	February, 1919	[illegible]
Sulphuric acid	November, [illegible]	[illegible]
Zinc sulphide	November, [illegible]	[illegible]
Talc	March, 1917	[illegible]
Turbine oil	May, [illegible]	[illegible]
Carbon tetrachloride	May, [illegible]	[illegible]
Zinc oxide	June, 1919	2.86
Cinnabar	July, 1915	8.18
Zinc dust	February, 1918	1.36

EXPORT CONCERN TO DEVELOP SOUTH AMERICAN TRADE.

The Namusa South American Co., with temporary offices at 30 Church street, New York City, has been organized by a group of manufacturing concerns in the United States for the development and maintenance of export trade under the Webb-Pomerene Act. The plan under which the corporation will operate is sponsored by the National Association of Manufacturers.

ELECTRIC HOT-PLATE.

The Hoskins electric hot-plate for laboratory use has a heating element of the three-heat type made of chromel wire, producing 475, 600 and 750 degrees F. The heating unit is composed of three parallel windings of chromel wire which can be very easily renewed. It operates on 110 or 220 volts, alternating or direct current. (Hoskins Manufacturing Co., Detroit, Mich.)



Three-Heat Type Plate.

Holmes Brothers, makers of rubber machinery, have moved to 440 North Sacramento Boulevard, Chicago, Illinois.

The Rubber Trade in Great Britain.

By Our Regular Correspondent.

THE ECONOMIC PROBLEMS arising from the external debts contracted by all the countries recently at war—leaving America out of consideration—have come somewhat as a shock to those who had not anticipated anything of the sort. In the case of raw rubber the idea was that the European countries would send rush orders for large quantities and that the price would jump. The reality is that there is very little money anywhere to pay for imports and the arrangement made whereby long credits are allowed to the new states by the British Government is not considered an ideal one by the taxpayer who will have to shoulder any losses that accrue.

The fact that all import restrictions were removed on September 1 is not hailed with glee by manufacturers generally, despite the precautions which are to be taken to prevent the dumping of goods from a foreign land at a cost which is beneath the price at which they are sold in their own country. Those who wanted a tariff on all imported goods which are being made in this country are especially dissatisfied, though the consumer, of course, looks at things in a different light. At the time of writing it is too soon to say how the protection to be afforded to "key industries" will affect the rubber trade but it will not be a matter of great concern because, except in a few articles, we have always been an exporting rather than an importing nation in rubber goods. With regard to the profiteering bill, we may expect to see some reduced prices in the retail shops, especially in country districts and at the seaside where a good deal of profiteering has been going on in rubber goods.

A prominent proofing firm tells me that as regards its production probably the annual import of goods does not exceed $1,000, so there is nothing to fear from foreign competition. On the subject generally he expressed himself as in favor of competition as being conducive to progress. Makers of sand shoes and gymnastic shoes who have had in the past a good deal of competition from America and Germany, are wondering what Germany will do in the way of exporting on the removal of restrictions. Their goods were cheaper than ours, but not better, while as regards goloshes, it is reluctantly recognized that we are still in the position of having to meet a better article, if public preference is a safe guide.

NAPHTHA STORAGE.

Developments of some interest are now taking place in regard to this matter, which is closely connected with the storage of petrol and benzol in motor garages. In small rubber works it has been customary for the solvent naphtha to be drawn direct from the cask or drum as required, thus often leading to the inclusion of some water and sediment. In the larger works cast iron longitudinal tanks are used, capable of holding many thousands of gallons. These tanks have riveted covers and a sloping bottom where the water and sediment collect. A float attached to an index scale shows the volume of solvent in the tank at any time. The naphtha is either drawn off by a cock above the water line by hand or is pumped to the dough-mixing rooms. In this system there is a certain, though only small loss by evaporation and the tank contains an explosive mixture of air and vapor. At least this is what is generally stated, though I should have thought that the amount of vapor present would have been above the explosive limit. I have never heard of the explosion of a naphtha tank due to the ignition of this explosive atmosphere by lightning, though it is spoken of as possible. In the Bywater system of hydraulic storage the method adopted is to displace the liquid in storage by water, thus leaving no space for evaporation. No pumps are used, labor costs being thus reduced to a minimum as the water does all the work.

Briefly stated, the hydraulic system consists of a steel tank in which the liquid is stored. On delivery into the tank the liquid displaces a like quantity of water, which, being registered through a meter, measures the volume of solvent entering the tank. On the solvent being drawn off through another meter the water reenters the tank, to take its place. Plans have been worked out for utilizing the system in proofing factories, the naphtha being raised to the necessary level and run by piping to the several floors, a meter being fixed at each point of delivery, thus checking the exact amount taken by each machine. Although the hydraulic system has been adopted mainly for the storage of petrol for motor purposes, it has also been installed by two of our largest proofing works, the capacities being 10,000 gallons and 6,000 gallons. As the storage tank is usually sunk into the ground there is no tendency to float on swampy ground as it is always full of liquid.

Reverting to what I said about not having heard of the explosion of a naphtha storage tank, it may be of interest to say a word in regard to what appeared in the papers recently. This was to the effect that a certain casualty was due to the explosion of a naphtha tank at the rubber works of I. Frankenburg & Sons, Limited, of Greengate, Manchester. In reality this was not the explosion of a storage tank. The tank in question was a small service tank in one of the spreading rooms, the naphtha in which got alight from some unascertained cause, possibly the bursting of an electric light globe.

NEW WORKS.

Potter's Asbestos Co., Limited, Littleborough, Lancashire, is about to build a rubber works which will give employment to 1,000 hands. A housing scheme is to be put in hand by the local district council in order to provide for the influx of work people. Littleborough is only a few miles away from Rochdale, where the important asbestos plant of Turner Bros. is situated, and there is no regular rubber works in the district.

It is understood that Redfern's Rubber Works, Limited, Hyde, near Manchester, has decided to erect a new factory at Crewe, the well known railway center of the London & North Western Co.

The Standard Tyre and Rubber Manufacturers, Limited, has been formed with a capital of £125,000, to take over the rubber manufacturing business carried on at Alperton Mills, Wembley, near London.

The British Westinghouse Co., located in Trafford Park, Manchester, is to be known in the future as the Vickers Electrical Co., Limited. It was reported recently that Vickers, Limited, had obtained a controlling interest in Glovers Cable Works, situated only a few hundred yards from the Westinghouse works.

MAGNESIA.

In the course of one or two legal actions regarding the sale of magnesium carbonate, it was made evident by the varying statements of experts that there is still a good deal to be found out about the molecular constitution of the basic magnesium carbonate, so largely used in the rubber trade. Judging from the remarks of some chemists and their constant reference to the Pharmacopia, it seems that the large tonnage used in the rubber trade is not generally recognized and it is no doubt correct to say that no other industry uses it on a like scale. Outside purely legal questions as to the validity of contracts there has been a good deal of evidence given as to the difference between light and heavy carbonate of magnesia and also as to the presence of certain impurities, such as sulphate of soda. Despite the fact that analyses may show practically identical figures in the case of light and heavy, it requires very special pleading on the part of counsel to contend that they are the

same thing when the volumes occupied by the same weight of each are compared.

To the best of my knowledge rubber manufacturers who buy light carbonate of magnesia lay far more stress upon the lightness than upon any other attribute. Indeed, I doubt if any of them ever think about the degree of hydration or the linking of the hydroxyl groups. An eminent counsel declared that there must be some point at which light magnesia merges into heavy and that in the care of such a product it would be impossible to specify or identify it as light or heavy. Scientific evidence, however, has been given that light and heavy have different and distinct characteristics and that there is no such thing in commerce as a half and half product. It occurs to me here that there would be no difficulty in making up a mixture of the two if there was any demand for it and a dispute on a product of this sort would be a thorny matter to tackle.

With regard to the presence of sulphate of soda in magnesia made by the precipitation process, I do not know that there are any permissible limits recognized in the British rubber trade. This probably arises from the fact that attention has not been called to the point owing to the great bulk of the magnesia used in pre-war days being the product of a special process in which sulphates are not employed.

As to the use of the light and heavy in the rubber trade for bulk compounding, evidence goes to show that the light is almost generally employed whereas the heavy has but few adherents. Whether this preference is based on solid grounds is a matter which does not call for detailed discussion here. With respect to the use of small amounts as an accelerating agent I believe the general opinion is that the two work equally well.

It is interesting to note that a natural basic carbonate of magnesia having the same chemical composition as the manufactured article has been found in places in Canada and I believe that a consignment has been shipped to England.

Normal carbonate of magnesia, or magnesite, is, of course, comparatively common in the world and in the finely ground state it is said to be used to some extent in the rubber trade. As there is no recognized standard for light and heavy basic carbonate of magnesia, and as some makes of light are heavier than other makes of light, it certainly seems desirable that all contracts or rates should be by sample so as to obviate the possibility of disputes on delivery.

THE RUBBER TRUST'S HEAVY LOSS.

The report of the Rubber Plantations Investment Trust explains why the shareholders will have no dividend for the second year in succession, though it indicates that a better result may be expected for the present year. The balance at the end of March, 1918, was £119,375, the whole of which was carried forward. In 1918-1919 there was a net loss on the produce from the company's estates of £106,020, reducing the balance to 3,300, which naturally does not permit the payment of a dividend. The report contains the cheering assurance that the adverse war conditions have now been largely removed and that the intrinsic value of the trusts' investments, both in shares and properties, has largely appreciated—a valuation of the investments in shares, debentures, and options made at the end of last March, shows a surplus of £4,289,927 over the £815,647 at which they stand in the balance sheet. In 1910-11 the dividend paid was 15 per cent.

Miscellaneous Foreign Notes.

FEDERATION OF BRITISH INDUSTRIES INCLUDING RUBBER.

The Federation of British Industries comprises 172 associations and 956 individual firms, representing upward of 17,000 British manufacturing establishments. A plan of organization has been outlined under which the various industries are divided into 17 groups.

The rubber industry is placed under group 13, which consists of rubber, asbestos, leather and allied trades. The following list of sections in the group will make the system more clear:

Group 13. Rubber, asbestos, leather, and allied trades:
- Subgroup 1. Rubber Manufacture—
  - (a) General rubber trade.
  - (b) Tire trade.
  - (c) Proofing and garment making.
- 2. Leather production—
  - (a) Curriers and light leather manufacture.
  - (b) Tanning and heavy leather manufacture.
- 3. Leather-goods manufacture—
  - (a) Saddlery and harness.
  - (b) Boot and shoe manufacture.
  - (c) Leather belting.
  - (d) Bags and fancy goods.
  - (e) Balata belting.
- 4. Asbestos manufacture—
  - (a) Textiles, etc.
  - (b) Asbestos cement (building materials).

C. D. LLOYD RETIRES FROM THE VICTORIA RUBBER CO.

C. D. Lloyd, for 35 years with The Victoria Rubber Co., Limited, Edinburgh, Scotland, was presented with a gold watch and purse of Treasury notes from the staff and employes on August 14, 1919, when he retired. J. E. Baber, manager of the works, made the presentation speech in the absence of P. M. Matthew, managing director, commenting on the fact that a number of other members of the staff have been 30 years or more with the company, and emphasizing the spirit of cooperation in the past between the company and its employes as the ideal to be especially striven for in industry at the present time.

DISTINGUISHED SERVICE MEDAL FOR CAPTAIN ALCAN.

Captain Adrien Alcan, a partner in the firm of Alcan & Co., rubber merchants of Paris, France, associated with Hecht, Levis & Kahn, London, England, who for two years has been attached to American Army Headquarters in France, was recently awarded the Distinguished Service Medal by General Pershing in the name of the Government of the United States, with the following text:

> While on duty with the French Military Mission at General Headquarters, American Expeditionary Forces, he rendered services of exceptional value to the United States Army. His ability, tact, loyalty, and untiring efforts proved of inestimable assistance in the successful execution of many important negotiations with the French Army. He went far beyond the bounds of duty to help the American Expeditionary Forces, proving himself a willing and devoted friend to their interests.

SOCIETE INTERNATIONALE DE PLANTATIONS ET DE FINANCE.

The *Société Internationale de Plantations et de Finance,* a joint stock company with 25 million francs capital, aims to promote the plantation industry, especially the culture of rubber, olive trees, tea and coffee, in the various European Colonies in Asia, and the financing and administration of the plantations already in existence or those to be established.

Various well-known persons in financial and plantation circles in Belgium, The Netherlands, France, England and Switzerland are members of the board of directors. For the Netherlands they are the Messrs. J. F. van Tienhoven, K. P. van der Mandele, C. J. den Tex Bondt, O. F. Weise and A. G. N. Swart, the latter as a member of the Committee of Direction The main office is at Antwerp, Belgium, and a branch office will be opened at *'s-Gravenhage* (The Hague), Holland, while in Sumatra, Medan, the Federated Malay States agencies are being established.

A DANISH CABLE FACTORY.

Early in the war Denmark decided to make its own cables and the *A. S. Den Danske Kabelfabrik* was formed in the fall of 1916, exclusively with Danish capital. By the end of 1917 the buildings were ready at Fredericksholm Haven, Copenhagen, and work was begun in the wire-drawing mills. However, machinery ordered in America was held back, so Danish engineers were employed to exercise their ingenuity in constructing the necessary machinery, which is said to be satisfactory.

RUBBER IMPORTS AND EXPORTS.

Official statistics show Danish rubber imports and exports for the following years to be:

	Imports.			Exports.		
	1913.	1917.	1918.	1913.	1917.	1918.
Crude ......*pounds*	253,666	289,280	22,980	.....	.....	.....
Manufactured	2,227,720	1,107,920	135,080	168,960	.....	.....

AKRON TIRES IN AUSTRALIA.

Charles Duval, manager of tire sales for The B. F. Goodrich Co. in Australia, states that 65 per cent of the tires used on automobiles in that continent come from Akron factories, and believes that the market for American tires and rubber goods will materially increase in Australia in a few years. Motoring is much more expensive there than in America, gasoline averaging 85 cents per gallon and automobiles costing approximately twice as much as in the United States.

COOPERATION OF JAPANESE RUBBER COMPANIES.

A further development of Japan's increasing rubber trade is looked for through a combination of large and small rubber factories in and near Tokyo that is said to portend amalgamation at an early date so as to put the Japanese rubber manufacturing industry on a firm foundation. This was brought about by the receipt of large orders for rubber tubing and sheeting from the new Siberian Government that the Okuragumi has distributed among the Mitado, Toyo, Nippon and Meiji companies, regarded as having the best rubber works aside from foreign enterprises in Japan. This form of cooperation, involving the exchange of orders and stocks, has been decided upon to secure efficiency and economy, and to avoid unnecessary competition among local firms.

ANALYSIS OF ITALIAN RUBBER TRADE.

ITALY'S TRADE in rubber and rubber manufactures in 1913 amounted to $11,543,217 in imports and to $9,861,147 in exports. Of the former amount, imports of crude rubber accounted for $4,940,549 and of tires for $4,393,742. Tires were the largest item of exports, being valued at $7,927,379. The imports in 1917 were valued at $17,523,941, raw rubber accounting for $13,008,046, and tires for $2,130,257. Exports for that year were valued at $6,541,938, tires, the chief item, amounting to $4,829,323, and raw rubber to $299,787. In 1918 the value of the imports increased to $19,805,933—raw rubber being valued at $16,019,097, and tires at $1,050,885—and the exports decreased to $3,150,291—tires being valued at $2,090,248.

The Italian trade in rubber, gutta percha, and manufactures thereof is very small, the normal consumption within the country being about 2,000 tons per year outside of imported rubber overshoes. Practically all the raw material brought in is used by one company whose name is almost synonymous with rubber tires. Several other firms, however, manufacture rubber goods. Exports of tires have exceeded imports for some years, being, in 1913, 3,012 tons; in 1914, 4,114 tons; in 1915, 4,361 tons; in 1916, 3,778 tons; in 1917, 2,117 tons; and in 1918, 916 tons. Of the 1913 exports, which can be taken as representing normal conditions, 888 tons went to Belgium, 587 to Switzerland, 403 to Great Britain, 352 to Germany, 270 to Austria-Hungary, 134 to Argentina, 97 to France, and 64 tons to Australia. The largest customers for Italian rubber goods outside of tires, particularly for small tubes and elastic, were Argentina, Brazil, Cuba and Uruguay, which, with other Latin American countries, probably took two-thirds of all exports. Most owners of good automobiles prefer imported tires, which they consider superior to those of Italian manufacture. The market is not, however, extensive, as the number of cars is small.

The importation of rubber overshoes, which particularly interests American manufactures, who have had control of this market for many years, shows a decided tendency to decrease. Imports in 1908 amounted to 135,856 pairs; in 1909, to 159,168; in 1910, to 173,747; in 1911, to 201,824; in 1912, to 121,565; and in 1913, to 43,588 pairs. The present fashion of women wearing high-heeled slippers or low shoes for street wear in winter makes the use of rubber overshoes, except sandals, impracticable. Efforts should be made to encourage the trade in an overshoe designed for such wear.—("Commerce Reports.")

NEW PIRELLI MANAGERS.

Pirelli & Co., of Milan, Italy, announce that the following have been added to the personnel of the board of management, any two of whom together may sign for the firm: Federico Artom, Rizzieri Campiglio, Luigi Crosio, Dr. Mario Lubbatto and Guiseppe Venosta. These are in addition to Roberto Comelli, Carlo Fratino, Fabio Palandre and Lorenzo Ramelli, who were already on the board.

RUBBER GOODS REQUIRED BY ITALY.

Among the various goods required by Italian merchants who desire to sell on a commission basis are crude rubber, rubber shoes, rubber heels, fountain pens, etc.

American manufacturers who contemplate entering the Italian market should send samples either to a forwarding agent or to the American Chamber of Commerce in Milan. If notified where samples may be inspected, this consulate will gladly forward such information to interested parties in its district (Lombardy).

Other suggestions are: (1) Catalogs and correspondence should be in Italian or French. (2) When possible, price should be quoted c. i. f. Genoa, in Italian lire and metric measurements. (3) When quotations are f. o. b. American ports, there should be added the exact freight rate to Italian ports, in order that the prospective purchaser may know how much the goods will cost him delivered in Italy.

RUBBER EXPORTS FROM THE NETHERLANDS.

The *Vereeniging voor den Rubberhandel* (Society for the Rubber Trade) at Rotterdam, Holland, has forwarded a despatch to the Minister of Agriculture, Industry and Commerce, urging the removal of the export prohibition on crude rubber. Now that imports are free and there are no difficulties in obtaining crude rubber, it is in the interest of the plantation companies, and also for the restoration of the staple market, that rubber exports should be free.

AMERICAN VESSELS CARRYING CRUDE RUBBER TO THE EAST INDIES.

The interest now being manifested in the development of the trade between America and Java is shown by the fact that two large American cargo vessels recently sailed from Soerabaya on the same day, after discharging general cargo from America. One of these vessels is carrying direct to New York via the Suez Canal a full cargo, including crude rubber from Soerabaya, Samarang and Batavia.

A Rubber Letter from Germany.

From a Well-Known German Technologist

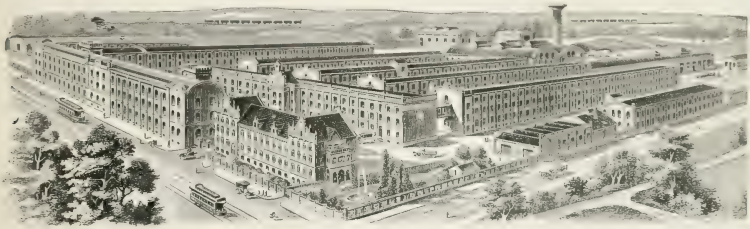
The war with its horrors is over, a new period of peace has begun. The campaign on the border came to an end as early as November, but the political and economic strife in the interior continues with undiminished energy even to-day. When will the real resurrection from the frightful cataclysm come about? Let us only hope that a dam may be built against the Bolshevist flood, that all-destroying terror which is far too greatly underestimated by you over there, but is far more dangerously menacing than you apparently think.

As a token of the difficult conditions with which the German rubber industry had to wrestle during the war the words "no crude rubber" will suffice. That tells the whole story. And while they succeeded during the period of the war in supplying the German textile factories with great quantities of domestic fibers for the most varied purposes, such substitutes were cut off from the rubber industry. Certainly we must not forget to mention that the preparation of artificial rubber was undertaken on a large scale during the war, and considerable quantities of this synthetic rubber were worked up by the rubber factories. It should be made clear in America that the veil which for a long time was wrapped about the creation of artificial rubber has been lifted. It is certain that the artificial rubber has done good service to Germany during the war years. Now it has again sunk out of sight, at any rate for the immediate future, since the German rubber goods factories are declining to take further quantities of synthetic rubber the moment sufficient quantities of the natural product are imported. As to what will become of the great works built to manufacture the artificial rubber, no light as yet has penetrated the darkness that covers the riddle.

I have before me a number of commercial reports of German rubber factories for the working year 1917-18. We find from these that the factories, in spite of the deficiency in crude rubber and the enormous difficulty of procuring other necessary raw material and stuff to work, were kept fully busy with the manufacture of the articles needed by the army administration and for economy purposes, and in general were not cut down seriously. It must be taken into consideration, however, that these figures show hardly or not at all the effects of the revolution in the last account. Following are the latest dividends paid by a series of standard enterprises:

	Dividends. Per Cent.
Continental Caoutchouc & Gutta Percha Co., Hanover	30
Mitteldeutsche Gummifabrik Luis Peters, Frankfurt am Main	14
Asbest und Gummiwerke Alfred Calmon, Hamburg	20
Hannoversche Aktien Gummiwarenfabrik	30
Mannheimer Gummi- Guttapercha und Asbestfabrik	11
C. Muller Gummiwaarenfabrik, Berlin	7½
Vereinigte Gothania Werke, Gotha	10
Norddeutsche Gummi- und Guttaperchawaarenfabrik, Berlin	15
Phil. Fenin Gummiwaarenfabrik, Leipzig	25
Gummiwerke Fulda	10
Vereinigte Berlin Frankfurter Gummiwaarenfabriken	15
Leipziger Gummiwaarenfabrik, vorm. Julius Marx, Heine & Co.	5
Gummiwerke Elbe, Hamburg	13

The prospects of the German rubber industry in the current business year are looked upon naturally with skepticism, for to-day there is lack not only of crude rubber, but also of oil and coal as well as other working materials. The loss of the world war and the upset it involves have hit hard the German rubber industry also, and no one can tell what is going to happen, for the factors on which the coming development depends are too many—the phantom of socializing business, continuous unrest, steady wages agitation and strikes, labor demands that cannot be granted, business expenses, payments and taxes that have risen enormously, the cessation of exports and the importation of manufactured goods from foreign lands, the inability to compete and the speculation in the markets of the world. All these things press down upon business measures and circumstances call for an entirely new internal and external organization.



Factory of the Hannoversche Gummi-Kamm Compagnie, A. G.

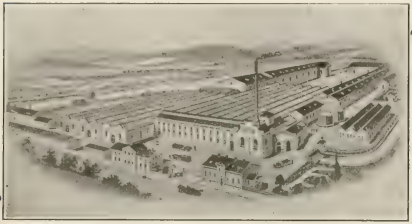
The Continental Rubber Co., Hanover, expresses the following opinion regarding the future: "We most seriously fear that we shall not be capable of competing in the world markets, and that even at home as soon as our boundaries are opened, we shall hardly be in a position to protect ourselves against foreign competition. However, it rests with us Germans ourselves how we lay out the future. We need quiet imperatively. If lasting peace returns to us, then we may well hope that raw materials will not be withheld and that with them labor will be provided for, because work, the hardest, most strenuous kind of work, is necessary if we are to recover and not go to destruction."

A few days ago the importation of crude rubber was permitted and thereby a "first pebble of resistance" was moved out of the way. The important question remains open, however. When shall we receive sufficient quantities to enable us to get manufactures into full swing? We know that there is a clear overproduction of plantation rubber, that therefore great supplies are to be had at low prices. How is it, however, with transportation to European markets? The war has brought about a complete change in the rubber market. We are, in the first place, still wholly dependent on London. And here we come to a point that interests in an unusually high degree the German circles that are concerned; it is the development of the American rubber and automobile industry, the investment of

American capital in East Asiatic rubber plantations and all that that implies. What America has accomplished in this line is really astounding, and the manner in which she has managed to utilize the war conditions that were favorable for this. Germany may, perhaps, be the chief sufferer, but the fact remains that it admires what America has been able to accomplish.

We have lost our colonies, can no more raise our own rubber; our manufacturers have neglected to invest large amounts of capital in the East Asian rubber plantation form of agriculture, and our Hamburg crude rubber market, erected only a little while before the war, is ruined.

As to the future of our market in Hamburg, that is obscure. May the words of M. A. Ritter receive the attention which



Vereinigte Berlin-Frankfurter Gummiwaren Fabriken (Gelnhausen Works).

they deserve from the circles that are interested. Ritter offers an answer to the question—how and in what way it may be possible to create soon in Hamburg an adequate rubber market that shall be in keeping with the importance of our rubber manufacturing industry.

He comes to the conclusion that the erection and maintenance of an independent plantation rubber market of the first rank in Hamburg, with all the great advantages it offers, can very well be carried out if a strict organization is established and the necessary measures are taken, that were essential in the creation of the foreign competitive markets (especially in London). Among the requisite measures and arrangements of which the aforesaid treats, the following may be mentioned briefly:

1. Equalization of freight charges for plantation rubber from the Eastern ports direct to Hamburg (a measure to be taken later).
2. Storage in the rubber associations' storage warehouses; uniform certificates of weight and storage receipts; uniform and regulated furnishing of samples, etc.
3. Requisition of uniform contract rules which shall at all times be fair to the interests of importers, brokers and dealers.
4. No private book sales, but public sales of definite, incoming, consigned lots, outside of free traffic.
5. Development of the rubber futures market.
6. Appointment of a committee of experts, which shall undertake the prompt and technical settlement of all differences of opinion.
7. Promotion of direct trade between the rubber plantation districts and Hamburg through the activity of German rubber traders and the financing of crude products exportation to Hamburg by German banking institutions, especially in Dutch India.

Ritter wishes through his appeal to call the attention of the persons concerned to this matter, of unusual importance for German economic life, by showing that it must be our endeavor to attain what the United States has already won during the war, namely, independence of middlemen and elimination of the circuitous way through London.

We can only wish that the sensible and certainly feasible ideas of Mr. Ritter may fall on fruitful soil and may also be sufficiently understood by the commercial class in Hamburg itself. It seems as though the pleas had really aroused interest here. The Hamburg crude rubber dealers are fighting energetically against the contemplated establishment by the Imperial Ministry of Commerce of a rubber and asbestos industry trust. They declare that the inclusion of the rubber trade in the rubber and asbestos trust and the establishment of a foreign trade office is wholly impractical for rubber importation and is uneconomical since the supply and the trading would be subject to the costs of this organization and consequently the price of raw materials would be needlessly increased for the German consumer. Importation into free ports, intermediate trading with foreign lands, and dealings in the goods lying in free ports must be kept free from any centralizing regulation; otherwise, the business of the Hamburg market, including the business in futures, would be driven to the competitive markets like Rotterdam, Antwerp, Liverpool, London, etc.

The old order is destroyed, the new must stand on firm foundations. When will all the clouds which surround the future of the German rubber industry be driven away?

GERMANY'S RUBBER REQUIREMENTS.

Among the raw materials which Germany desires the allied and associated governments to furnish, and regarding which inquiry as to quality, quantity and price has been made of the Committee on Minutes of Reparation Commission in Paris, is a monthly supply of 2,500 tons of raw rubber. This indicates a contemplated annual consumption of 30,000 tons, or nearly double what it was before the war.

SWEDEN CONTINUES RESTRICTION OF RUBBER EXPORTS.

Sweden still forbids the exportation, except when properly licensed, of: rubber, gutta percha, balata, reclaimed rubber, rubber thread; solid rubber tires, even if in lengths; inner tubes and outer covers and parts thereof, even when in combination with other materials for cycles and motor cars; rubber boots and shoes and rubber waste and scrap. Likewise: cycles and motorcycles with rubber tires fitted; carriages, vehicles and frames, without motors but with rubber tires; carriages, vehicles and frames, including airplanes and airships, with motors and the wheels with rubber tires for such carriages. Cycles, motorcycles, motor cars, airplanes and airships, however, may be exported if they had been imported into Sweden for the owner's own use, while travelers leaving the country may take such vehicles with them, provided they agree to reimport them into Sweden.

ENGINEERING CONGRESS AND INDUSTRIAL EXHIBITION IN JAVA.

A congress to which engineers from all countries touching the Pacific are invited, will be held at Weltevreden, near Batavia, Java, May 8 to 15, 1920, under the patronage of the Governor-General, at which over 170 papers on engineering problems in Asiatic countries will be presented. Among them will be several discussing the production of rubber.

Following the congress an industrial exhibition will be held at Bandoeng, which, while primarily intended to stimulate domestic industries, will give manufacturers of tools, machinery, bicycles and motorcycles, an opportunity to exploit their products. American houses must be represented by a Java firm in order to exhibit. A list of machinery houses in Java will be available for those who are interested.

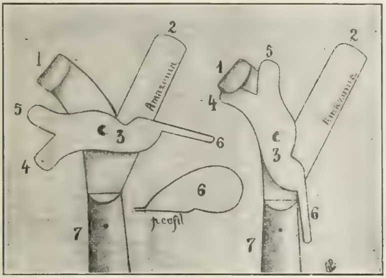
Further information can be obtained by addressing B. J. Krol, secretary of the Netherlands Indies Industries Fair, 39 Oosteinde, Bandoeng, Java.

Applications for participation in the congress should be sent to the Secretary, Molenvleit East 3, Weltevreden, Java, who will arrange for hotel accommodations and trips.

Rubber Planting Notes.

A NEW BRAZILIAN TAPPING KNIFE.

IN the face of the rivalry of the East Indian plantations the more intelligent Brazilian rubber men have not gone to sleep. The study of improvements in cultivation, in gathering the crop and in preparing the latex has been going on for some years at *Seringal Miry*, the experiment station at Manáos. One result of this activity is the invention of the Amazonia tapping knife, by José Claudio de Mesquita, president of the *Club da Seringuéira*, to be used for the purpose of doing the least possible damage to the trees.



("A Seringueira.")
THE AMAZONIA TAPPING KNIFE.

Referring to the figures in the illustration, blade 1 cuts a channel in the bark with an inclination of 45 degrees, the depth of which is barely sufficient to let the latex run without overflowing the incisions made by blade 2 in the interior wall of the channels. The movable key 3 is provided with guide 4 that regulates the direction and depth of the cut, while the part 5 removes the pieces of bark from the curved blade. The key 6 is held between the thumb and the forefinger, and is moved or held in place, according to the service required of parts 4 and 5.

("A Seringueira.")
METHOD OF TAPPING AT SERINGAL MIRY.

Preliminary to tapping at *Seringal Miry* it is customary to mark off the circumference of trees, which must be at least ½-meter in girth three feet above the ground, into three longitudinal sections, each one of which in succession is to be tapped for two years, in order to return to the starting point in seven years. When the tree is more than a meter in girth, as shown in the picture, each of the three sections is divided into two or more equal portions of twenty to thirty centimeters each for tapping purposes.

POSITION OF PARA RUBBER.

Trade in Pará for the quarter ended with June was extremely depressed because the very low price of rubber was aggravated by a rise in exchange Pará, while the Amazon valley is passing through a crisis; it is impossible to produce rubber under the conditions prevailing in Brazil so as to compete with the best Eastern plantation rubber when it sells for 40 cents a pound. The fiscal year, July, 1918, to June, 1919, has been a poor one for rubber, the receipts being only 31,400 tons, as compared with 35,000 in 1917-1918 and 37,600 tons in 1916-1917; it is the smallest crop since 1903-1904 when the receipts were 30,390 tons. There has been a steady decrease in island rubber with an increase in the upriver production. The exports for the year were 13,265 tons to the United States, and 4,924 tons to Europe, while the exports for the first six months of 1919 were 19,492 tons to the United States and 7,532 tons to Europe. However, not all of this was sold.—"Board of Trade Journal."

RUBBER SEED OIL WASTE AMOUNTS TO $8,500,000.

It is estimated that on the rubber plantations of the East some 300 pounds of rubber seeds per acre fall to the ground and are allowed to rot, despite the $8.50 worth of valuable oil extractable from them and the various uses to which the husks and meal might be put. A further computation of this waste is interesting.

Of the 2,000,000 acres now embraced by Eastern rubber estates some 1,000,000 acres are now in bearing. This means that 150,000 tons of dried rubber seed kernels, go to waste annually. From these kernels 42 per cent of oil is extractable. In other words, 15,750 tons of oil worth $540 per ton and aggregating $8,500,000 are being wasted annually. For most purposes rubber seed oil is a very good substitute for linseed oil now selling at some $650 per ton, and has several times brought about five-sixths the price of the better oil. The cost of collecting and decorticating the seeds, packing and shipping the kernels to England is estimated at $50 a ton.

JAVA PLANTATIONS DAMAGED BY VOLCANO.

The plantations of the Rubber Trading Co., Limited, at Soerabaya, and the Djaboong Rubber Maatschappij at Serakkentjong, the Kroewoek of the Kroewoek Estates, Limited, and the Kali Koening of the Landbouw Mij., Oost-Java, were severely damaged by volcanic ash during the eruption of the volcano Kloet, near Batavia, Java, last May. The rubber plantations of Soember Petoeng, and, in fact, all plantations, have been greatly damaged by falling ash. The eruption prevented tapping for a period of about five weeks.

J. W WIJNAENDTS VAN RESANDT, WHO HAS BEEN FOR SEVEN years superintendent of the Anglo-Dutch Estates Agency, Limited, Batavia, Java, recently left that city for a permanent stay in The Netherlands. He is well known among planters of Middle and West Java and especially among those of East Java.

Mr. Wijnaendts van Resandt came to Java in 1902 where he acquired a practical knowledge of rubber culture, and later studied the cultivation of rubber trees in the Federated Malay States. For several years he served on the board of directors of the Netherlandsch-Indisch Landbouw Syndicaat (N. I. Agricultural Syndicate) and was also a member of the board of the Experiment Station at West Java.

HARBOR ON SUMATRA'S WEST COAST.

Pulau Bay, a few miles south of Benkulan, on the west coast of Sumatra, has been known for over 250 years as the safest harbor on that coast, and is famous as the "the bay of Selebar," the town from which the pepper came. A good many years ago a big Arab sailing junk sank at the entrance to the harbor and blocked it. Now efforts are to be made to remove the obstacle because the harbor is close to rubber and fiber plantations. There is, moreover, water-power near at hand.

BROWN BAST ON TAPPED HEVEA.

BROWN BAST is the most wide-spread and injurious plague of plantation rubber in the Far East, and is therefore being investigated in the laboratories of Ceylon, Malaya, Southern India and the Dutch East Indies. The disease and its effects are described by Professor T. Petch in a leaflet issued by the Ceylon Department of Agriculture.

Brown bast attacks the cortex of *Hevea*, apparently only in trees that have been tapped. The tree runs dry, the tapping cut ceasing to yield latex, either wholly or partially, and in the latter case the latex coagulates on reaching the dry part and blocks the cut, so that later latex runs down the stem of the tree instead of along the cut to the vertical channel. This diseased cortex is a yellowish gray, dotted with brown spots and streaks; it may also be sodden and watery. In well defined cases a brown line runs along the cut very near the cambium.

If let alone, the tissue outside the brown line may dry up, forming a scale which, when it pulls off or is removed, leaves a thin layer of laticiferous cortex, one or two millimeters thick, that is speckled or thin and develops nodules. Or else no scale appears, yet the nodules develop under the surface just the same. Then the tree cannot be tapped.

The final effect of brown bast is to form nodules or burrs which interfere with or stop the flow of latex. These are a secondary feature of the disease; if they did not develop it would not be so serious. The disease may attack the whole tree or vital parts or may appear on a portion only of the cortex. Nodules also appear in the cortex that are not formed by brown bast.

Three methods are employed to get rid of brown bast by removing the diseased cortex to the depth that is necessary. These are: stripping; scraping; after which the spot is painted with Brunolinum plantarium, in which Professor Petch has great faith, and tarring. Trees that are badly affected had better be destroyed.

As to the nature of the brown bast, scientific men still differ. A few still believe that it is a fungus or other microorganism which carries infection. Rands, who was an advocate of this theory, seems to have changed his opinion materially. In April he held that "brown bast is an accentuated condition of gum secretion, probably resulting from response of the tree to the present methods of tapping." On the other hand, in January, 1919, the mycologists Belgrave, Perry and Richards reported that they had been unable to discover any microorganic cause for the disease.

W. Bobilioff in the "*Archiev voor de Rubber Cultuur*" for May sums up the case in reporting his experiments. The disease either is caused by infection or is a physiological phenomenon. Investigators have been unable to discover the microorganism that could carry it or to produce the infection by putting sound bark in contact with the diseased. Bobilioff experimented with trees on which he tried excessive tapping, and brought on the disease at once. His explanation is that brown bast is formed by drawing the latex from the bark and the cause therefore is purely physiological. The brown degenerate substance gave the principal reactions for lignine; so he holds that it is not yet proved that it is a gum, as Rand asserts. Harrison connects it with wood pulp. The slightest trace of brown bark could be detected by a phloroglacin reaction, which colored the spot red. The severity of the disease depends on the general physiological condition of the trees.

Agriculturists, as contrasted with laboratory men, advise giving the trees a rest, in the first place, then, that the soil be manured and drained, etc. They suggest that trees be raised from seedlings instead of cuttings, as those are believed to be less subject to disease, and tapping be improved so as not to wound the trees so severely. All seem to agree that tapping and the condition of the tree have more to do with the disease than possible infection.

PLANTING RUBBER IN WEST DUTCH BORNEO.

By J. W. Evans.

SAY "Dutch East Indies" to an American rubber man and he thinks of Java, Sumatra and a few islands of comparatively slight importance. But only an exceptionally well-informed man would think of West Dutch Borneo. Concerning that region as a field for the rubber man, next to nothing is known. It is generally understood that there is considerable coconut growing along the coast from Paloh to Pontianak, but that's about all.

Rubber cultivation has grown enormously in West Borneo during the last ten years, and the only reason why the fact is not known and the opportunity not recognized is that almost none of the rubber estates are owned by Europeans or Americans. Almost 90 per cent of the rubber plantations are in the hands of Chinese, Malays, and Japanese.

The reason why so little European or American capital has found its way to the rubber cultivation of West Borneo is that the region has been a field for irresponsible speculation. Sound investors have been afraid to go in there because various estates were opened up either by people who knew nothing about rubber and the conditions in Borneo, or by people who formed syndicates purely for speculation, and got from under as soon as their object was accomplished.

In consequence of such fast and loose methods the country got a bad name which it was far from deserving, for the condition of soil, climate, labor, and transportation are such that extensive and profitable rubber cultivation is perfectly practicable there, and the field is new.

Borneo, as a field of rubber, compares favorably with the East coast of Sumatra, the Straits Settlements, the Federated Malay States, and even Java. As to climate, indeed, it is especially suitable. Rain falls there in right proportion all the year, and there is no dry season such as Java has to contend with. That the soil is excellent is shown by the rapid growth of trees and the large yield of latex.

Here are some production figures from one estate in West Dutch Borneo which was badly run, and so neglected, and which suffered so much from the wild boar that it might have been expected to produce poorly. Seven-year-old trees which were planted too close and had never been thinned, produced as a yearly average 3.65 pounds per tree. Compare that with the results from 7 to 9-year-old trees elsewhere. In Malacca the average annual yield per tree is 2.42 to 3.41 pounds; in Ceylon, .77 to 1.65 pounds; in West Java, 2.42 pounds; on Sumatra's East Coast, 3.98 pounds on choice estates, and 2.97 pounds on average estates.

By contrast, there is an exceptionally well-kept Chinese-owned estate in Sambas, a locality in West Dutch Borneo where the trees were well spaced, and the yield for 6 to 7-year-old trees amounted to 5.28 pounds per tree a year.

Contrary to the general impression, labor conditions in West Borneo compare favorably with those in the Federated Malay

States, the Straits Settlements and Sumatra East Coast; for these places depend for labor on emigration from Java, China and British Indies, while Borneo has an abundance of local laborers. The Dyaks are adapted for heavy work, such as felling jungle; and the Malays for light work, such as weeding, tapping and preparing the product; however, it is not to be understood from this that labor conditions in Borneo are ideal. A big increase in rubber cultivation there might make immigration necessary. But at present the estates owned by Europeans are worked with help locally obtained. Japanese contract labor, however, is sometimes cheaper.

Transport facilities are not what they should be, but that is met by locating estates near rivers by which very cheap transportation to harbors becomes possible. In the developed rubber regions such as Sumatra East Coast, thousands are spent yearly for the building and upkeep of roads, and for bullock carts and motor trucks to carry the rubber from the estates to the nearest railroads or port. This is costly. In Borneo a lighter costing 100 guilders, about $40, does the work; there is communication with Singapore three times a month

Here are some figures that seem to demonstrate that West Borneo deserves investigation by men who desire to invest in rubber plantations and prefer to do it in a new country:

	Average of Sambas Estates.	26 Java Estates.
Average number of trees per bouw (1.75+ acres).....	203	300
Age of trees	8	7
Average in bearing	497	170
Total output per year in pounds................	328,730	101,884
Number of trees in bearing.....................	93,666	27,955
Average yield per tree in pounds...............	3.45	3.65
Average number of trees per tapper.............	304	300
Average yield per day per tapper in pounds	2.95	1.41
Percentage of first-grade rubber...............	79.9	80
All-in-cost per pound, dry, in United States currency.	0.18	0.17

It must be borne in mind that most of the estates are in the hands of Malays and Chinese, who do not get anything like the yield of rubber that they might if they knew scientific rubber culture. What Borneo is capable of with the right kind of rubber culture is certainly worth attention and investigation.

RUBBER IN THE STATE OF VERA CRUZ, MEXICO.

(Special Correspondence.)

Many rubber plantations were located in Vera Cruz. The state has suffered much during the last two years. It is overridden with all kinds of bandits. Some claim to be political chieftains, like Felix Diaz and Pelaez, but the rest are plain bandits. Pelaez is controlling the oil zone below Tampico. Rubber grows in that neighborhood, but no big plantations are known to exist in the territory under Pelaez's control.

Indians are tapping wild trees to a certain extent and they are making nice "ponchos" or rubber coats. They buy from merchants in the Huasteca Hidalguense ready-made garments or "ponchos" made of plain cotton duck, and bring them to their native villages. Then they tap the *Castilloa* and brush the latex on the cotton garments. The latex is spread with an ordinary paint-brush, and between each coating the garments are exposed to the sun for drying. When finished, they have an amber color. The coating is generally made on both sides of the cotton duck. After the goods have been coated several times and are considered ready, they are returned to the merchants in Tulancingo, and other towns of some importance. Very often these Indians have a credit in those country stores, or they are forced to trade there for other reasons. The ponchos made by these Indians are very good sellers, although they do not look as well as imported waterproofs. Their main advantage consists in the fact that they do not stick. Merchants are getting very good prices for these garments as they last very long, and, considering the service they give, are not expensive. If necessary they can be repaired by coating with fresh latex and curing in the sun.

Felix Diaz has control over the southern part of the State of Vera Cruz, and where he is shifting from place to place there are several rubber estates, most of which have been abandoned. However, near San Andres Tuxtla, the large Hacienda de Montepio, owned by Senator Clark, did not suffer very much. The manager had to run, but the estate was left under the care of a Cuban foreman, and was not damaged badly; of course, implements, horses and mules were taken, but that is now considered a trifle in these days of wholesale looting.

Some plantations along the Isthmus line, running from Cordoba to Santa Lucrecia, have suffered so much that nearly all of them have been abandoned by their legitimate owners. The country there is overridden with bandits, and one of them, called Panuncio Martinez, is the most dangerous and cruel of all of them. The Carranzistas have not been able to catch him. For a long time his headquarters were at Hacienda del Palmar Grande, near Tezonapa, Vera Cruz, a very beautiful estate which had once been the property of the French firm of Lions Hermanos y Cia. of Puebla, and which became afterwards the property of a Scotch company. One of the brothers, Olsson-Seffer, was the manager for some time. The place has been ruined by the revolutionists, the same as the other neighboring plantations. A big banana plantation on the Rio Tonto has been abandoned, and the same can be said of the big sugar estate called La Oaxaqueña, near Santa Lucrecia.

Panuncio Martinez has been terrifying the whole district and from time to time, the Carranzistas attempt to chase him, making things worse for all the unlucky neighbors, because all the places near the headquarters of Panuncio Martinez are sacked and burned in order that he may not use them as a base or a shelter. This was the fate, about a year ago, of the plantation called La Union, of Isidro Barrios y Cia. The place chances to be on the road to El Palmar, yet the owners had no connection whatever with Panuncio Martinez and were begging for protection. The "expedition was a success," as the Carranzista ditty always states and "Panuncio was done." When retiring to Cordoba the Carranzistas burned La Union, that Martinez might not use it as a base or shelter. That is the method of pacifying the country used by the Carranzistas. Plantation owners are thrown from the frying-pan into the fire when they apply for protection. After such a raid of the Carranzistas, all the fowls, pigs, etc., of the poorer people and the farm-hands, or *peones,* have been taken along with every bit of foodstuff which had escaped from the greedy hands of Panuncio Martinez and other patriots of his class.

THE COST OF BUSINESS IN MEXICO.

One of the principal reasons why so few Americans have attempted to conduct mercantile business in Mexico is shown by the accompanying estimate of the annual expenses of such an enterprise furnished by a business man of Guaymas, Sonora.

State taxes on the business at 8 per cent annually..............	$200.00
60 per cent Federal tax on State tax...........................	120.00
State taxes of 2 per cent on retail sales, estimating that sales amount to $15,000 per year..................................	300.00
60 per cent Federal taxes on $300..............................	180.00
Stamp taxes on retail sales of $15,000 at 5 mills annually.......	75.00
Municipal taxes, considering the business as fifth class.........	50.00
60 per cent Federal tax on $50.................................	30.00
Water at $2.50 monthly, one year...............................	30.00
Electric lights	120.00
One telephone	53.80
Rent of building	900.00
Interest on a capital of $25,000 at 12 per cent annually.........	3,000.00
Salaries of office and store employees, including salary of manager	7,800.00
Minor expenses, such as paper, stationery, office fixtures........	142.20
Total	$13,000.00

Taking 25 per cent as a basis of profit on the cost price of the merchandise, it would require annual sales amounting to $75,000 to obtain a net income of $5,750, not counting the $3,000 which the capital would earn at 12 per cent.

In the estimate, taxes on wholesale transactions are not included, it being presumed that they are paid by the purchaser.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED AUGUST 5, 1919.

No. 1,311,883. Pneumatic tire. J. C. Eubank, Chicago, Ill.
1,311,999. Resilient wheel. W. Rokosz, Calumet, Mich.
1,312,072. Inner tube with transverse resilient springs. J. W. Bassham, Columbia, Tenn.
1,312,124. Rubber tire with internal air chamber. E. B. Killen, London, Eng.
1,312,200. Respirator. A. Patus, assignor of ½ to H. H. Mandel—both of South Bend, Ind.
1,312,415. Wheel with rubber tire. D. Moriarty, Oakland, Calif.
1,312,457. Pressure gage for tires. M. C. Schweinert, West Hoboken, and H. P. Kraft, Ridgewood—both in New Jersey. (Original application divided.)
1,312,482. Pneumatic tire. H. G. Imhoff, Waterloo, Ia.
1,312,506. Vehicle rim and tire. H. M. Fisk, Chicago, Ill.; N. A. Fisk, administratrix.

ISSUED AUGUST 12, 1919.

1,312,528. Rubber sole for turn shoes. G. Ferguson, Wollaston, Mass., assignor by mesne assignments to United Shoe Machinery Corp., Paterson, N. J.
1,312,535. Transversely split demountable rim for tires. C. W. Gressle, assignor by mesne assignments to The Standard Parts Co.—both of Cleveland, O.
1,312,681. Fountain pen. W. L. Chapman, Brooklyn, N. Y.
1,312,781. Waterproof boot with thin upper portion adapted to be folded over upon the ankle portion, etc. H. J. Flannery, Pittsburgh, Pa.
1,312,830. Electrically heated garment. C. E. Camm, Salt Lake City, Utah, assignor of ½ to W. H. Turver, Los Angeles, Calif.
1,312,923. Legging with encased resilient means for limiting movement. M. Rosenwasser, Astoria, N. Y.
1,312,941. Teat-cup for milking machines. C. M. Anderson, Waterloo, Ia.
1,313,007. Elastic non-inflatable tire. C. A. Morrison, Delaware, O.
1,313,021. Hot-water bottle. G. M. Scott, Scotts Mills, Ore.
1,313,037. Elastic fabric. C. Adams, East Rutherford, N. J.
1,313,118. Rubber heel. A. Santacroce, assignor of 3/10 to J. Grumbos and 3/10 to S. Sadaris—all of Elyria, O.
1,313,215. Garment supporter. T. L. Caudle, Wadesboro, N. C.

ISSUED AUGUST 19, 1919.

1,313,254. Resilient tire. J. W. and G. F. Burgess, Kansas City, Mo.
1,313,307. Suction-cup holding device for portable apparatus. J. B. Locraft, Washington, D. C.
1,313,400. Detachable heel. C. P. Maher and E. J. Fetherstonhaugh, Montreal, Que., Canada.
1,313,424. Cushion tire. H. H. Stern, Moscow, Ida.
1,313,442. Arch support. L. W. V. Wilms, Chicago, Ill.
1,313,506. Pneumatic tire. M. A. K. Shotwell, Miami, Fla.
1,313,553. Inflating valve for tires, etc. F. Nielsen, Boston, Mass., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.
1,313,566. Medicine dispenser. E. C. Trowbridge, Gloucester, Mass.
1,313,745. Gas mask and respirator. N. Schwartz, New York City.
1,313,749. Pneumatic tire. F. K. Small, Lisbon Falls, Me.
1,313,752. Jar-lifting tongs with rubber pads. H. C. Smith, Waterloo, Ia.
1,313,824. Demountable rim for tires. G. Knowling, Jr., St. John, Newfoundland.
1,313,868. Puncture-closing device for tires. B. Urich, Milwaukee, Wis.

REISSUE.

14,710. Rubber sponge over frame converting it into receptacle for soap, etc. R. F. Hobbs, Great Neck, N. Y. (Original No. 1,173,802, dated February 29, 1916.)

ISSUED AUGUST 26, 1919.

1,313,913. Automobile wheel. H. D. Rey, Avarua, Rarotonga Island, Cook Islands.
1,313,914. Flush-tank bulb. F. T. Roberts, Cleveland, O.
1,313,923. Garter. W. H. Stevens, New York City. (Original application divided.)
1,313,924. Pneumatic arch and heel support. B. Stewart, Erie, Pa.
1,313,979. Air-valve attachment for tires on disk wheels. F. Bernardi, Stockton, Calif.
1,314,104. Fountain pen and clip. J. C. Wahl, Chicago, Ill., assignor to The Wahl Co., Wilmington, Del.
1,314,110. Sectional demountable rim for tires. J. C. Youngblood, Atwood, Kans.
1,314,158. Fountain comb. A. R. Spielberger, Atlanta, Ga.
1,314,185. Bathing-suit or life-preserver. J. M. Combs, Akron, O.
1,314,299. Life-saving union suit. F. Zaccard and T. P. McDonough, Chicago, Ill.
1,314,342. Pneumatic roll, with inflatable inner cushion. G. A. Lawrence, Woburn, assignor to The Turner Tanning Machinery Co., Peabody—both in Mass.
1,314,343. Jointure for vulcanized rubber parts, as in hot-water bottles. J. L. Mahoney, New Haven, assignor to The Goodyear India Rubber Glove Manufacturing Co., Naugatuck—both in Conn.
1,314,374. Tube with filter, for drinking from springs, etc. B. A. Stair, Los Angeles, Calif.
1,314,393. Rubber heel. D. D. Granger, New London, O.
1,314,414. Expansible wheel rim. J. H. M. Michon, Washington, D. C.
1,314,415. Collapsible wheel rim. J. H. M. Michon, Washington, D. C.
1,314,416. Collapsible wheel rim. J. H. M. Michon, Washington, D. C.

THE UNITED KINGDOM.

ISSUED AUGUST 7, 1919.

127,727. Metallic diving-suit with rubber-covered finger joints. R. de Graff, 571 West 139th street, New York City, U. S. A.
127,776. Shaped toe and heel portions connected by elastic straps, for repairing galosh portion of shoes of satin, velvet, etc. F. G. Knowles-Foster, 72 Oakwood Court, Kensington, London.
127,791. Fountain pen. C. R. Keeran, 360 East Grand avenue, Chicago, Ill., U. S. A.
U. S. A.
127,792. Surgical sand-bag covered with loose or adherent envelope of seamless rubber. K. R. Banks, 11A Earl's Court Square, London.
127,795. Pneumatic sucker fasteners with auxiliary suction cup inside and formed integrally with main cup. C. M. Wolcott, 321 West 118th street, New York City, U. S. A.
127,818. Tire valve. Michelin & Cie., Clermont-Ferrand, France. (Not yet accepted.)
127,884. Telephones for aviators, with elastic bands, rubber gaskets, etc. Western Electric Co., Norfolk House, Victoria Embankment, Westminster. (Le Matériel Téléphonique Société Anonyme, 46 avenue Breuteuil, Paris.)
128,009. Fountain pen and clip. E. C. R. Marks, 57 Lincoln's Inn Fields, London. (Conklin Pen Manufacturing Co., Toledo, O., U. S. A.)
128,024. Cushion tire with soft rubber tread and hard rubber base. F. W. Howorth, 10 New Court, Lincoln's Inn Fields, London. (K., F. & C. Tire & Rubber Corp., 610 MacBain Building, Roanoke, Va., U. S. A.)
128,063. Rubber tire. F. W. Howorth, 10 New Court, Lincoln's Inn Fields, London. (K., F. & C. Tire & Rubber Corp., 610 MacBain Building, Roanoke, Va., U. S. A.)
128,113. Chewing gum containing caffeine or a derivative. S. W. Cramer, 401 East Morehead street, Charlotte, N. C., U. S. A.

ISSUED AUGUST 13, 1919.

128,309. Breathing apparatus. R. H. Davis, 187 Westminster Bridge Road, London.
128,340. Hair-curling appliance. C. Nessler, 657 Fifth avenue, New York City, U. S. A.
128,384. Saddle-tops for cycles, etc., made of vulcanizable, fiberized rubber and comminuted cotton, reinforced by wire or cords. J. Kelley, 41 Spon street, Coventry, and H. Jelley, Westover, Selly Park, Birmingham.

ISSUED AUGUST 20, 1919.

128,426. Rubber pencil shield. G. J. Page, 60 Myddleton Road, Bowes Park, London.
128,505. Pneumatic-tire rim. A. Wroe, Sydney Grove, Lamcote, Radcliffe-on-Trent, Nottinghamshire, and E. Jennings, 7 St. Peter's Place, Broad street, Birmingham.
128,529. Latex-collecting spout. W. J. Thornmill, 4 Millbank street, Westminster.

ISSUED AUGUST 27, 1919.

128,844. Flush-tank bulb-valve of rubber, etc. F. T. Roberts, 1105 Lakeview Road, and R. H. Rosenfield, 1895 East 71st street—both of Cleveland, O., U. S. A.

THE DOMINION OF CANADA.

ISSUED AUGUST 19, 1919.

192,194. Respirator. E. D. Rogers, Oakdale, La., U. S. A.
192,215. Breast pump. Becton Dickinson & Co., Rutherford, assignee of O. O. R. Schwidetzky, Hasbrouck Heights—both in New Jersey, U. S. A.

ISSUED AUGUST 26, 1919.

192,252. Truck tire. H. B. Foley, Minneapolis, Minn., U. S. A., and M. L. Foley, Toronto, Ont.
192,279. Resilient wheel. S. Grossman, New York City, U. S. A.
192,280. Inner tube. J. H. Hamlin, Winston-Salem, N. C., U. S. A.
192,281. Wheel with solid core, for carrying pneumatic tire. W. H. Hayter, South Norwood, London, S. E. 25, Eng.
192,295. Hot-water bottle. A. H. Leighton, McMinnville, Ore., U. S. A.
192,301. Captive balloon. J. N. Lewis, Detroit, Mich., U. S. A.
192,333. Diving dress. F. W. Walters, Auckland, N. Z.
192,335. Resilient wheel. S. A. Wheatley, La Grande, Ore., U. S. A.
192,350. Safety spring slings for parachutes. The E. R. Calthrop's Aerial Patents, Limited, assignee of E. R. Calthrop—both of London, Middlesex, Eng.

ISSUED SEPTEMBER 2, 1919.

192,471. Parachute. The Goodyear Tire & Rubber Co., assigne of R. H. Upson, both of Akron, O., U. S. A.

THE FRENCH REPUBLIC.

PATENTS ISSUED, WITH DATES OF APPLICATION.

490,301. (May 29, 1918.) Improvements in the manufacture of gloves, P. C. Ayers.
490,333. (May 31, 1918.) Pneumatic decoy for blackbirds. M. Verando.
490,630. (September 4, 1916.) Hermetic seal for all kinds of tuns, casks, etc. B. Epinat.
490,688. (June 29, 1918.) Rim for pneumatic tire. Stinements Rim Co.
490,719. (July 2, 1918.) Lift for shoe heels. T. Henne.
491,679 (May 13, 1918.) Resilient wheel. H. W. Blacklock and M. W. Brill.
491,757. (September 14, 1918.) Tire valve. A. Schrader's Son, Inc., Brooklyn, N. Y., U. S. A.

Chemical Patents will be found on pages 24, 25. Machinery Patents on pages 27, 28.

491,758. (September 14, 1918.) Suction pump coupling, etc. A. Schrader's Son, Inc., Brooklyn, N. Y., U. S. A.

491,777. (September 14, 1918.) Improvements in wheel tires. F. W. Edwards.

491,785. (September 10, 1918.) Shoe with pneumatic sole. G. E. C. Gerber.

491,717. (September 12, 1918.) Improvements in a rectal douche. T. H. McNamara.

491,854. (September 9, 1918.) Wheel tire and its method of manufacture. K., F. & C. Tire & Rubber Corp.

491,862. (September 20, 1918.) Improvements in applying flexible rubbers to replace spring-plates of vehicles. W. F. Cottrell.

462,063. (October 3, 1918.) Improvements in rubber tires, particularly solid tires. Société Française B. F. Goodrich.

492,095. (December 22, 1917.) Pneumatic wheel with internal pressure, applicable to all vehicles and particularly to automobiles, motorcycles, airplanes, etc. J. M. C. Semery.

492,022. (September 30, 1918.) Improvements in artificial limbs. C. A. Adams.

492,121. (August 3, 1916.) Life-saving apparatus. R. Kubja.

492,232. (October 10, 1918.) Improvements in automobile wheels, etc. E. A. Vivinus and J. G. Raphael.

492,172. (October 5, 1918.) Improvements in leggings. Mme. E. Charlet, née B. F. Bergougnan.

492,172. (October 5, 1918.) Improvements in removable nails for heels. G. W. Berry.

NEW ZEALAND.

ISSUED JULY 10, 1919.

41,351. Reinforced cover for pneumatic tires. W. J. Dalby, Orient Road, Magill, South Australia.

ISSUED JULY 24, 1919.

40,490. Resilient wheel. C. C. Crump, McKenzie Road, Khandallah, Wellington, N. Z.

40,775. Inner tube of shingle construction. I. B. Jeffries (trading as Isaac Benjamin), 3 John street, Llanelly, Carmarthen, Wales.

41,552. Safety foot for ladder, crutch, etc. H. H. Amadio, 150 Regent street, Redfern, near Syrney, N. S. W.

41,665. Corset with elastic vest section. A. C. Hopwood, 408 Commerce House, Flinders street, Melbourne, Victoria. (Nominee of the Dominion Corset Co., 29-45 Dorchester street, Quebec, Canada, assignee of S. J. Newman, New Haven, Conn., U. S. A.)

TRADE-MARKS.

THE UNITED STATES.

No. 99,332. The words Arch Builder—arch supports. Alexander E. Block, St. Louis, Mo.

100,808. The word Loxol—soles of artificial leather. Madelether Co., Saugus, Mass.

105,530. The words Golden Rule—rubber boots and shoes. United States Rubber Co., New York City.

109,279. The words Life Savers—chewing gum, etc. Mint Products Co., New York City.

111,216. The word Kempko—artificial leather. Charles H. Kemper, Westport, Conn.

115,952. The word Repairo in white letters against a black rectangle—rubber patches for repairing rubber or fabric articles. Helmer E. Errickson, Chicago, Ill.

116,662. Repesentation of a rubber-heel lift bearing the words "Diamond Grip" and a knurled diamond—rubber heels. Robert E. Miller, Inc., New York City.

116,683. The word Fisk—rubber tires. The Fisk Rubber Co., Chicopee Falls, Mass.

117,226. Representation of a shield, quartered, bearing a conventional design—rubber-tire casings. The General Tire & Rubber Co., Akron, O.

117,693. The words Repco, Service, Quality, Reliability, Value within the center and border of a white-bordered black diamond—rubber tires. Republic Rubber Tire & Shoe Co., New York City.

117,911. The word Winner—rubber and canvas bicycle tires and tubes. Simmons Hardware Co., St. Louis, Mo.

118,029. The word JiTs within a circle—rubber heels and soles. Charles M. Wolcott, Baltimore, Md.

118,185. The words Horse-Shoe Tires superimposed above the representation of a horse-shoe. Racine Auto Tire Co., Racine, Wis.

118,363. The word Cactus—cement for use in patching rubber and fabric goods. Automotive Supply Co., Dallas, Tex.

118,381. The word Duoplex within a double-outlined oval—rubber tires. Austin Holcomb, Los Angeles, Calif.

119,242. The outline of a mitten—pneumatic tires. Worth L. Mitten, Davenport, Ia.

THE DOMINION OF CANADA.

24,809. The words Joy Riders—chewing gum, etc. Frederick Weeb Brooke, Toronto, Ont.

24,816. Representation of a piece of rope in the form of a circle enclosing the words Miner's and Triumph and a device resembling the letter M—rubber footwear, heels and soles, clothing, coverings, cloth, belting, hose, tires, insulating material, and rubber cement. The Miner Rubber Co., Limited, Montreal, Que.

24,817. Representation of a piece of rope in the form of a circle enclosing the words Miner's and Ace and a device resembling the letter M—rubber footwear, heels and soles, clothing, coverings, cloth, belting, hose, tires, insulating material, and rubber cement. The Miner Rubber Co., Limited, Montreal, Que.

24,865. The word Guard—pneumatic tires, etc. Van der Linde Rubber Co., Limited, Toronto, Ont.

THE FRENCH REPUBLIC.

TO AMERICANS.

26,480. The words Warner Shaving Brush "Everything but the Razor"—shaving brushes with bristles set in rubber. Warner-Patterson Co., 914 South Michigan avenue, Chicago, Ill., U. S. A.

26,463. The word Fabrikoid—imitation leather. Du Pont Fabrikoid Co., Wilmington, Del., U. S. A.

NEW ZEALAND.

TO AMERICANS.

15,154. The words Vulco-Cord—machine belts, particularly automobile-fan belts. The Gates Rubber Co., Denver, Colo., U. S. A.

DESIGNS.

THE UNITED STATES.

No. 53,672. Tire. Patented August 5, 1919. Term 3½ years. Arthur Breitenstein, Akron, assignor to Richard J. Birch, Cleveland—both in Ohio.

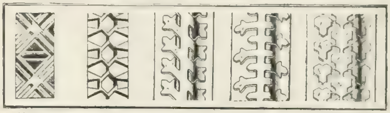
53,675. Tire. Patented August 5, 1919. Term 7 years. Isaac R. Davies, Lakewood, O.

53,676. Tire. Patented August 5, 1919. Term 7 years. Isaac R. Davies, Lakewood, O.

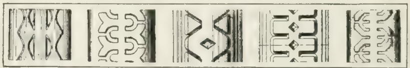
53,677. Tire. Patented August 5, 1919. Term 7 years. Isaac R. Davies, Lakewood, O.

53,692. Tire. Patented August 5, 1919. Term 14 years. Robert J. Stokes, assignor to Thermoid Rubber Co.—both of Trenton, N. J.

53,693. Tire. Patented August 5, 1919. Term 14 years. Robert J. Stokes, assignor to Thermoid Rubber Co.—both of Trenton, N. J.



53,692. 53,693. 53,675. 53,676. 53,677.



53,709. 53,727. 53,749. 53,750. 53,672.

53,709. Tire. Patented August 19, 1919. Term 14 years. C. W. Greene, assignor to The Bowling Green Rubber Co.—both of Toledo, O.

53,727. Tire. Patented August 26, 1919. Term 14 years. Arthur Breitenstein, Akron, assignor to Richard J. Birch, Cleveland—both in Ohio.

53,736. Automobile running board. Patented August 26, 1919. Term 14 years. John T. Hayne, Detroit, Mich.

53,737. Automobile running-board mat. Patented August 26, 1919. Term 14 years. John T. Hayne, Detroit, Mich.

53,749. Tire. Patented August 26, 1919. E. A. Reid, Trenton, N. J., assignor to Ajax Rubber Co., Inc., Millbrook, N. Y.

53,750. Tire. Patented August 26, 1919. E. A. Reid, Trenton, N. J., assignor to Ajax Rubber Co., Inc., Millbrook, N. Y.

EDUCATIONAL MOTION PICTURES FOR FACTORY ENTERTAINMENTS.

The Bureau of Commercial Economics, Washington, D. C., circulates free educational motion picture films just as a Carnegie library circulates books without charge. It is an altruistic association which makes no profit on its films, being supported by endowment, annuity and voluntary subscription. With 21,000,000 feet of film on almost every conceivable subject, it has the largest educational film library in the world. Three subjects taken at random from the Bureau's catalog are "The Milk of the Tree" (Rubber), "Making Raincoats," "For the Common Good" (Welfare), Firestone Plant.

The Bureau provides the best source of films suitable for exhibition to rubber and allied trade employes in factories and club houses. Francis Holley, the director, urges employers of labor to let their work people feel that such picture shows belong to them. The employer could offer to provide space and equipment if the employes will run the show—select programs, order the films, etc. Thus a point of cooperation would be established between employer and employes that would be worth many times the cost of providing the "theatre." When necessary the Bureau will send a truck fully equipped to show the pictures outdoors at night.

Review of the Crude Rubber Market.

NEW YORK.

September has been marked by a rather remarkable advance in the price of rubber of all grades that has lasted throughout the month. Ribbed smoked sheet, which sold for 44½ cents spot at the close of August, rose as high as 55 cents, at which price sales were made. There was a slight decline in prices towards the close of the month, due to speculative dealers going a little ahead of the actual demand, but the market is very firm and the demand for rubber strong. Manufacturers, not only of tires but of all kinds of goods, have been buying largely and have seemed ready to pay higher prices, but only for the amount of rubber they actually need. There has been a good deal of trading among dealers, which has caused some slight fluctuations in prices, but the demand is from consumers, so that prices are likely to stay up till they are supplied. The prices in the London market are higher than in New York.

The assertions that many Far Eastern planters have held back part of the product of their plantations out of patriotic regard for the requests of the British Government are not wholly credited by American importers, who do not believe that Singapore commands any very large reserve stock of rubber.

The Brazil market was quiet and inactive; the quantity yielded now is inconsiderable in comparison with the world's product and consumers are willing to pay the higher price only for the quantity they need, which is limited.

For guayule and balata the market has been very quiet.

Prices for plantation and for South American rubber at the beginning and toward the close of the month are shown in the following quotations:

Plantation *Hevea*. August 30, first latex crêpe, spot 45½ cents, October-December 46½ cents, January-June 47 cents, January-December 1920, 48½ cents. September 22, first latex crêpe, spot 50 cents, October-December 50 cents, January-March 51 cents, January-June 51 cents, January-December 1920 52 cents.

August 30, ribbed smoked sheets, spot 44½ cents, October-December 45½ cents, January-March 45½ cents, January-June 46 cents, January-December 1920, 47½ cents. September 22, ribbed smoked sheets, spot 49 cents, October-December 49 cents, January-March 50 cents, January-June 50 cents, January-December 1920, 51 cents.

August 30, No. 1, amber crêpe, spot 42 cents, October-December 4½ cents. September 22, No. 1 amber crêpe, spot 47 cents.

August 30, clean thin brown crêpe, spot, 40 cents, October-December, 42½ cents, September 22, clear brown crêpe, spot 48 cents.

August 30, No. 1, roll brown crêpe, spot 32. September 22, No. 1 roll brown crêpe, spot 36 cents, October-December, 36 cents, January-March 38 cents.

South American Pará and Cauchos. Spot Prices: August 30, upriver fine 54½ cents, islands fine 47½ cents, upriver coarse 32 cents, islands coarse 22 cents, Cametá coarse 22 cents, caucho ball upper 32 cents. September 22, upriver fine, 55 cents, islands fine 49 cents, upriver coarse 34 cents, islands coarse 22½ cents, Cametá coarse 22 cents, caucho ball 33½ cents.

NEW YORK QUOTATIONS.

Following are the New York spot quotations, for one year ago, one month ago and on September 23, the current date:

	October 1, 1918. Free Rubber.	September 1, 1919.	September 23, 1919.
PLANTATION HEVEA—			
First latex crêpe	63 @	45½ @	49½ @
Amber crêpe No. 1	60 @	41½ @	46½ @
Amber crêpe No. 2	60 @	40½ @	45½ @
Amber crêpe No. 3	58 @	39½ @	44½ @
Amber crêpe No. 4	57 @	38½ @	43½ @
Brown crêpe, thick and thin clean	60 @	38½ @	44½ @
Brown crêpe, thin specky	50 @	36½ @	42½ @
Brown crêpe, rolled	44 @	32 @	37 @
Smoked sheet, ribbed, standard quality	62 @	44 @	48½ @
Smoked sheets, plain, standard quality	61 @	41 @	45 @
Unsmoked sheet, standard quality	60 @	39 @	42 @
Colombo scrap No. 1	46 @	33 @	38 @
Colombo scrap No. 2	44 @	31 @	36 @
EAST INDIAN—			
Assam crêpe	58 @	@	None
Assam onions	54 @	@	None
Penang block scrap	37 @	@	None
PONTIANAK—			
Banjermassin	15 @	10¾ @	12 @
Palembang	16 @	11¾ @ 12	None
Pressed block	25 @	21 @	24 @
Sarawak	14 @	9¾ @	None
SOUTH AMERICAN—			
PARAS—			
Upriver fine	68 @	54½ @	54½ @
Upriver medium	63 @	51½ @	52 @
Upriver coarse	40 @	31½ @	33 @
Upriver weak, fine	50 @	40 @	41 @
Islands, fine	59 @	48 @	47½ @
Islands medium	52 @	44 @ 45	45 @
Islands, coarse	27 @	21 @	22 @
Cametá, coarse	28 @	21½ @	22½ @
Madeira, fine	@	55 @	56 @
Acre Bolivian, fine	@	54½ @ 55	55 @ 55½
Peruvian fine	67 @	53 @	52 @
Tapajos fine	60 @	53 @	53 @
CAUCHO—			
Lower caucho ball	36 @	29 @	31½ @
Upper caucho ball	40 @	31 @	33 @
MANICOBAS—			
Ceara negro heads	37 @	*34 @	38 @
Ceara scrap	37 @	*29 @	28 @
Maniçoba (30% guarantee)	35 @	*32 @	35 @
Mangabeira thin sheet	39 @	*38 @	38 @
CENTRALS—			
Corinto scrap	39 @	31 @	33 @
Esmeralda sausage	39 @	31 @	32 @
Central scrap	@	31 @	32 @
Central scrap and strip	@	29 @	29 @ 30
Central wet sheet	35 @	23 @	23 @
Guayule (20% guarantee)	48 @	25 @	24 @
Guayule, dry	28 @	35 @	35 @
AFRICANS—			
Niger flake, prime	33 @	@	@
Benguela, extra No. 1, 28%	29 @	*24 @	@
Benguela No. 2, 32½%	48 @	*25 @	25½ @
Congo prime, black upper	48 @	34½ @	39 @
Congo prime, red upper	@	34 @ 35	@
Rio Nunez ball	55 @	@	@
Rio Nunez sheets and strings	@	@	@
Conakry niggers	55 @	@	@
Massai sheets and strings	55 @	@	@
GUTTA PERCHA—			
Gutta Siak	28 @	20 @ 23	25 @
Red Macassar	3.00 @	2.50 @ 2.60	None
BALATA—			
Block, Ciudad Bolivar	71 @	70 @ 74	76 @
Colombia	61 @	56 @ 58	56 @
Panama	59 @	45 @ 48	42 @
Surinam sheet	95 @	90 @ 92	@
amber	97 @	92 @ 94	@

* Nominal.

COMPARATIVE HIGH AND LOW SPOT RUBBER PRICES.

	September. 1919.[1]		1918.		1917.	
PLANTATIONS:						
First latex crêpe	$0.55½ @	$0.45½	$0.63 @	$0.60½	$0.69 @	$0.66½
Smoke sheet ribbed	.54 @	.44½	.62 @	.59½	.67 @	.65
PARAS:						
Upriver, fine	.55¼ @	.54½	.68 @	.68	.69 @	.67
Upriver, coarse	.33 @	.32	.40 @	.40	.48½ @	.46½
Islands, fine	.48 @	.47½	.59 @	.59	.58 @	.56½
Islands, coarse	.22 @	.21½	.27 @	.27	.30 @	.29
Cametá	.22 @	.21½	.28 @	.28	.31 @	.30

[1] Figured only to September 22.

RECLAIMED RUBBER.

The dullness of the past summer is still continuing. Dealings are limited to routine needs with no disposition to anticipate future demands. The demand continues fair for reclaims for insulation purposes. The prices for stock reclaims remain fixed and firm.

NEW YORK QUOTATIONS.

SEPTEMBER 25, 1919

Subject to change without notice.

Standard reclaims:				
Floating	lb.	.30	@	.35
Friction	lb.	.25	@	.35
Mechanical	lb.	.11	@	.16
Red	lb.	.20	@	.25
Shoe	lb.	.15	@	.15⅜
Tires, auto	lb.	.15	@	.16¾
truck	lb.	.11½	@	.12½
White	lb.	.22	@	.25

THE MARKET FOR COMMERCIAL PAPER.

In regard to the financial situation, Albert B. Beers, broker in crude rubber and commercial paper, No. 68 William street, New York City, advises as follows:

"During September there has been a fair demand for paper, mostly from out-of-town banks, and the best rubber names have been taken at 5½ to 5¾ per cent, and those not so well known 6 to 6¼ per cent."

WEEKLY RUBBER REPORT.

GUTHRIE & CO., LIMITED, Singapore, report [July 31, 1919]:

At the weekly rubber auctions held yesterday and to-day, manufacturing interests were well represented, and there was a good demand for all grades. At the commencement of the sales, fine pale crêpe realized up to 73 cents (two lots sold for 73¼ cents), while ribbed smoked sheet was readily taken up at up to 71½ cents. On resuming to-day the demand did not appear to have fallen away to any appreciable extent, and closing prices were 73 cents for crêpe and 70 cents for sheet.

Brown and dark crêpe were in good demand at from 1 to 1½ cents advance on last week's prices.

The quality cataloged was 1,022 tons, of which 899 tons were offered and 694 tons sold.

The following is the course of values:

	In Singapore, per Pound,[1]			Sterling Equivalent per Pound in London.		
Sheet, fine ribbed smoked	67½c	@	71½c	1/ 9⅝	@	1/10¾
Sheet, good ribbed smoked	65	@	67	1/ 8⅞	@	1/ 9⅜
Sheet, plain smoked	59	@	..	1/ 7⅛	@	......
Crêpe, fine pale	69¾	@	73	1/10⅜	@	1/11⅜
Crêpe, good pale	60½	@	68½	1/ 7⅞	@	1/10⅛
Crêpe, fine brown	55	@	59½	1/ 6¼	@	1/ 7½
Crêpe, good brown	48	@	54½	1/ 4½	@	1/ 6⅛
Crêpe, dark	43½	@	50	1/ 3	@	1/ 4⅞
Crêpe, bark	38	@	45	1/ 1½	@	1/ 3½

[1] Quoted in S. S. Currency—$1 = $0.567.

BATAVIA RUBBER MARKET.

HERMANS, MARSMAN & CO., Batavia, report [June 15—July 15, 1919].

The market showed some improvement during the last month and several big parcels changed hands. There was more demand for forward deliveries especially from the side of American buyers. The signing of peace caused only a small increase of prices. The market closed with the following quotations:

	In Batavia Per ½-kilo.[1] Guilders.	Equivalent Per ½-kilo in U. S. Currency.
Fine pale crêpe	1.20	$0.480
Prime smoked sheets	1.19	.476
Fine pale crêpe, basis 75 per cent	1.08	.432
Off crêpe	1.12	.448

[1] Quoted per ½-kilo (1.1 lb.) in Dutch Indian guilders ($0.40).

PLANTATION RUBBER EXPORTS FOR MALAYA.

(These figures include the production of the Federated Malay States, but not of Ceylon.)

	January 1 to March 31.			Jan. 1 to. Feb. 28,	
	Singapore.	Malacca.	Port Swettenham.	Penang.	Totals.
To United Kingdom...pounds	12,561200	......	17,665,125	3,512,400	33,738,725
The Continent..	6,507,200	......	......	......	6,507,200
Japan	8,122,800	......	......	211,200	8,334,000
Ceylon	50,000	......	844,024	......	894,024
United States and Canada..	90,528,400	......	......	2,052,400	92,580,800
Australia	88,000	......	......	......	88,000
China (Hongkong)	......	......	......	......	......
Other Countries	64,800	......	......	......	64,800
Totals	117,922,400	......	18,509,149	5,776,000	142,207,549
For the year 1918	225,100,000	837,600	......	12,479,200	238,416,800
For the year 1917	177,901,200	15,113,200	......	23,402,000	216,416,400
For the year 1916	135,535,954	7,167,346	3,660,840	30,643,565	177,007,705
For the year 1915	86,067,657	7,898,984	821,445	28,580,663	123,368,749
For the year 1914	43,534,177	5,218,379	2,052,620	21,912,567	72,171,743

(Compiled by Barlow & Co., Singapore.)

UNITED STATES CRUDE RUBBER IMPORTS FOR 1919 (BY MONTHS).

1919.	Plantations.	Paras.	Africans.	Centrals.	Guayule.	Manicoba and Matto Grosso	Totals for 1919	Totals for 1918.
January ...tons	4,906	2,141	2	114	72	...	7,235	16,084
February	14,079	2,701	489	100	87	...	17,456	13,108
March	23,680	3,808	337	211	187	...	28,223	17,161
April	24,678	2,794	90	144	330	110	28,146	13,425
June	13,645	1,706	264	263	390	51	16,319	24,124
July	17,645	121	16	82	101	...	17,965	16,092
August	8,221	2,594	137	74	41	...	11,067	10,421

(Compiled by The Rubber Association of America, Inc.)

CEYLON RUBBER IMPORTS AND EXPORTS.

IMPORTS.

	January 1 to July 28.	
Crude rubber:	1918.	1919.
From Straits Settlements ...pounds	1,471,419	1,438,408
India	1,519,467	768,826
Burma and other countries	3,107	......
Totals	2,993,993	2,206,034

EXPORTS.

	1918.	1919.
To United Kingdom ...pounds	10,144,711	17,694,924
Belgium	......	29,120
France	100,642	330,010
[1]Victoria	504,189	98,755
[1]New South Wales	230,947	150,612
United States	12,307,425	37,882,106
Canada and Newfoundland	4,804,976	260,026
India	2,329	2,313
Straits Settlements	......	454
Japan	159,018	175,386
Totals	28,254,237	56,623,786

[1] These figures include cargoes for transshipment to New Zealand, other ports of Australia, and dependencies.
(Compiled by the Ceylon Chamber of Commerce.)

PLANTATION RUBBER EXPORTS FROM JAVA.

	June.		Six Months Ended June 30.	
	1918.	1919.	1918.	1919.
To Holland ...kilos	......	57,000	......	179,100
England	......	134,000	1,659,000	3,815,000
France	......	......	......	170,000
United States	673,000	2,231,000	4,162,000	10,107,000
Canada	......	......	......	36,000
Singapore	1,349,000	427,000	4,366,000	4,231,000
Japan	70,000	......	634,000	179,000
Australia	......	26,000	......	169,000
Other countries	510,000	1,000	510,000	12,000
Totals	2,602,000	2,876,000	11,331,000	18,904,000
Ports of origin:				
Tandjong Priok	975,000	1,550,000	5,406,000	9,148,000
Samarang	14,000	18,000	104,000	222,000
Soerabaya	1,149,000	1,159,000	5,357,000	7,487,000
Tjilatjap	.....	149,000	......	149,000
Totals	2,138,000	2,876,000	10.867,000	17,006,000

FEDERATED MALAY STATES RUBBER EXPORTS.

An official report from Kuala Lumpur states that the July exports of rubber from the Federated Malay States amounted to 8,640 tons as compared with 7,094 tons in June, and 5,706 tons in the corresponding month last year. For seven months of the present year the export amounted to 59,357 tons against 46,263 tons in 1918, and 45,274 tons in 1917.

Appended are the comparative statistics:

	1917.	1918.	1919.
January ...tons	5,995	7,588	7,163
February	7,250	6,820	10,809
March	7,088	7,709	10,679
April	5,955	7,428	7,664
May	7,179	5,851	7,308
June	6,009	5,161	7,094
July	5,798	5,706	8,640
Totals	45,274	46,263	59,357

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official report from Singapore states that the export of rubber from Straits Settlements ports in the month of July amounted to 7,818 tons (of which 135 tons were transshipments), which compares with 50,059 tons in June, and 1,978 tons in the corresponding month last year. The total for seven months of the present year is 90,543 tons, compared with 44,158 tons for the corresponding period in 1918, and 46,867 tons in 1917. Appended are the comparative statistics:

	1917.	1918.	1919.
January ...tons	3.562	4,302	14,404
February	6,495	2,334	15,661
March	8,299	8,858	20,908
April	6,103	6,584	10,848
May	6,282	13,587	15,845
June	8,775	6,515	5,059
July	7,351	1,978	7,818
Totals	46,867	44,158	90,543

CRUDE RUBBER ARRIVALS AT ATLANTIC AND PACIFIC PORTS AS STATED BY SHIPS' MANIFESTS.

PARAS AND CAUCHO AT NEW YORK.

	Pounds					
	Fine.	Medium	Coarse	Caucho.	Mixed Rubber.	Total Pounds.
August 25. By the S. S. *Gregory*, from Manáos.						
Poel & Kelly	33,750	4,426	42,241	....	....	80,417
Pell & Dumont, Inc.	....	...	4,140	82,220	....	86,360
H. A. Astlett & Co.	5,940	660	480	.....	....	7,080
Alden's Successors, Inc.	....	....	20,899	.....	....	20,899
G. Amsinck & Co., Inc.	12,343	990	6,240	29,920	....	39,493
A. Souza	9,570	3,795	1,860	38,420	....	53,645
Coway & Co.	26,730	1,980	3,840	9,180	....	41,730
Various	154,440	25,410	9,600	125,800	....	315,250
August 21. By the S. S. *Benedict*, from Manáos						
Poel & Kelly	217,051	28,838	79,433	3,956	[2] 8,543	337,821
Raw Products Co.	....	... ..	220	.....	....	57,200
Meyer & Brown, Inc.	63	....	240	401	[3]2,558	222,678
General Rubber Co.	341	2	229,211	229,140	....	3,133,480
H. A. Astlett & Co.	314	4	154	259	....	268,171
Winter, Ross & Co.	1	. .	2	120	....	42,750
G. Amsinck & Co., Inc.	[6]20	. .	530	[6]39	....	68,422
W. R. Grace & Co.	....	.. ..	....	26	....	9,152
Gaston, Williams & Wigmore	166	12	.....	....	....	65,970
Neuss, Hessiein & Co.	..	... ...	....	....	[3]398	54,182
Various	1,041	148	101	135	....	502,757
August 22. By the S. S. *Byron*, from Pará.						
General Rubber Co.	....	....	....	....	....	130,448
G. Amsinck & Co., Inc.	44,860	4,480	6,720	....	....	56,000
Gaston, Williams & Wigmore	15,500	....	....	....	....	15,500
H. A. Astlett & Co.	....	....	....	....	....	147,808
September 5. By the S. S. *Gen. O. H. Ernst*, from Cristobal.						
G. Amsinck & Co., Inc.	....	....	.... ..	1,020	....	1,020
September 16. By the S. S. *Cuthbert*, from Pará, Manáos and Equitos.						
Meyer & Brown, Inc.	[7]63,200	....	13,800	....	[8]24,700	101,700
Fred Stern & Co.	....	....	[9]22,342	....	....	22,342
Alden's Successors, Inc.	7,496	6,912	6,225	....	....	20,638
[10]F. R. Henderson & Co.	....	15	272	98	[10a]838	111,600
[10]H. A. Astlett & Co.	1,354	230	525	2,423	....	1,365,795
[10]Gaston, Williams & Wigmore	458	27	115	33	......	271,367
[10]General Rubber Co.	586	75	236	291	....	444,500
[10]Poel & Kelly	275	58	130	12	....	164,680
[10]Raw Products Co.	66	......	....	....	....	232,166
[10]G. Amsinck & Co., Inc.	23	2	....	163	....	62,306
Wm. Schall & Co.	[11]476	....	....	....	....	519,618
[10]Hagemeyer & Brunn	306	....	....	....	....	114,444
[10]Commercial Bank of Spanish America	1	40	7	10	....	25,632
September 17. By the S. S. *Manco*, from Manáos and Pará.						
[10]H. A. Astlett & Co.	218	112	1,164	858	....	734,153
[13]General Rubber Co.	....	....	42	....	....	22,000
[10]Paul Bertuch	163	134	230	....	....	774,227
[10]G. Amsinck & Co., Inc.	296	....	....	....	....	128,788
[10]Poel & Kelly	337	254	120	260	....	159,289
[10]Winter, Ross & Co.	....	....	4	121	....	3,914
[10]E. T. Greiner	93	55	40	20	....	69,095
[10]Hagemeyer & Brunn	307	....	1	1	....	114,600

[1]Including 1 case, coarse and fine.
[2]Cametá.
[3]Packages.
[4]Bales.
[5]Including cases, bags and bales.
[6]Cases and bales.
[7]Fine and medium.
[8]Cametá.
[9]Islands coarse.
[10]Cases.
[10a]Packages weighing 41,160 lbs.
[11]Packages.

PLANTATIONS.

(Figured 180 pounds net to the bale or case.)

	Shipment from:	Shipped to:	Pounds.	Totals.
August 19. By the S. S. *Arabia Maru*, at Tacoma.[12]				
F. R. Henderson & Co.	Singapore	New York	255,420	
Thos. A. Desmond & Co.	Singapore	New York	44,820	
				300,240

[12] Ex. *Osaka Shosen Kaiska*, from Yokohama.

	Shipment from:	Shipped to:	Pounds.	Totals.
August 21. By the S. S. *Anglo Chilean*, at New York.				
R. F. Downing & Co.	London	New York	81,180	
Vernon Metal & Produce Co.	London	New York	43,200	
				124,380
August 1. By the S. S. *Niagara*, at New York.				
A. Salomon, Inc.	Bordeaux	New York	239,040	
Rubber Importers & Dealers Co.	Bordeaux	New York	180,360	
A. D. Straus & Co., Inc.	Bordeaux	New York	72,680	
				492,080
August 25. By the S. S. *Stanley Dollar*, at San Francisco.				
The B. F. Goodrich Co.	Singapore	San Francisco	578,160	
J. T. Johnstone & Co., Inc.	Batavia	San Francisco	344,960	
Rubber Trading Co.	Singapore	San Francisco	100,800	
McAllister Bros.	Singapore	San Francisco	94,500	
L. Littlejohn & Co., Inc.	Singapore	San Francisco	112,000	
Winter, Ross & Co.	Batavia	San Francisco	69,160	
F. R. Henderson & Co.	Batavia	San Francisco	76,140	
The Goodyear Tire & Rubber Co.	Batavia	San Francisco	58,680	
Francis Peek & Co., Ltd.	Batavia	San Francisco	44,280	
				1,578,680
August 25. By the S. S. *Empress of Asia*, via Hongkong at Vancouver.				
F. R. Henderson & Co.	Singapore	Vancouver	209,340	
Federal Export Corp.	Singapore	Vancouver	126,540	
Adolph Hirsch & Co.	Singapore	Vancouver	41,040	
				376,920
August 30. By S. S. *Bloemfontein*, at New York.				
Curry, McPhillips & Co.	Hull	New York	26,460	26,460
September 1. By the S. S. *Nazarine*, at New York.				
F. R. Downing & Co.	London	New York	57,600	
L. Littlejohn & Co., Inc.	London	New York	10,260	
Various	London	New York	2,700	
				70,560
September 1. By the S. S. *Swazi*, at New York.				
Meyer & Brown, Inc.	London	New York	3,586,680	
L. Littlejohn & Co., Inc.	Colombo	New York	305,475	
Poel & Kelly	Calcutta	New York	5,800	
				3,897,955
September 2. By the S. S. *Siberia* Maru, at San Francisco.[13]				
Bowers Rubber Works	Singapore	San Francisco	9,720	9,720

[13] Ex. S. S. *Hiayang*, via Singapore.

	Shipment from:	Shipped to:	Pounds.	Totals.
September 3. By the S. S. *Suwa Maru*, at Seattle.[14]				
The Goodyear Tire & Rubber Co.	Singapore	Akron	28,800	
Various	Singapore	Seattle	9,000	
				37,800

[14] Ex. *Nippon Yusen Kaisha*, steamer from Yokohama.

	Shipment from:	Shipped to:	Pounds.	Totals.
September 5. By the S. S. *Edgemont*, at New York.				
Adolph Hirsch & Co.	London	New York	12,240	12,240
September 8. By the S. S. *Euryades*, at New York.				
J. T. Johnstone & Co., Inc.	Deli	New York	529,760	
J. T. Johnstone & Co., Inc.	Singapore	New York	27,720	
William H. Stiles & Co.	Singapore	New York	64,440	
William H. Stiles & Co.	Port Dickson	New York	20,520	
L. Littlejohn & Co., Inc.	Singapore	New York	2,240,000	
Hadden & Co.	Singapore	New York	244,080	
Hadden & Co.	Deli	New York	17,280	
Poel & Kelly	Singapore	New York	230,040	
Poel & Kelly	Port Dickson	New York	25,200	
Poel & Kelly	Port Swett'ham	New York	6,120	
Poel & Kelly	Penang	New York	1,800	
Edward Maurer Co., Inc.	Singapore	New York	161,280	
A. C. Harper & Co.	Port Swett'ham	New York	158,760	
Thos. A. Desmond & Co.	Singapore	New York	103,320	
Winter, Ross & Co.	Deli	New York	103,140	
Winter, Ross & Co.	Singapore	New York	54,720	
Winter, Ross & Co.	Tuluk Anson	New York	6,120	
United Malaysian Rubber Co., Ltd.	Singapore	New York	100,800	
Mexican Crude Rubber Co.	Port Swett'ham	New York	72,000	
H. R. Jeffords	Port Swett'ham	New York	2,520	
Fred. Stern & Co.	Singapore	New York	56,000	
Various	Singapore	New York	86,240	
				4,326,980
September 11. Ex. S. S. *Hong Bee*, at San Francisco.[15]				
Thos. A. Desmond	Hongkong	New York	71,640	
Charles T. Wilson Co., Inc.	Hongkong	San Francisco	40,320	
				111,960

[15] Ex. S. S. *Shinyo Maru*, from Hongkong.

	Shipment from:	Shipped to:	Pounds.	Totals.
September 12. By the S. S. *Colombia*, at San Francisco.				
Thos. A. Desmond & Co.	Hongkong	New York	44,820	
Fred Stern & Co.	Singapore	San Francisco	112,050	
				156,870
Sept. 15. By the S. S. *Harlem*, at New York.				
Various	Bordeaux	New York	2,880	2,880
September 15. By the S. S. *Aquitania*, at New York.				
Poel & Kelly	Southampton	New York	123,200	123,200
September 15. By the *City of Shanghai*, at New York.				
L. Littlejohn & Co., Inc.	Colombo	New York	102,060	
J. T. Johnstone & Co., Inc.	Colombo	New York	82,240	
Various	Colombo	New York	11,880	
				196,180
September 16. By the S. S. *Cretic*, at New York.				
Rubber Trading Co.	Liverpool	New York	720	
Fred. Stern & Co.	Liverpool	New York	24,600	
Curry, McPhillips & Co.	Liverpool	New York	107,360	
				132,680

	Shipped from:	Shipped to:	Pounds.	Totals.
Sept. 16. By S. S. *Orduna*, at New York.				
Poel & Kelly..........	Liverpool	New York	250,880	
General Rubber Co......	Liverpool	New York	39,600	
Meyer & Brown, Inc....	Liverpool	New York	11,200	
L. Littlejohn & Co., Inc.	Liverpool	New York	1,620	303,300
Sept. 16. By the S. S. *Minnehaha*, at New York.				
The Goodyear Tire & Rubber Co.	London	New York	94,840	
Various	London	New York	43,200	138,040
Sept. 16. By the S. S. *Tan Overstraten*, at New York.				
General Rubber Co.....	Asahan	New York	1,847,520	
J. T. Johnstone & Co., Inc.	Belawan	New York	39,100	
Aldens' Successors, Inc.	Belawan	New York	33,415	
The Goodyear Tire & Rubber Co.	Medan	Akron	295,380	
G. Amsinck & Co., Inc..	Belawan	New York	219,600	
Poel & Kelly...........	Belawan	New York	105,280	
Peninsular Trading Co..	Asahan	New York	93,240	
Peninsular Trading Co..	Belawan	New York	22,800	
Gaston, Williams & Wigmore	Belawan	New York	68,760	
Pablo Homs............	Belawan	New York	55,440	
L. Littlejohn & Co......	Belawan	New York	33,600	2,814,135

BALATA.

	Shipped from:	Shipped to:	Pounds.	Totals.
Aug. 21. By the S. S. *Advance*, at New York.				
G. Amsinck & Co., Inc..	Cristobal	New York	4,350	
Holtrane Co., Inc......	Cristobal	New York	2,700	7,050
Aug. 27. By the S. S. *Oranje Nassau*, at New York.				
Middleton & Co........	Paramaribo	New York	11,550	
Wm. Schall & Co........	Paramaribo	New York	7,200	
Willard Hawes & Co....	Paramaribo	New York	1,500	20,250
Aug. 27. By the S. S. *W. K. Tupker*, at New York.				
Sorenson & Nielson.....	Colon	New York	600	
Meeke & Co............	Colon	New York	300	900
Sept. 5. By the S. S. *Gen. O. H. Ernst*, at New York.				
G. Amsinck & Co., Inc..	Cristobal	New York	17,550	
Pablo, Calvet & Co.....	Cristobal	New York	4,800	
Antioquia Comm's corp..	Cristobal	New York	3,000	
Neuss, Hesslein & Co...	Cristobal	New York	1,350	26,700

	Shipped from:	Shipped to:	Pounds.	Totals.
Sept 6. By the S. S. *Prins der Nederlanden*, at New York.				
Middleton & Co........	Saint Marc	New York	6,600	6,600
Sept. 8. By the S. S. *Mara[illegible]*, at New York.				
South & Central American Comm'l Co.	Grenda	New York	12,360	12,360
Sept. 15. By the S. S. *Colon*, at New York.				
G. Amsinck & Co., Inc..	Cristobal	New York	8,400	
American Trading Co. ..	Cristobal	New York	6,900	
W. Reed. Williams, Inc.	Cristobal	New York	3,300	
Fidanque Bros. & Sons..	Cristobal	New York	1,800	
Cook & Bernheimer Co..	Cristobal	New York	1,200	
Piza, Nephews & Co....	Cristobal	New York	450	22,050

CENTRALS.

	Shipped from:	Shipped to:	Pounds.	Totals.
Aug. 21. By the S. S. *Stavangeren*, at New York.				
Southern Sales corporation	Ciudad Bolivar	New York	27,100	27,100
Aug. 21. By the S. S. *Advance*, at New York.				
Pablo, Calvet & Co.....	Cristobal	New York	11,900	
Gaston, Williams & Wigmore	Cristobal	New York	10,200	
T. S. Sembrada & Co...	Cristobal	New York	7,700	
American Trading Co..	Cristobal	New York	7,600	
G. Amsinck & Co., Inc..	Cristobal	New York	6,800	
W. R. Grace & Co......	Cristobal	New York	3,100	
A. M. Capens' Sons....	Cristobal	New York	2,500	49,800
Aug. 25. By the S. S. Lulu, at New York.				
R. Desvernine	Venezuela	New York	100	100
Aug. 29. By the S. S. *Lake Wilson*, at New York.				
Thos. A. Crane's Sons..	Cristobal	New York	3,800	
J. S. Sembrada & Co....	Cristobal	New York	1,700	5,500
Sept. 1. By the S. S. *Mohegan*, at New York.				
Sorenson & Nielsen.....	Cartagena	New York	3,000	
American Trading Co...	Cartagena	New York	1,900	4,900
Sept. 5. By the S. S. *Charlton Hall*, at New York.				
David L. Moss & Co....	Montevideo	New York	10,200	10,200
Sept. 5. By the S. S. *Gen. H. F. Hodges*, at New York.				
G. Amsinck & Co., Inc...	Cristobal	New York	4,600	
Various	Cristobal	New York	100	4,700

(*Continued on page 62.*)

EXPORTS OF INDIA RUBBER FROM MANAOS DURING THE MONTH OF JULY, 1919.

	New York.					Europe.					
Exporters.	Fine.	Medium.	Coarse.	Caucho.	Totals.	Fine.	Medium.	Coarse.	Caucho.	Totals.	Grand Totals.
General Rubber Co. of Brazil *kilos*	......	......	......	......	......	89,440	10,560	......	......	100,000	100,000
Tancredo, Porto & Co..........	33,846	3,628	4,779	9,747	52,000	26.989	......	2,411	11,600	41,000	93,000
T. G. Araujo....................	......	......	......	......	......	57,784	......	2,288	......	60,072	60,072
Higson & Fall	......	......	......	......	......	17,877	1,599	484	......	19,949	19,949
A. Souza	3,358	419	288	15,660	19,725	......	......	......	......	......	19,725
Chase Import & Export Corporation	16,577	1,130	1,153	......	18,860	......	......	......	......	......	18,860
B. Lévy & Co....................	......	......	......	......	......	2,045	177	7,560	3.420	13,202	13,202
Stowell & Co....................	......	......	4,070	......	4,070	......	......	3.656	......	3,656	7.726
Armazens Andresen	......	......	......	......	......	996	3,267	1,011	1,124	6,398	6,398
F. Salles Vieira	1,094	26	600	300	2,020	......	......	......	......	......	2.020
Total, Manáos	54,875	5,203	10,890	25,707	96,675	195,131	15,592	17,410	16,144	244,277	340,952
In transit, Iquitos	1,528	13,629	17,907	19,390	52,454	1.413	6,268	1,728	17,429	26,838	79,292
Totals	56,403	18,832	28,797	45,097	149,129	196,544	21,860	19.138	33,573	271,115	420,244

(*Compiled by Stowell & Co., Manáos, Brazil.*)

EXPORTS OF INDIA RUBBER FROM PARA, MANAOS AND IQUITOS DURING THE MONTH OF AUGUST, 1919.

	To New York.					To Europe.					
Exporters	Fine.	Medium.	Coarse.	Caucho.	Totals.	Fine.	Medium.	Coarse.	Caucho.	Totals.	Grand Totals.
Stowell & Co.............*kilos*	5.798	3,447	25,959	1,817	37,021	109,591	3,180	3,168	....	115,939	152,960
Saurez Filho & Co............	26,292	....	9,564	75,483	118,339	19,408	......	......	20,321	39,729	151.068
General Rubber Co............	34,170	2,506	31,499	30,319	93,494	1,775	75	77	30,462	32,389	130,883
Alfredo Valhe & Co...........	11,900	1,766	....	....	13,666	17,154	......	12,068	30,190	59,412	73,078
Bitar Irmãos..................	1.280	480	160	44,320	46.240	....	....	......	20.800	20,800	67.040
T. Chamié	20,400	....	15,120	15,000	50,520	......	....	......	....	....	50.520
J. Marques	16,320	....	23,760	....	40,080	......	....	......	....	....	40,080
Berringer & Co................	20,577	2,072	1,487	964	25,100	......	....	......	....	.....	25,100
Ad. H. Alden, Ltd.............	....	....	....	....	......	......	......	......	13,198	13,198	13,198
Ferreira, Costa & Co..........	6,800	510	....	....	7,310	......	......	......	....	....	7.310
C. Zencovich	....	....	....	....	......	5,440	....	......	....	5,440	5,440
Sundries	34.935	958	14,521	33,149	83,563	34,665	4.166	2,612	7,710	49,153	132,716
From Pará	178.472	11,739	122,070	201,052	513,333	188,033	7,421	17,925	122,681	336,060	849,393
From Manáos................	462,654	88,869	170,133	248,939	970,595	472,813	47,490	11,612	40,898	572,813	1,543,408
From Iquitos	....	....	....	....	....	11,535	....	1,388	64,017	76,940	76,940
Totals	641,126	100,608	292,203	449,991	1,483,928	672,381	54,911	30,925	227,596	985,813	2,469,741

(*Compiled by Stowell & Co., Pard, Brazil.*)

	Shipped from:	Shipped to:	Pounds.	Totals.
Sept. 5. By the S. S. *Gen. O. H. Ernst*, at New York				
J. S. Sembrada & Co....	Cristobal	New York	15,300	
Pablo, Calvet & Co....	Cristobal	New York	3,900	
Balfour, Williamson & Co.	Cristobal	New York	2,400	
Various	Cristobal	New York	1,400	23,000
Sept 11. By the S. S. *Tredues*, at New York.				
Sorenson & Nielsen.....	Cartagena	New York	3,500	3,500
Sept. 15. By the S. S. *Colon*, at New York.				
Fiza, Nephews & Co....	Cristobal	New York	6,900	
Fidanque Bros. & Sons..	Cristobal	New York	1,600	8,500
Sept. 16. By the S. S. *Caracas*, at New York.				
Commercial Bank of Spanish America.....	Carácas	New York	4,200	4,200
Sept. 17. By the S. S. *Alamo*, at New York.				
Andean Trading Co....	Cartagena	New York	5,300	
Commercial Bank of Spanish America.....	Cartagena	New York	700	6,000
Sept. 17. By the S. S. *Zecapa*, at New York.				
Isaac Brandon & Bros..	Cristobal	New York	200	200
Sept. 15. By the S. S. *Morro Castle*, at New York.				
General Exp. of Comm. Co.	Tampico	New York	1,000	
Faman & Kemp........	Tampico	New York	6,500	7,500

MANICOBAS.

Sept. 11. By the S. S. *Opequan*, at New York.				
T. Blumenthal Co.......	Bakia	New York	180,400	180,400

PONTIANAK.

Sept. 8. By the S. S. *Euryades*, at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	242,700	
United Malaysian Rubber Co., Ltd.........	Singapore	New York	209,100	
Sukuki & Co...........	Singapore	New York	166,800	
Edward Boustead & Co..	Singapore	New York	129,300	
East Asiatic Co........	Singapore	New York	125,400	
Yaeger & Co., Ltd......	Singapore	New York	118,500	
Fred Stern & Co......	Singapore	New York	15,680	1,007,480

AFRICANS.

Sept. 4. By the S. S. *Gothland*, at New York.				
Curry, McPhillips & Co..	Antwerp	New York	3,880	3,880
Sept. 15. By the S. S. *Harlem*, at New York.				
Rubber Importers & Dealers Co.	Bordeaux	New York	151,110	151,110
Sept. 17. By the S. S. *Thonga*, at New York.				
Niger Company, Ltd....	Sierre Leone	New York	54,970[1]	54,970

[1] Water flake.

GUAYULE.

Aug. 27. By rail to Eagle Pass.				
Continental Mexican Rubber Co.	Torreon	Akron, Ohio	78,150	78,150

RUBBER STATISTICS FOR THE DOMINION OF CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	June.			
	1918.		1919.	
	Pounds.	Value.	Pounds.	Value.
Unmanufactured—*free:*				
Rubber, gutta percha, etc.:				
From United Kingdom	22,909	$14,036	140,165	$62,953
United States	836,107	406,773	442,023	195,618
British East Indies:				
Ceylon	383,360	178,117	45,472	42,630
India	....	....	....	....
Straits Settlements..	734,013	314,001	398,561	188,084
Other countries . .	....	....	....	....
Totals	1,976,389	$942,932	1,026,221	$489,235
Rubber, recovered	172,166	31,453	211,019	38,417
Hard rubber sheets and rods..	2,605	2,053	35,695	6,674
Hard rubber tubes...........	....	536	....	1,437
Rubber, powdered, and rubber or gutta percha scrap......	341,621	28,192	124,287	18,963
Rubber thread, not covered..	3,795	5,521	1,001	1,474
Rubber substitute	107,419	11,182	100,228	6,984
Totals	1,976,389	$942,932	1,026,221	$489,235
Chicle	166,574	$106,818	183,039	$137,202
Manufactured—*dutiable:*				
Boots and shoes...	....	$11,979	....	$16,770
Waterproofed clothing	....	11,611	....	20,624
Belting, hose and packing....	....	46,164	....	23,590
Gloves and hot-water bottles..	....	(1)	....	2,297
Tires	....	149,592	....	140,406
Other manufactures	....	157,531	....	168,904
Totals	....	$376,877	....	$372,591

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	June.			
	1918.		1919.	
	Produce of Canada. Value.	Re-exports of Foreign Goods. Value.	Produce of Canada. Value.	Re-exports of Foreign Goods. Value.
Unmanufactured—				
Crude and waste rubber...	......	......	......	$6,835
Manufactured—				
Hose	$13,175	......	$1,695	......
Boots and shoes..........	76,653	......	45,846	839
Clothing	201	......	10,570	......
Tires	37,759	331	396,583	5,731
Waste	1,604	......	27,908	......
Belting	232	......	997	......
All other—n. o. p........	5,774	15,983	15,720	2,657
	$135,398	$16,314	$499,319	$16,062
Chicle	145,769	......	73,737	......

[1] Included in "Other manufactures."

UNITED KINGDOM RUBBER STATISTICS.

IMPORTS.

	July.			
	1918.		1919.	
	Pounds.	Value.	Pounds.	Value.
Unmanufactured—				
Crude rubber:				
From -				
Dutch East Indies......	23,400	£2,513	2,956,800	£292,490
French West Africa.....	......	......	......	......
Gold Coast	177,200	9,116	32,600	3,048
Other African countries..	1,103,700	113,919	97,100	8,894
Peru	......	......	137,300	14,800
Brazil	33,600	4,200	291,900	36,336
British India	431,900	48,042	161,800	15,550
Straits Settlements and dependencies, including Labuan	2,947,100	325,634	3,864,900	375,381
Federated Malay States..	2,375,800	278,003	4,660,100	434,701
Ceylon and dependencies.	1,574,100	181,945	1,749,900	167,026
Other countries	1,300	170	539,300	51,791
Totals	8,668,100	£963,542	14,491,700	£1,400,017
Waste and reclaimed rubber.	2,200	25	611,200	16,480
Totals, unmanufactured	8,670,300	£963,567	15,102,900	£1,416,497
Gutta percha	453,800	£73,748	208,800	£34,692
Manufactured—				
Boots and shoes..*dozen pairs*	211	£2,435	9,412	£17,221
Waterproofed clothing.....	......	......	......	650
Automobile tires and tubes.	......	57,529	......	255,167
Motorcycle tires and tubes.	......	......	......	1,865
Bicycle tires and tubes....	......	1,510	......	2,948
Carriage tires and tubes..	......	......	......	274
Insulated wire	......	......	......	558
Totals	211	£61,469	9,412	£278,683

EXPORTS.

Unmanufactured—				
Waste and reclaimed rubber	782,800	£17,747	1,192,400	£31,650
Manufactured—				
Waterproof clothing.......	......	40,762	......	117,824
Boots and shoes..*dozen pairs*	41.916	215,678	46,884	340,926
Insulated wire	......	4,113	......	88,752
Submarine cables..........	......	23,300	......	107,265
Carriage tires and tubes....	......	12,770	......	17,016
Automobile tires and tubes.	......	92,326	......	166,034
Motorcycle tires and tubes.	......	31,035	......	11,890
Bicycle tires and tubes.....	......	18,515	......	119,418
Other rubber manufactures.	......	124,558	......	214,955
Totals	......	£580,804	......	£1,215,430

EXPORTS—COLONIAL AND FOREIGN.

Unmanufactured—				
Crude rubber:				
To Belgium	......	......	772,600	£61,244
France	1,452,200	£157,020	763,700	71,576
Italy	649,300	69,563	408,200	35,412
Russia	......	......	22,400	3,500
United States	46,700	4,000	1,046,200	78,449
Other countries......	310,800	35,630	1,856,700	190,081
Totals	2,459,000	£266,213	4,869,800	£446,262
Waste and reclaimed rubber.	......	......	......	......
Gutta percha	27,400	3,093	170,200	24,868
Manufactured—				
Boots and shoes..*dozen pairs*	......	......	......	......
Insulated wire	......	£97	......	......
Automobile tires and tubes.	......	3,338	......	£7,740
Motorcycle tires and tubes.	......	50	......	1,498
Bicycle tires and tubes....	......	1,028	......	8
Carriage tires and tubes....	......	98	......	19
Totals	......	£4,606	......	£8,264

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES, DURING THE MONTH OF JULY, 1919.

EXPORTED TO	Belting Hose and Packing. Value.	Boots. Pairs.	Boots. Value.	Shoes. Pairs.	Shoes. Value.	Druggists' Rubber Sundries Value.	Tires. Automobile. Value.	Tires. All Others. Value.	Insulated Wire and Cable. Value.	All Other Rubber Manufactures. Value.	Totals. Value.
EUROPE:											
Austria-Hungary						$9				$17	[illegible]
Belgium		62	$132			[illegible]	[illegible]		$8,909	1,929	40,669
Denmark	$4,931	2,704	5,015	2,640	[illegible]	[illegible]	[illegible]	[illegible]	6,445	9,925	131,273
Finland	5,962										5,962
France	8,890					[illegible]	[illegible]		8,398	60,779	191,296
Gibraltar				1,320	1,230		175				1,405
Greece		1	5				542		3,176	529	4,252
Iceland and Faroe Islands	387	1,241	3,644	8,912	[illegible]	116	1,093		98	2,516	15,137
Italy				9,528	6,514		55,808		489	1,679	64,290
Netherlands	18,199					2,091	27,586		71,388	2,273	121,537
Norway	6,600	1,018	1,864	18,240	11,836	486	54,730	1,898	224,233	9,651	311,292
Portugal							565	2,520	981	150	4,216
Spain	4,849					5	14,008		1,749	1,691	22,302
Sweden	60,026			528	466	1,113	150,970		2,541	8,560	223,676
Switzerland						2				140	142
England	13,986	228	409	8,326	[illegible]	[illegible]	102,453	5,600	12,831	95,048	243,215
Scotland							150				150
TOTALS, EUROPE	$123,830	5,254	$11,069	49,494	$34,291	[illegible]	$648,708	$11,388	$341,238	$194,887	$1,380,840
NORTH AMERICA:											
Bermuda	$129	12	$33			$1	$50			$5	[illegible]
British Honduras	129			1,260	$1,332	14	2,374	$3		50	3,902
Canada	32,537	1,493	5,441	3,219	3,081	14,381	78,192	3,157	$10,427	136,418	283,634
Costa Rica	139					65	1,190	138	142	15	1,689
Guatemala	439			720	827		40			210	1,516
Honduras	244			354	360	175	5,762	121	1,579	129	8,396
Nicaragua	802					176	3,353	87	6	2,051	6,475
Panama	7,079			1,935	1,546	454	44,184	1,828	22,311	2,187	79,589
Salvador						[illegible]	[illegible]	2	1,049	5,160	16,133
Mexico	65,944	38	142	2,174	1,966	[illegible]	42,643	3,751	23,126	19,364	164,887
Miquelon, Langley, etc.		1,524	4,981					6			4,987
Newfoundland and Labrador	769	4,022	10,944	5,263	5,183		2,125	39	2,503	2,281	23,844
Barbados		24	33	96	76	72	1,272		50	145	1,648
Jamaica	1,547			418	480	139	5,899		127	616	8,808
Trinidad and Tobago	382						3,044		527	232	4,235
Other British West Indies	57			485	354		239			6	656
Cuba	26,187	4	20	6,627	4,655	4,027	102,807	3,660	39,634	12,177	193,167
Danish West Indies						71	2,082			37	2,190
Dutch West Indies							240		187	5	432
French West Indies	347						4,907	27		92	5,373
Haiti	215			60	58		1,394	42	136	329	2,174
Dominican Republic	460					800	5,554	296	1,188	1,655	9,955
TOTALS, NORTH AMERICA	$137,406	7,177	$21,594	22,611	$19,964	$28,583	$317,046	$13,157	$102,992	$183,164	$823,906
SOUTH AMERICA:											
Argentina	$4,251			24	$24	$9,435	$130,961		$19,456	$10,337	$174,464
Bolivia	710						353	232	186	94	1,375
Brazil	17,345			11,738	10,043	6,361	[illegible]	267	75,408	7,088	191,536
Chile	14,758			600	636	4,350	[illegible]	8,340	19,462	9,519	71,360
Colombia	2,346					604	3,741		4,093	1,456	12,240
Ecuador	853	36	$126	1,242	[illegible]	33	2,695		552	62	5,615
British Guiana	3						1,860		577	576	3,016
Paraguay	163										163
Peru	8,497					73	21,354	46	4,620	1,406	35,996
Uruguay	2,305	525	507	3,024	1,962	2,123	51,484		18,417	5,650	82,448
Venezuela	2,767					2,064	12,291	61	916	1,701	19,800
TOTALS, SOUTH AMERICA	$53,998	561	$633	16,628	$13,961	$25,043	$314,056	$8,746	$143,687	$37,889	$598,013
ASIA:											
China	$6,538	13	$46	223	$265	$956	$18,079	$301	$995	$8,630	$35,780
Chosen	1,568										1,566
British India	1,237			186	[illegible]	1,165	2,252		14,710	2,239	21,732
Straits Settlements						27	20,066		254	1,146	21,493
Other British East Indies							4,270			9	4,279
Dutch East Indies	2,903						69,933	2,388	22,666	3,009	100,899
French East Indies										14	14
Hongkong	4,478	180	530	60	47		1,049		198	82	6,384
Japan	223	264	647	5,360	4,865		608			382	6,723
Russia in Asia	572	5,901	22,210	20,149	23,878	343	1,042			1,201	47,246
Siam	625					57	405				1,087
TOTALS, ASIA	$18,144	6,358	$21,433	25,978	$29,152	$2,548	$117,704	$2,689	$38,823	$16,712	$247,205
OCEANIA:											
Australia	$18,593			8,177	$6,047	[illegible]	[illegible]	[illegible]	$6,766	$7,036	$92,079
New Zealand	917	897	$3,898			[illegible]	[illegible]	119	4,080	9,983	66,973
Other British Oceania							50	155		15	220
French Oceania	100						1,127	340		160	1,727
German Oceania							522	122		6	650
Philippine Islands	12,633			5,359	[illegible]	2,176	47,290	1,686	21,385	16,578	109,607
TOTALS, OCEANIA	$32,243	897	$3,898	13,536	[illegible]	$2,968	$149,601	$2,631	$32,231	$33,778	$271,256
AFRICA:											
British West Africa	$1,432						$11,064	$35			$12,531
British South Africa	30,044	208	$779	3,165	$3,162	[illegible]	11,366		$247	$7,582	53,563
British East Africa										200	200
Canary Islands							500				500
French Africa	620	1	3					120	375		1,118
German Africa						5				12	17
Liberia						14	32			3	49
Portuguese Africa	2,660									104	2,764
TOTALS, AFRICA	$34,756	209	$782	3,165	$3,162	$162	[illegible]	$155	$922	$7,901	$70,742
TOTALS	$400,377	20,396	$59,409	131,412	$114,436	$74,733	$1,570,017	$38,766	$659,893	$474,331	$3,301,062

SHIPMENTS TO NON-CONTIGUOUS TERRITORY.

	Belting Hose and Packing. Value.	Boots. Pairs.	Boots. Value.	Shoes. Pairs.	Shoes. Value.	Druggists' Rubber Sundries Value.	Tires. Automobile. Value.	Tires. All Others. Value.	Insulated Wire and Cable. Value.	All Other Rubber Manufactures. Value.	Totals. Value.
Hawaii	$6,740						$43,811	$1,841		$11,333	
Porto Rico	3,761						132,865	1,348		21,754	
TOTALS	$10,501						$176,676	$3,189		$33,087	[illegible]

(*Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.*)

THE MARKET FOR RUBBER SCRAP.

NEW YORK.

Dealings in scrap rubber for the month passed has been without activity or notable incident. There is no foreign movement of scrap either import or export.

Market conditions have not met the anticipations of the dealers as regards revival of the trade. The upward tendency of crude rubber has had no effect upon either the scrap or the reclaimed rubber markets.

Boots and Shoes.—The demand has been intermittent and prices steady.

Tires.—Buying demand has been fair, mostly for picking purposes. Prices have been steady and firm for good stock.

Inner Tubes.—The situation continues without interest.

QUOTATIONS FOR CARLOAD LOTS DELIVERED.

September 25, 1919.

Prices subject to change without notice.

BOOTS AND SHOES:				
Arctic tops	lb.	.01	@	
Boots and shoes	lb.	.08¾	@	
Trimmed arctics	lb.	.06½	@	.06⅝
Untrimmed arctics	lb.	.05⅝	@	
HARD RUBBER:				
Battery jars, black compound	lb.	.01	@	
No. 1, bright fracture	lb.	.23	@	.24
INNER TUBES:				
No. 1, old packing	lb.	.19	@	.20
No 2	lb.	.10½	@	.10¾
Red	lb.	.10	@	.10½
MECHANICALS:				
Black scrap, mixed, No. 1	lb.	.03½	@	.04
No. 2	lb.	.03	@	
Car springs	lb.	.03½	@	.04
Heels	lb.	.03	@	.03½
Horse-shoe pads	lb.	.03	@	.03½
Hose, air brake	lb.	.04¼	@	
fire, cotton lined	lb.	.01½	@	.01¾
garden	lb.	.01½	@	.01¾
Insulated wire stripping, free from fiber	lb.	.03½	@	.04
Matting	lb.	.01¼	@	.01½
Red packing	lb.	.05½	@	.06
Red scrap, No. 1	lb.	.09	@	.10
No. 2	lb.	.06¾	@	.07¼
White scrap, No. 1	lb.	.10	@	.11
No. 2	lb.	.08	@	.09
TIRES:				
PNEUMATIC—				
Auto peelings, No. 1	lb.	.07	@	.08
No. 2	lb.	.05	@	.05½
Bicycle	lb.	.03	@	.03¼
Standard white auto	lb.	.04¾	@	.05
Standard mixed auto	lb.	.04	@	
Stripped, unguaranteed	lb.	.03	@	
White, G. & G., M. & W., and U. S.	lb.	.05	@	.05¼
SOLID—				
Carriage	lb.	.04	@	.04¼
Irony	lb.	.01	@	
Truck	lb.	.03⅞	@	.04⅛

THE MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

In the first week of September there was a sharp decline in middling spot cotton from 32.05 cents to 28.85 cents, the lowest point it reached. It hovered around 29 cents for another week, then rose to a week's variations around 30 cents, and in the last week of the month rose sharply to 31.60 cents.

The Government's estimate of the crop, which in August was 11,640,000 round bales, fell to 11,230,000 round bales in September and conservative observers expect it to fall below the 11,000,000 mark in the next report, owing to the prevailing wet weather and the ravages of insect pests, making the fifth consecutive year of short crops.

The market is very firm, the strong demand coming not only from Americans but also from Japanese and English buyers, the latter having to make up in some way the deficiency in Egyptian cotton. If Germany can obtain the necessary credits, it is predicted that the price of cotton will rise at once to 40 cents.

Egyptian Cotton. Although obtainable, it is difficult to get because the American buyer must contend with the English and Continental competition, for England must have long-staple cotton if the mills that make many of her staple fabrics are to reopen. This year's crop of Egyptian is estimated at 6,250,000 cantars or 860,000 bales of 720 pounds each and the latest reports are favorable, the boll worm having done less damage than usual. The yield of Sakellaridis and of upper Egyptian is expected to be about 20 per cent above the average and the same holds good for Afifi. Several cargoes of Egyptian cotton have arrived lately in this country. The prices quoted are for Sakellaridis, low grade 52 cents, medium grade 57 cents, high grade 63 cents; for upper Egyptian, low grade 49 cents, medium grade 51 cents, high grade 53 cents.

Sea Island Cotton. Manufacturers have been forced to throw this out of account, practically, owing to the disasters to the crop. In three consecutive years the crop had dropped to nearly one-half of the normal quantity; this year it has shriveled to probably less than 20,000 bales. Manufacturers have been forced to turn elsewhere for their long-staple cotton, and have found some relief from Egypt, from Arizona and from Peru.

American Egyptian. The Arizona cotton, while it will not make up for the shortage in other long-staple varieties, will be the largest crop yet produced, from 45,000 to 50,000 bales. There was an active demand for Pima cotton when dealings in the new crop began; for October-December shipments the price for cotton an inch and three-quarters in staple was 67 to 68 cents, with every indication that the mills are substituting it for Sea Island for which a higher price is asked.

Tire Fabrics. The market is very strong, the product of the mills has been sold in many cases for a year ahead and the factories are working to their limit. It is estimated that the output of tires for the coming year will be between 35,000,000 and 40,000,000. The manufacturers are hampered by the shortage in long-staple cotton and many object to using peelers as a substitute.

Other Fabrics. The market for belting and hose is quiet. There is an improved demand for lighter ducks and drills, particularly 46 inches and wider; the manufacturers of rubber goods show more concern about securing supplies than about the price. There is a very strong demand for sheetings which are sold practically to the end of 1920; the same holds good for carriage cloth. There is little demand for Osnaburgs or for general cotton goods, but the tone of the market is better than it was a month ago.

NEW YORK QUOTATIONS.

September 25, 1819.

Prices subject to change without notice.

ASBESTOS CLOTH:			
Brake lining, 2½ lbs. sq. yd., brass or copper insertion	lb	.85	@
2¼ lbs. sq. yd., brass or copper insertion	lb.	.90	@
BURLAPS:			
32—7-ounce	100 yards	12.50	@
32—8-ounce		13.50	@
40—7½-ounce		14.15	@
40—8-ounce		14.25	@

BURLAPS:

40—10-ounce . . . . . 100 yards	18.00	@
40—10½-ounce	18.25	@
45—7½-ounce	[illegible]	@
45—8-ounce	17.00	@
45—[illegible]-ounce	None	
48—10-ounce	20.00	@

DRILLS:

38-inch 2.00-yard . . . . . yard	[illegible]	@
40-inch 2.47-yard	[illegible]	@
52-inch 1.90-yard	[illegible]	@
52-inch 1.95-yard	46¼	@
60-inch 1.52-yard	.60	@

DUCK:

CARRIAGE CLOTH:

38-inch 2.00-yard enameling duck . . . . . yard	.35½	@
38-inch 1.74-yard	.40½	@
72-inch 16.66 ounce	.88½	@
72-inch 17.21-ounce	[illegible]	@

MECHANICAL:

Hose . . . . . pound	.65	@
Belting	.65	@

HOLLANDS, 40-INCH:

Acme . . . . . yard	.30	@
Endurance	.38	@
Penn	.46	@

OSNABURGS:

40-inch 2.35-yard . . . . . yard	.27⅝	@

OSNABURGS:

40-inch [illegible]-yard . . . . . yard	.26½	@
37½-inch 2.42-yard	[illegible]	@

RAINCOAT FABRICS:

COTTON:

Bombazine 64 x 60 water repellent . . . . . yard	[illegible]	@	
60 x 48 not water repellent	[illegible]	@	
[illegible] cotton and wool, [illegible]	[illegible]	@	
Twills 64 x 72	.4[illegible]	@	
64 x 102	.32	@	
[illegible] 36-inch	[illegible]	@	.45
Tweed	.55	@	.70
printed	.20	@	.25
Plaids [illegible] x 48	.19	@	
56 x 44	.18	@	
Repp	.42	@	.49
Surface prints 60 x 48	.21	@	
64 x 60	.22	@	

IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING —PLAIN AND FANCIES:

63-inch, 3¼ to 7½ ounces . . . . . yard	1.30	@	3.50
36-inch, 2¾ to 5 ounces	.75	@	1.90

IMPORTED PLAID LINING (UNION AND COTTON):

63-inch, 2 to 4 ounces . . . . . yard	.90	@	1.85
36-inch, 2 to 4 ounces	.55	@	1.10

DOMESTIC WORSTED FABRICS:

36-inch, 4½ to 8 ounces . . . . . yard	.65	@	1.20

DOMESTIC WOVEN PLAID LININGS (COTTON):

36-inch, 3¾ to 5 ounces . . . . . yard	.21	@	.32

SHEETINGS:

40-inch, 2.35-yard . . . . . yard	.31½	@
40-inch, 2.50-yard	.29¾	@
40-inch, 2.70-yard	.27¼	@
40-inch, 2.85-yard	.26	@
40-inch, 3.15-yard	.27¼	@
40-inch, 3.60-yard	.23½	@

JACKET:

Delaware . . . . . yard	.30	@
Schuylkill . . . . . yard	.37	@

SILKS:

Canton, 38-inch . . . . . yard	.52½	@
Schappe, 36-inch	.72½	@

TIRE FABRICS:

17¼-ounce Sea Island, combed . . . . . pound	1.45	@
17¼-ounce Egyptian, combed	1.20	@
17¼-ounce Egyptian, carded	*1.12	@
17¼-ounce Peelers, combed	*1.18	@
17¼-ounce Peelers, carded	.95	@

*Nominal.

EGYPTIAN COTTON CROP MOVEMENT.

From August 1 to August 6, 1919.

	1919-1920.	1918-1919.	1917-1918.
To Liverpool . . . . . bales	580	. . . . . .	. . . . . .
Manchester	. . . . . .	2,317	. . . . . .
Total shipments to Great Britain . . .	580	2,317	. . . . . .
To Italy	. . . . . .	. . . . . .	1,171
Total shipments to Continent	. . . . . .	. . . . . .	1,171
To United States	3,751	. . . . . .	. . . . . .
Japan	. . . . . .	2,050	. . . . . .
Total shipments to all parts	4,331	4,367	1,171
Total crop (interior gross weight), cantars[1]	. . . . . .	. . . . . .	6,315,841

[1] A cantar equals 98 pounds.

(*Compiled by Davies, Benachi & Co.*)

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

NEW YORK.

THE PAST MONTH has been characterized by the brisk demand for chemicals and compounding ingredients that was noted for the month previous. The outlook is favorable for a continuation of active business in all lines.

ANILINE OIL.—There is a scarcity in supply of this material and the price is maintained at 28 cents per pound.

BARYTES.—The demand has been very good. Prices are steady at $21 to $21.50 per ton.

BENZOL.—The market is firm and production has been sold in advance at some sources.

DRY COLORS.—The market has improved to a condition of very good demand in standard colors.

LITHARGE.—In common with other lead products consumers' business has been very active.

LITHOPONE.—Despite the brisk demand, some makers are operating at less than full capacity because of scarcity of labor.

MINERAL RUBBER.—Assured business for this staple ingredient has led to an increase of tonnage and brands available and the development of an export trade in the material.

SUBLIMED LEAD.—The same conditions of active consumers demand in this as in other lead products are taxing producers' facilities of output and sustaining firm prices.

WHITING.—There is not an oversupply and prices are steady.

ZINC OXIDE.—The demand and prices remain steady.

NEW YORK QUOTATIONS.

SEPTEMBER 25, 1919.

Subject to change without notice.

ACCELERATORS, ORGANIC.

Accelerator, N. C. C.	lb.	.50	@	
Accelerene	lb.	3.70	@	
Accelemal	lb.	.55	@	
Aldehyde ammonia crystals	lb.	1.00	@	1.25
Aniline oil	lb.	.30	@	
Excellerex	lb.	.85	@	
Hexamethylene tetramine (powdered)	lb.	.93	@	1.05
Paraphenylenediamine	lb.	3.50	@	
Thiocarbanilide	lb.	.50	@	

ACCELERATORS, INORGANIC.

Lead, dry red (bbls.)	lb.	.10¼	@	
sublimed blue (bbls.)	lb.	.08¼	@	
sublimed white (bbls.)	lb.	.08¼	@	
white, basic carbonate (bbls.)	lb.	.09	@	
Lime, flour	lb.	.02	@	
Litharge, domestic	lb.	.09¾	@	
sublimed	lb.	.10	@	
Magnesium, carbonate	lb.	.12½	@	
calcined heavy (Thistle)	lb.	.11	@	
light (Manhattan)	lb.	.35	@	
Magnesium oxide	lb.	.65	@	
Magnesite	lb.	.04	@	

ACIDS.

Acetic, 28 per cent (bbls.)	lb.	.03	@	
glacial, 99 per cent (carboys)	lb.	.12	@	
Cresylic (97% straw color)	gal.	.90	@	
(95% dark)	gal.	.85	@	
Muriatic, 20 degrees	cwt.	1.75	@	2.00
Nitric, 36 degrees	lb.	.06	@	.06½
Sulphuric, 66 degrees	lb.	.02	@	.02¼

ALKALIES.

Caustic soda, 76 per cent (bbls.)	lb.	.04¾	@	
Soda ash (bbls.)	lb.	.03½	@	

COLORS.

Black:				
Bone, powdered	lb.	.05	@	
granulated	lb.	.09	@	
Carbon black (sacks, factory)	lb.	.12	@	
Drop	lb.	.10	@	
Ivory black	lb.	.17	@	
Lampblack	lb.	.16	@	
Oil soluble aniline	lb.	*.40	@	
Rubber black	lb.	.07	@	
Blue:				
Cobalt	lb.	.25	@	.35
Prussian	lb.	.65	@	.75
Ultramarine	lb.	.18	@	.40
Brown:				
Iron oxide	lb.	.04	@	.06
Sienna, Italian, raw and burnt	lb.	.06	@	.12
Umber, Turkey, raw and burnt	lb.	.05½	@	.07
Vandyke	lb.	.02½	@	.03½
Green:				
Chrome, light	lb.	.35	@	.40
medium	lb.	.40	@	.50
dark	lb.	.50	@	.60
commercial	lb.	.07	@	.15
Oxide of chromium (casks)	lb.	.75	@	.85
Red:				
Antimony, crimson, sulphuret of (casks)	lb.	.48	@	
Antimony, golden sulphuret of (casks)	lb.	.24	@	
golden sulphuret (States)	lb.	.28	@	
red sulphuret (States)	lb.	.25	@	
vermilion sulphuret	lb.	.55	@	
Arsenic, red sulphide	lb.	.24	@	
Indian	lb.	.14	@	.16
Toluidine toner	lb.	4.00	@	4.50
Iron oxide, reduced grades	lb.	.14	@	
pure bright	lb.	.16	@	
Spanish	lb.	.04¼	@	.05
Venetian	lb.	.02	@	.04½
Oil soluble aniline, red	lb.	*1.80	@	
orange	lb.	*1.25	@	
Oximony	lb.	.18	@	
Vermilion, English, pale, medium, dark	lb.	.35	@	.40
artificial	lb.	1.70	@	
White:				
Aluminum bronze, C. P.	lb.	.58	@	
superior	lb.	.55	@	
Lithopone, domestic	lb.	.06⅞	@	.07
Ponolith (carloads, factory)	lb.	*.07	@	.07¼
Rubber makers' white	lb.	*.06½	@	.06¾
Zinc oxide, Horsehead (less carload, factory):				
"XX red"	lb.	.09¼	@	
"Special"	lb.	.09¾	@	
French process, red seal	lb.	.09¾	@	
green seal	lb.	.10¾	@	
white seal	lb.	.11¾	@	
(States)	lb.	.08½	@	
Azo, ZZZ, lead free (less carload factory)	lb.	.09¼	@	
ZZ, under 5% leaded (less carload factory)	lb.	.08¾	@	
Z, 8-10% leaded (less carload factory)	lb.	.08¼	@	
Yellow:				
Cadmium, sulphide, yellow, light, orange	lb.	2.00	@	
red	lb.	1.85	@	
Chrome, light and medium	lb.	.27	@	
Ochre, domestic	lb.	.02½	@	.04
imported	lb.	.04½	@	.06
Oil soluble aniline	lb.	*1.20	@	
Zinc chromate	lb.	.45	@	.48

COMPOUNDING INGREDIENTS.

Aluminum flake	ton	28.00	@	
Aluminum oxide	lb.	*.18	@	
Ammonia carbonate, powdered	lb.	.13¼	@	.14
Asbestine (carloads)	ton	25.00	@	
Asbestos (bags)	ton	35.00	@	
Avoilas compound	lb.	.15	@	
Barium, carbonate, precipitated	ton	65.00	@	
sulphide, precipitated	lb.	.07½	@	
dust	lb.	.03¾	@	
Barytes, pure white	ton	33.50	@	

Barytes, off color	ton	[illegible]	@	[illegible]
uniform floated	ton	[illegible]	@	
Basofor	lb.	.04	@	
Blanc fixe	lb.	.04	@	
Bone ash	lb.	.05	@	
Chalk, precipitated, extra light	lb.	.05	@	.05½
precipitated, heavy	lb.	.04	@	.04½
China clay, domestic	ton	8.50	@	20.00
imported	ton	[illegible]	@	[illegible]
Shawnee	ton	[illegible]	@	
Cork flour	lb.	.53	@	
Cotton linters, clean mill run, f. o. b. factory	lb.	.04	@	
Fossil flour (powdered)	ton	60.00	@	
(bolted)	ton	65.00	@	
Diatomite	lb.	.03	@	
Glue, high grade	lb.	.35	@	.40
medium	lb.	.16	@	.28
low grade	lb.	.12	@	.15
Graphite, flake (400-pound bbl.)	lb.	.10	@	.25
amorphous	lb.	.04	@	.08
Ground glass FF. (bbls.)	lb.	.03	@	
Infusorial earth (powdered)	ton	60.00	@	
(bolted)	ton	65.00	@	
Liquid rubber	lb.	.16	@	
Mica, powdered	lb.	.04	@	.06
Pumice stone, powdered (bbl.)	lb.	.05	@	
Rotten stone, powdered	lb.	.02½	@	.04½
Rub-R-Glu	lb.	*.20	@	.25
Silex (silica)	ton	22.00	@	40.00
Starch, powdered corn (carload, bbls.)	cwt.	5.48	@	
(carload, bags)	cwt.	5.84	@	
Talc, powdered soapstone	ton	25.00	@	30.00
Tripoli earth, air-floated	ton	25.00	@	
Tyre-lith	ton	85.00	@	
Whiting, Alba (carloads)	cwt.	.80	@	.90
Columbia	cwt.	.80	@	
commercial	cwt.	1.25	@	1.30
English cliffstone	cwt.	1.70	@	2.00
gilders	cwt.	1.30	@	1.35
Paris, white, American	cwt.	1.50	@	1.75
Quaker	cwt.	.70	@	.80
Wood pulp, imported	lb.	.03½	@	
Wood flour, American	lb.	.01¾	@	

MINERAL RUBBER.

Gilsonite	ton	57.50	@	
Genasco (carloads factory)	ton	55.00	@	
(less carloads factory)	ton	57.00	@	
Hard hydrocarbon	ton	30.00	@	
K-X	ton	*120.00	@	
K. M. R	ton	*40.00	@	60.00
M. R. X	ton	100 00	@	
Pioneer, carload, factory	ton	50.00	@	
less carload, factory	ton	55.00	@	
Raven M. R	ton	.50	@	.70
Refined Elaterite	ton	175.00	@	
Richmond	ton	75.00	@	
No. 64	ton	44.00	@	
318/320 M. P. hydrocarbon	ton	50.00	@	
Robertson M. R. Special (carloads, factory)	ton	80.00	@	
M. R. (carloads, factory)	ton	55.00	@	60.00
Rubpron (carloads, factory)	ton	50.00	@	
(less car, factory)	ton	60.00	@	
Walpole rubber flux (factory)	lb.	.05	@	

OILS.

Castor, No. 1, U. S. P	lb.	.22	@	
No. 3, U. S. P	lb.	.20	@	
Corn, refined Argo	cwt.	25.56	@	
Cotton	lb.	.24	@	
Glycerine (98 per cent)	lb.	.21	@	
Glycerole	lb.	.55	@	
Linseed, raw (carloads)	gal.	1.90	@	
Linseed compound	gal.	*.85	@	
Palm (Niger)	lb.	.17	@	
Peanut	lb.	.27	@	
Petrolatum	lb.	.06	@	
Petroleum grease	lb.	.04¾	@	
Pine, steam distilled	gal.	.85	@	
Rapeseed, refined	gal.	1.60	@	
blown	gal.	1.65	@	
Rosin	gal.	.95	@	
Soya bean	lb.	.18	@	
Tar	gal.	.34	@	

RESINS AND PITCHES.

Cantella gum	lb.	[illegible]	@	
[illegible]	lb.	[illegible]	@	
[illegible]	lb.	[illegible]	@	
Pitch, Burgundy	lb.	[illegible]	@	
coal tar	lb.	[illegible]	@	
pine tar	lb.	[illegible]	@	
[illegible]	lb.	.14	@	
Resin, Pontianak, refined	lb.	None		
granulated	lb.	None		
fused	lb.	None		
Rosin, K.	bbl.	20.90	@	
Shellac, fine orange	lb.	1.30	@	

SOLVENTS.

Acetone (98 99 per cent drums)	lb.	.15	@	
methyl (drums)	gal.	1.10	@	
Benzol, water white	gal.	.24	@	
Beta naphthol, resublimed	lb.	[illegible]	@	
ordinary grade	lb.	.4[illegible]	@	
Carbon bisulphide (drums)	lb.	.06½	@	.07
tetrachloride (drums)	lb.	.11	@	
Naphtha, motor gasoline (steel bbls.)	gal.	.24½	@	
73 @ 76 degrees (steel bbls.)	gal.	None		
68 @ 70 degrees (steel bbls.)	gal.	None		
Solvent	gal.	.20	@	
V. M. & P. (steel bbls.)	gal.	.23½	@	
Toluol, pure	gal.	.26	@	
Turpentine, spirits	gal.	1.71	@	
wood	gal.	1.65	@	
Osmaco reducer	gal.	.30	@	
Xylol, pure	gal.	.35	@	.40
commercial	gal.	.30	@	.35

SUBSTITUTES.

Black	lb.	.10½	@	.20
White	lb.	.12½	@	.23
Brown	lb.	.15	@	.23
Brown factice	lb.	.09	@	.22
White factice	lb.	.11	@	.23
Paragol soft and medium (carloads)	cwt.	18.58	@	
hard	cwt.	18.08	@	

VULCANIZING INGREDIENTS.

Lead, black hyposulphite (Black Hypo)	lb.	.52	@	.56
Orange mineral, domestic	lb.	.13¼	@	
Sulphur chloride (drums)	lb.	.20	@	
Sulphur, flour, Brooklyn brand (carloads)	cwt.	3.15	@	
pure soft (carloads)	cwt.	3.15	@	
superfine (carloads, factory)	cwt.	2.50	@	
(See also Colors—Antimony)				

WAXES.

Wax, beeswax, white	lb.	.70	@	
ceresin, white	lb.	.15	@	.18
carnauba	lb.	.55	@	.60
ozokerite, black	lb.	.60	@	
green	lb.	None		
montan	lb.	*.50	@	
substitute	lb.	.25	@	.40
paraffine, refined 118/120 m. p. (cases)	lb.	.07½	@	
123/125 m. p. (cases)	lb.	.07¾	@	
128/130 m. p. (cases)	lb.	.08¾	@	

*Nominal.

THE INTERNATIONAL FLOOR MACHINE.

Rubber-Tiling Buffer

Interlocking rubber tiling is the accepted floor covering for the salons, passageways and cabins of ocean liners. Modern hotels, banks and hospitals have adopted this form of floor covering for special purposes and usually in preference to all others.

The final process of making rubber tiling is buffing, in order to remove any surface inequalities, and the machine here shown is obviously adaptable for this purpose. The grinder disks are motor-driven by the current from any convenient lamp socket. The machine is self-propelled and is guided over the surface by exerting a slight pressure upward or downward on the handle. (International Floor Machine Co., 149-151 West 36th street, New York City.)

Vol. 61. OCTOBER 1, 1919. No. 1.

TABLE OF CONTENTS.

Editorials:
- The Mexican Riddle 1
- Simplified Chemical Names 1
- Employing the Disabled Soldier 1
- Sending the Foreman to School 2
- British Institute of Patentees 2
- Foreign Trade-Marks Safeguarded in Japan 2
- Minor Editorial 2

Salvaging, Sorting, and Stripping Tires .... Illustrated 3- 4

Better Rubber Trees .... By J. P. Romein 5- 7

Reducing Waste in Rubber Factories. By Robert C. Kelley 6- 9

Government Specifications for Balloon Fabrics 9-10

Judicial Decisions 10

Interesting Letters from Our Readers 10

Eyelets and Grommets in Rubber Goods .... Illustrated 11-12

New Prices for Tennis Shoes 12

Rubber Tariffs of South America 13-18

Peace Problems and Progress 18

Cotton in South America 19

American Chemical Society—Rubber Division Meeting .. 20-21

Chemistry:
- What the Rubber Chemists Are Doing 22-24
- Chemical Patents 24-25
- Laboratory Appliances .... Illustrated 25

Machines and Appliances .... Illustrated 26-27

Portable Tank for Rubber Cement. Rubber Mill Equipped with Individual Motor. Stacking Tote Boxes. Ball-Bearing Grinder and Polishing Lathe. Automatic Controller for Gas-Heated Machines. Scales for Auto Tires and Tubes. The Hand-Type Lectroflator.

Machinery Patents .... Illustrated 27-28

Machine for Forming Solid Tires. Pressure-Cure Footwear Vulcanizer. Other Machinery Patents.

Process Patents 28

New Goods and Specialties .... Illustrated 29-31

Block's Spiral Spring Force Cup. "Reelastic" Winds Up with a Key. New Step-Plate. Tire Shoes and Reliners from Pulled Fabric. Golf and Wear "Shirt-holds." The "Triple Airless"—a New Tire. The Edwards Sectional Solid Cushion Tire. A Toy Sea-plane to Assemble. A White Rubber Coat. Shower-proof Riding Coat. The "Lyner Tyre." Clothes Sprinkler. A Practical Raincoat. Pneumatic Insole.

Obituary Record 31-32

Sir Richard Crawford. W. H. Servis (Portrait). H. P. Thompson (Portrait). F. H. Shepard, Jr. A. W. Hazell.

Rubber Industries Athletic League Outing .. Illustrated 32-33

Editor's Book Table 33

"Determination of Free Carbon in Rubber Goods. "Stubbs Buyers' Directory for the Wholesale Drug, Chemical and Allied Trades." "Dyke's Automobile and Gasoline Engine Encyclopedia."

New Trade Publications 33

New Incorporations 34

American Rubber Trade—News Notes and Personals ... 35-37
- Dividends 35
- Financial Notes 35-36
- Rubber Company Share Quotations 36
- William B. Ruston .... Portrait and Sketch 40
- H. M. Bacon .... Portrait and Sketch 41

Domestic Correspondence:
- Massachusetts .... By Our Correspondent 38
- New Jersey .... By Our Correspondent 38-39
- Ohio .... By Our Correspondent—Illustrated 39-40
- Mid-Western Notes .... By Our Correspondent 41-42
- Pacific Coast ... By Our Correspondent—Illustrated 42-43

Inquiries and Trade Opportunities 43

The Rubber Association of America—Activities of 44-45

The Fifth National Exposition of Chemical Industries ... 45

Foreign Rubber Notes:
- Captain Buckleton Visits German Rubber Factories. Portrait 47
- Great Britain .... By Our Correspondent 48-49
- Miscellaneous Foreign Notes 49-50
- Germany .. By a Special Correspondent—Illustrated 51-52

Planting:
- Hevea Confusa in Singapore .... Illustrated 46-47
- Miscellaneous Planting Notes 53-54
- A New Brazilian Tapping Knife .... Illustrated 53
- Brown Bast on Tapped Hevea 54
- Planting Rubber in West Dutch Borneo. By J. E. Evans 54-55
- Rubber in the State of Vera Cruz, Mexico 55

Patents Relating to Rubber 56-57

United States, United Kingdom, Canada, France, New Zealand.

Trade Marks 57

United States, Canada, France, New Zealand.

Designs .... Illustrated 57

United States.

Markets:
- Crude Rubber 58
  - Highest and Lowest Prices 58
  - Batavia Rubber Market 59
  - Singapore Rubber Auctions 59
- Reclaimed Rubber 59
- Rubber Scrap 64
- Cotton and Other Fabrics 64-65
- Chemicals and Ingredients 66-67

Statistics:
- Brazil, Exports from Pará and Manáos 61
- Canada, Statistics for June 62
- Cotton Statistics 65
- Ceylon Imports and Exports 59
- Federated Malay States Rubber Exports 59
- Java Rubber Exports 59
- Malaya Rubber Exports 59
- Straits Settlements Rubber Exports 59
- United Kingdom Statistics for July 62
- United States:
  - Crude Rubber Arrivals at Atlantic and Pacific Ports as Stated by Ships' Manifests 60-62
  - Exports During July, 1919 (By Countries) 63
- Imports by Months for 1919 59

INDIA RUBBER WORLD

CAOUTCHOUC — HEVEA BRASILIENSIS — FOUNDED 1889 — DICHOPSIS GUTTA — GUTTA-PERCHA

...U. S. Pat. Off. Reg. United Kingdom

Edited by HENRY C. PEARSON

Vol. LXI. No. 2. NOVEMBER 1, 1919 35 CENTS $3.00 Per Year. $3.50 Abroad.

Entered as second-class matter October 4, 1899, at the post office at New York, N. Y., under the Act of March 3, 1879.
Published monthly at [illegible]

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC GUTTA-PERCHA

Reg. United States Pat. Off. Reg. United Kingdom.

Published on the 1st of each month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.
Telephone—Bryant 2576.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, F.R.G.S., Editor

Vol. 61. NOVEMBER 1, 1919. No. 2.

SUBSCRIPTION: $3.00 per year, $1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, $3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft. Post Office or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

DISCONTINUANCES: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

TABLE OF CONTENTS ON LAST PAGE OF READING.

Our Protest Against Radicalism.

FOR the first time in thirty years an issue of this journal appears more than a month late. This was our protest against contract breaking and Soviet rule. We thank our subscribers and advertisers, who, without exception, stood with us throughout the printers' strike.

SUBSTITUTING BANK DEPOSITS FOR PAY ENVELOPES.

MANY EFFECTIVE METHODS of promoting thrift among wage earners have been proposed, but none has more to recommend it than the suggestion that large employers of labor abolish the pay envelope in favor of the bank deposit. According to the plan, each employe would have an account in the firm's bank, to which the amount of his wages would be credited every week, thus getting his total earnings into the bank at the start. From this account he could draw as needed for current expenses, the balance remaining on deposit at interest. Personal pride would thus be stimulated and an inspiration provided to increase the balance every week.

The scheme would appeal to those who had learned through five Liberty Loan drives that the banks are their good friends, and it would mitigate hostility toward banks on the part of others who have never made use of them. Not only would annoyance and waste of time in the long file at the pay window be eliminated, but accounting would be facilitated, and employer and employe alike would benefit through a greater sense of dignity and security than the workingman has ever known.

THE RETURN OF THE BICYCLE.

AMONG MOTORISTS and others who have occasion to to observe city streets and country highways closely there is no doubt that the bicycle is coming back. And its return is no transient college girl's whim, for men and women, boys and girls are riding wheels for reasons that bid fair to last. Chief among these are the death of street railways in small towns and sparsely settled communities and the high fares collected on the trolley lines remaining in business. Secondary reasons quite apart from necessity and economy are the pleasures of bicycling and its benefits as a healthful outdoor exercise.

When the bicycle went out of general use several years ago there were few good roads outside of cities, and those were monopolized by automobiles then just coming into popularity. In contact with the oil used on macadam roads the bicycle tires of those days quickly softened, blistered and blew out. Moreover, the salutary law requiring lights on every vehicle at night was then a discouraging inconvenience. Bicycling became dangerous, expensive and troublesome, and lost favor both as a recreation and a mode of locomotion.

But wider and better roads have become the rule, "oilproof" tires have honestly earned their name, and electricity has eliminated the bicycle lamp nuisance. Bicycles themselves have been improved. All the advantages that first gave the bicycle its hold on the public are again as great as before, and the public is responding to these common sense appeals. Indeed, the manufacture of bicycle tires again promises to surpass its highest past records.

MORE FREE PORTS NEEDED.

CONGRESS is belatedly opening its eyes to the necessity of more free ports in the United States. The Administration will probably recommend the passage of a bill creating them. A free port is an area set aside where goods imported from abroad may be stored without customs while awaiting reexportation or other distribution, and, if required here, taxed according to schedule. Such an area is exempt from all the red tape of customs surveillance, bonded warehouses, bonded manufacturing plants, etc., and the goods so brought in may be mixed and repacked, and reexported with system

and dispatch. London has had one for years, and as a result half our imports from England were products of other lands, brought first to the British free port, then resold. As a result, the United States, the greatest user of rubber in the world, got most of this product through England, where the price was set and we paid it, plus the freight.

UTILITY OF THE RUBBER HEEL.

ALTHOUGH THE RUBBER HEEL has been on the market for many years, its utility as compared to the leather heel is only recently admitted. The sale has now run into millions of pairs, and popular prices at retail range all the way from a dime to 50 cents a pair.

Combining all the resisting qualities of the best leather, a rubber heel has the advantage of being resilient, is not cut away as readily as the leather heel on concrete or gravel, is noiseless and saves one from the nerve-tearing jars at every step.

A special pair of rubber heels was recently made for experimental purposes and after being worn for six months were still in good condition. The cost was 75 cents, and on this account they would not be popular as the cost attached would be $1 a pair. Even at that price they might be more economical than leather heels.

PLANTATION SHARE PROFITS.

NOTWITHSTANDING the continued surplus and low price of crude rubber, British investors still find rubber shares highly profitable. Ample evidence of this is to be seen in the annual reports of well-established plantation companies. For example, the Vallambrosa Rubber Co., Limited, one of the pioneer plantations in Malaya, realized a gross average price of 44½ cents per pound for the total 1918 crop as against 48 cents the previous year, while the "all in" cost of production was 21½ cents per pound as against 23 cents the previous year. In other words, the net profits still remain a trifle above 100 per cent and have enabled the directors to pay an *ad interim* dividend of 25 per cent and to recommend a final dividend of 37½ per cent, making the handsome total of 62½ per cent for the year while still ensuring adequate working capital and an ample reserve.

Doubtless the days of better than 200 per cent yearly earnings, which created a sensation just before the war, will never return, and perhaps some of the younger companies will never even reach 100 per cent dividends, but so long as present conditions continue plantation shareholders have nothing to complain of. By comparison the earnings from rubber manufacturing stocks are a mere pittance. Henceforth, however, demand seems unlikely to exceed supply, and eventually crude rubber may be produced on a margin of profit comparable with that on sugar and similar agricultural necessities of life.

CHINA YEARNS FOR RUBBER FACTORIES.

CHINA now being more or less in the limelight its possibilities as a field for rubber manufacture are not being overlooked. British and American tire manufacturers already maintain small vulcanizing plants there where the repairing of motor car tires is done efficiently. However, until Chinese roads are put into better shape there seems to be no reason to expect a great expansion in the automobile market outside the principal cities. The jinrikishas (the popular vehicle for the local transportation of passengers) are practically all equipped with pneumatic tires, Peking alone having 15,000 in service. But the outlook for rubber footwear manufacture is large, if some enterprising firm supplies the right kind of shoes. The Chinese shoes are made of cloth, good enough for dry weather, but very uncomfortable in the rainy season. About $500,000 worth of rubber goods are imported into China annually. With plenty of cheap labor and a vast crude rubber supply near at hand, rubber factories are bound to come in time.

GERMANY REVOLUTIONIZES RECLAIMING?

AT LEAST that is the claim of the company owning the Runge and similar processes. A cursory view of all of the solvent processes, German, British, French and American, however, does not bear out the claim.

No solvent process adds value to the rubber extracted. In fact the reverse is true. As for valuable by-products they are few. The most important is the fabric. This can be used to a limited degree as shoddy in mats and floor covering, or as fabric in tire accessories, repair and rebuilding. Where rubber and fabric are plentiful and prices normal the solvent process can hardly compete with existing standard reclaiming proccesses. The German reclaimer is evidently still living in an atmosphere of blockade scarcity and high prices.

THE FIRST AFTER THE WAR NUMBER OF THAT VALUABLE technical journal the *"Gummi-Zeitung,"* dated July 19, 1919, has been received. It opens with an article rejoicing that peace has been declared and it takes the ground that it is no use to go into the why and wherefore of Germany's collapse; facts as they are must be faced and every effort made to upraise Germany again. The way to accomplish this is to work and to trust to the future. The blockade is over, commerce is free once more, peace and the tasks that peace imposes are at hand. Set to work and while working keep thinking: "Germany and the German people must become once more what they were."

FRESH ATTENTION IS CALLED TO THE INCREASED USE OF non-skid tires on motorcycles and the increased use of this vehicle as a delivery car on account of its qualities as a time and money saver in the handling of light parcels. It means more tires and still more.

An Examination of German Synthetic Rubber.

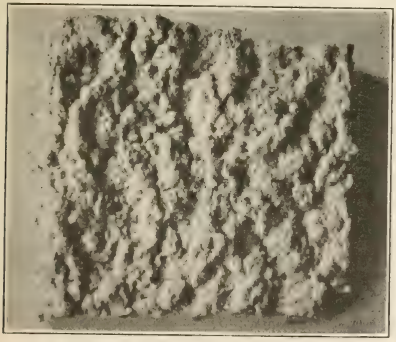
By Lothar E. Weber, Ph. D.

The synthesis of rubber has always been a topic of interest to the rubber industry. This interest probably reached a maximum in the summer of 1912, when the experimental results of Drs. Perkin and Hofmann were laid before the chemical world. Rubber had been synthesized as a test tube experiment by numerous investigators in the course of the previous twenty years, but these two men, the respective leaders of independent groups of English and German scientists, were undoubtedly the first to produce synthetic rubber on something more than an academic scale.

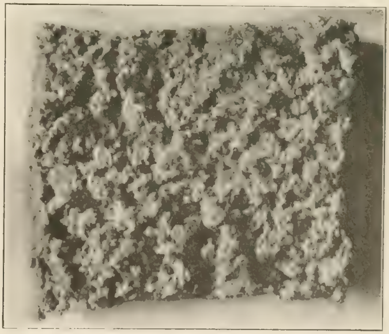
The coming of the war had a marked influence on these investigations. The possibilities of a rubber shortage in England being remote, her scientists naturally turned to the solution of more pressing problems. In Germany, however, the rubber situation became acute, even in the early months of the war. Realizing as she did the importance of rubber as a secondary instrument of warfare, it was but natural that she should make a great effort to effect its synthesis, being amply provided with the greatest incentive for inventive research, namely, necessity. One has only to recall the almost humorous methods of petty smuggling to which she resorted, to realize her pressing needs for crude rubber. It is to be expected, then, that she should have made great strides in the commercial development of the synthetic product.

The four samples of synthetic rubber, which the Editor of The India Rubber World obtained from Germany and submitted to the writer, exhibited a striking resemblance to natural crude rubber. Three of the samples were intended for the manufacture of soft rubber goods and the fourth for hard rubber. The first three named took the form of crêpe, about one-half-inch in thickness. Their color ranged from a reddish-orange, through a pinkish-brown, to that of the characteristic dark-brown. In fact, the last-named sample bore a striking resemblance to a thick brown crêpe. The sample of pinkish-brown color had very much the appearance of washed Massai. The light sample was somewhat more reddish than first crêpe, as we know it; but otherwise it was of excellent appearance.

All of these rubbers possessed considerable toughness and elasticity. The lightest and the darkest were apparently the strongest, and after stretching resumed more equally their normal shape and size. The pinkish sample had considerable strength, but was less fibrous, and could be disintegrated without great difficulty. The dark sample was highly resistant in this respect, much more so than an average brown crêpe, in fact, its behavior was almost characteristic of an admixture of crude and reclaimed rubber.



Light Synthetic Crêpe For Soft Rubber Goods.



Medium Synthetic Crêpe for Soft Rubber Goods.

The light-colored sample showed scarcely any indication of tackiness. This condition was somewhat more apparent in the case of the pinkish sample, chiefly on account of some small viscid globules on the surface of the rubber.

The fourth sample, which was intended for hard rubber, resembled a soft art-gum eraser in color and texture. Although the sample was somewhat spongy, it returned to its original shape rather slowly after compression. It was a trifle sticky to the touch, but by no means tacky. Black combs said to have been made from this rubber had the characteristic black finish and high gloss, which is observed in the highest grade of hard rubber.

Little is known as to the method of preparation of the samples. It is reasonable to suppose, however, that they were produced at the large dye works of Bayer, at Leverkusen. The method employed at this factory for synthetic rubber is to use acetone as a raw material, and by means of aluminum to convert it into a product known as pinacone. The pinacone is then converted into methyl-butadiene, a substance bearing a very close chemical relationship to isoprene. This substance will be recognized as having always been prominently mentioned in connection with the synthesis of rubber. The methyl-butadiene is a thin liquid of low boiling-point, and by the chemical process of polymerization, is converted into synthetic rubber. According to Lieutenant-Colonel J. F. Norris,[1] the polymerization process requires from four to six months. It is carried out at a temperature of 60 degrees C. The product thus obtained is technically referred to as methyl rubber.

The chemical analyses of the four samples were as follows:

	No. 1 Per Cent.	No. 2 Per Cent.	No. 3 Per Cent.	No. 4 Per Cent.
Acetone extract	[illegible]	1.95	[illegible]	1.59
Mineral matter	0.02	0.15	0.09	0.09
Nitrogen	0.12	0.06	0.16	0.07

The acetone extracts are all surprisingly low. They were of a brownish color and of a hard resinous appearance. The nitrogen values are interesting and without doubt signify the presence of

[1] "Journal of Industrial Engineering Chemistry," Volume 11, page 819.

an organic accelerator. In fact, it is rather probable that the acetone extract consisted in part of such accelerator. Owing to the smallness of the samples no attempt was made to identify the nature of the latter. It was clearly evident, however, that none of the organic bases that are in general usage in this country to-day for accelerating vulcanization had been employed. Probably the accelerator present was a piperidine derivative.

For the purpose of determining the physical properties of the synthetic products the following formula was employed:

	Parts.		Parts.
Rubber	50	Sulphur	5
Zinc	45	Hexamethyleneamine	½

DARK SYNTHETIC CRÊPE FOR SOFT RUBBER GOODS.

The samples being so small, the three crêpes were blended together and used as a whole. When put on the mill they disintegrated and fell apart rather quickly. In the course of a few minutes, however, the particles began to agglomerate, and in due time assumed the familiar plastic condition of broken-down rubber. The mass differed from natural rubber in that, notwithstanding its plasticity, it was exceedingly tough and this toughness became more marked after the addition of a portion of the compounding ingredients. As the latter were added the toughness of the rubber continually increased, although its plasticity was such that the minerals were readily absorbed.

The mixture was vulcanized in a press for forty-five minutes at forty-five pounds. The physical tests obtained are tabulated below. For the sake of comparison, there is inserted the physical tests obtained from an average sample of first latex crêpe vulcanized in the same compound.

	Synthetic Rubber.	First Latex Crêpe.
Tensile strength	910 lbs.	2800 lbs.
Elongation at breaking point	750%	675%
Permanent set	25%	25%

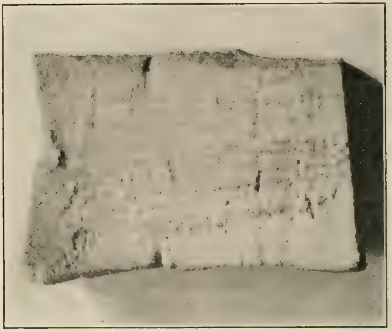
In order to determine the aging properties of the synthetic rubber the vulcanized samples were subjected to a temperature of 150 degrees F. for seven days. The following results were obtained:

	Synthetic Rubber.	First Latex Crêpe.
Tensile strength	800 lbs.	2230 lbs.
Elongation at breaking point	650%	650%
Permanent set	25%	25%

The results of the physical tests do not compare very favorably with those of a high-grade natural rubber. They are, in fact, more comparable to the properties of an inferior brown crêpe. The whole general appearance of the vulcanized synthetic rubber, and especially its flabby and lifeless condition, reminded one very strikingly of vulcanized brown crêpe.

It will naturally be asked whether this method of synthesizing rubber is capable of large scale technical application. In other words, is there any reasonable possibility of synthetic rubber becoming the competitor of the products of the plantations?

Prophecy is always dangerous and frequently idle. On the basis of the above samples, however, closely confirmed by rumor and hearsay, very big improvements must still be made in the synthetic product in order that it may compete in quality with natural rubber. It is not fair to assume that the scientific possibilities of improving and cheapening plantation rubber are just as great as the scientific possibilities of the present art of synthesizing rubber?



LIGHT SYNTHETIC BLOCK RUBBER FOR HARD RUBBER GOODS.

The complete victory of synthetic indigo over the natural dyestuff would have taken a different course had the indigo plantations been as scientifically operated as are the rubber plantations to-day.

It cannot be denied that the production of this rubber is an astounding chemical accomplishment. It may be said, without much danger of contradiction, to represent the climax of modern synthetic chemistry, in that for the first time it has been possible to produce upon a commercial scale a representative member of the group of enormously complex substances known as colloids. As such it marks the beginning of a new era in chemical synthesis. It is very problematical, however, whether the benefits of this discovery will accrue directly to the rubber industry. Chemistry as a whole becomes enriched and especially that branch of chemistry dealing with colloids. It has become generally recognized during recent years that nearly all biological processes are colloidal in their nature, and it is in the further study and synthesis of colloids that the knowledge gained from the synthesis of rubber should receive its greatest application.

COLONEL OSTERRIETH GREETS HIS KING.

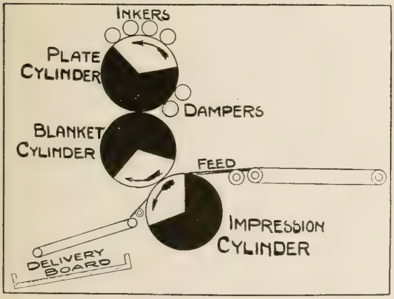
Conspicuous among those prominent in the greeting of the Belgian King and Queen in New York City early in October was the commanding figure of Colonel Leon Osterrieth, military attaché of the Belgian Embassy. Colonel Osterrieth, it will be recalled, was a crude rubber merchant in Antwerp and owns rubber plantations in Java and Malaya. He was the delegate for Belgium at the International Rubber and Allied Trades Expositions of 1911 and 1914 and was on his way to the Rubber Congress in Java when war was declared in 1914. After gallant service in the Belgian Army he came to America with the Belgian Mission in 1917 and is now stationed at Washington.

Rubber Instead of Typesetting.

Rubber instead of typesetting is not a mere possibility, but a practical reality. In printers' circles the process has been known quite a while, but somehow it never attracted very much attention and was comparatively little used. Those who saw possibilities in the process admitted that something or other would have to happen, something quite unforeseen probably, before wider circles would become interested. Then, quite recently the unforeseen happened. A group of compositors went on a "vacation," and tied up the New York publishing industry for eight weeks. Meanwhile a few men started thinking quite hard, and this thinking bore fruit, various methods of doing away with typesetting being tried. In one of these processes rubber plays an essential part.

A well-known New York publisher has just published a book, the whole of which has been produced from photographs transferred to rubber without any typesetting at all. It is the first book ever issued in this manner in the whole history of publishing. The work was done for the publishers by one of the many offset printing firms of New York City. Before describing the process by which the book was produced, however, we will briefly outline the history of offset press work.

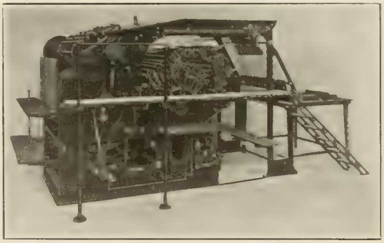
The first actual tin-plate rotary was conceived in 1903 and was exhibited by George Mann & Co. in 1909 at the printing exhibition in London. Shortly after this, Ira W. Rubel chanced to be in a lithographic machine room, when the operator failed to feed a sheet of paper, the impression taking place on the rubber blanket. A few seconds later, on the back of the next sheet fed to the press, a better impression was found than the one on the front of the sheet made by the metal. The operator probably soon forgot the occurrence, but not Ira W. Rubel.



The Rubel Type Rotary Offset Machine.

Two years later his machine embodying the new use for rubber was on the market. Offset press work was completely revolutionized by the new machine, and it is a matter for regret that Mr. Rubel only survived its introduction by about two years. Since that time various machines have been invented; they are associated with the names of Mann, Harris, Waite, Potter, Scott, Hall, Fuchs, Lang, Killogg, Bentley, Jackson, Saville and others in the United States and Great Britain.

Offset printing has been used for a dozen years, more or less. Letter-heads, illustrations and a few other things have been quite extensively produced by the process. And many firms have done excellent work along these lines. But, as already stated, very few men thought that offset work would ever compete with general typography, ordinary printing was so well established, it could be done so satisfactorily and at fairly reasonable rates, there being no lack of compositors, while, on the other hand, offset work demanded highly skilled men, of whom there were not



Mann Patent Two-Color and Perfecting Press.
This Machine Will Print Two Colors Simultaneously on One Side of the Sheet, or One Color on Each of the Two Sides at the Same Time.

many. It was indispensable to do the right thing at the right moment; a slight oversight might result in a poor job. Besides which, in the early days the stone used gave a good deal of trouble; it frequently broke and was expensive.

In the present-day rotary machines stone is replaced by aluminum or zinc. Mr. Rubel, if he were alive to-day, would hardly have an opportunity to catch a feeder failing to feed a sheet, as most of the larger machines have automatic feeders. All the offset machines produce prints as set-offs instead of doing so by direct printing. The last impression can be made as clear and distinct as the first. There are zinc plates in the market made by manufacturers by more or less secret processes, but many firms doing offset printing make their own plates at less than half the cost.

One advantage of the offset process is that any kind of paper can be used advantageously. Work on cards succeeds equally well, while unusually pleasing effects have been produced on celluloid, as no damping of any stock is necessary. It has even been found possible to turn out the cheaper kind of little flags, which are so largely sold at parades and public celebrations, by the use of one of the existing offset presses.

Absolutely high-grade color work can be done by the process, even nine-color work in perfect blending has been exhibited. Salesmen of the various machines have naturally praised them very highly and yet purchasers of the machines have frequently been disappointed by the quality of the work turned out by their men, thoughtlessly blaming the machines and the salesmen.

The machine operators must "know how" and take pride in their work. The machines respond to skilful control and fine work is the result. First-class operators earn first-class incomes, which are gladly paid by their employers in this line of business. It is the ability of offset press workers and their willingness to use their ability that gives value to the machines. When the work turned out is poor, the operators are probably to blame, though in some cases other factors enter into consideration.

One very striking difference between ordinary printing presses and offset presses is that on the latter copper plate engraving, reading matter, half-tone work, etc., can be printed at one and the same time. At present, reading matter produced on offset

machines without the aid of printer's type offers one drawback which is very noticeable, and that is the unevenness with which the lines end. The reason for that, however, is that the text is typewritten on ordinary typewriters, and then photographed. The lines end, therefore, as all typewritten matter ends, very irregularly. The experimental departments of all the greater typewriter companies are now hard at work seeking a way to make lines end evenly, and one of these days American ingenuity will solve the problem. Offset work will then find new fields of usefulness which it has up to now been quite unable to enter with any notable success.

Offset work is cheaper than ordinary typographical work, and can be turned out more rapidly. One of the reasons for greater economy is the difference in the time necessary for the make-ready. In ordinary typographical work the make-ready frequently takes up hours. In offset work that which takes the place of the make-ready requires an almost negligible amount of time, with a corresponding saving of money.

There are four stages in the execution of the work which can be described so that the reader will fully understand the process.

1.—The text, which has been carefully typewritten on new machines to insure equal pressure of each letter on the paper and to guarantee perfect alinement, is photographed.

2.—An ordinary zinc line plate is made from the photographic glass negative thus obtained, the negative image being reversed to a positive image in the course of the transfer after the customary manner of photographic process work.

3.—The zinc plate, ordinarily with several others, is arranged in a form as usual and put in the press, where it is inked in the customary manner by rollers, and an ink impression of the plate is transferred to a rubber covered metal cylinder, this impression being negative in the sense that the type is reversed left for right and reads backwards.

4.—The operation of the press is so timed and arranged that a sheet of paper is then fed through it and the ink impression transferred by direct contact from the rubber blanket on the cylinder to the surface of the paper, where it becomes a positive impression reading from left to right.

After use, the rubber-covered cylinder is very easily cleaned, and the surface can be used again and again, until the rubber is worn out. The rubber blanket may last less than a month or over two months, depending on the amount of work done, and particularly on the kind of stock used. Coarse, hard paper will naturally wear out the rubber sheet quicker than other kinds of stock.

When black ink is used, from 3000 to 4000 copies per hour can be run off a good machine. Color work is naturally done much more slowly. The ink used for offset work dries very quickly, and the stock, as already mentioned, is never dampened, so that the sheets coming off the press can be almost immediately folded into booklets, books, etc., and be delivered to the customer. Sheets coming off typographical presses must be allowed to dry for a considerable while before they can be folded or handled in any way.

The machines used to-day for offset work are not perfect, but manufacturers will now doubtless feel encouraged to remedy defects. The largely increased fields of sale now opening up offer possibilities of augmented profits sufficient to warrant considerable effort at improvements.

Rubber men will probably be interested in a few remarks on the rubber covering for the rollers, with which we will end our story.

The thickness and the degree of elasticity of the rubber blanket covering the cylinder are features that have demanded many and long-continued experiments. The entire blanket must be of absolutely uniform thickness, as the slightest defect in its uniformity renders the whole unfit for use.

The best printer's blanket for offset work has always been imported from Europe. Before the war, the best blanket, in small sizes, was made in Germany, but the Germans were utterly unable to succeed in the larger sizes, in which Great Britain has achieved preeminence, producing extremely fine printer's blankets up to 70 inches and even more in width. Before the war these imported blankets sold in the United States at $4 a square yard. The price varies these days considerably but is, of course, much higher.

The expansion of offset printing in tropical and subtropical countries depends largely on the rubber chemist. Printer's blankets that give good results in New York or London may not give satisfaction in very hot or damp countries. These sensitive rubber blankets suffer from high temperatures combined with great atmospheric moisture.

Here is an interesting and lucrative field for the American rubber industry.

INTERESTING LETTERS FROM OUR READERS.

DESIRES TO SUPPLY ZINC SULPHIDE TO THE TRADE.

To the Editor of The India Rubber World:

Dear Sir:—A few days ago I was showing a sample of zinc sulphide to a subscriber to your magazine and a manufacturer of rubber goods. He was not using zinc sulphide himself but claimed that it is peculiarly adaptable to use in the rubber trade in the manufacture of particularly white goods, due to sulphur from the sulphide in some way reacting with the rubber.

We looked through a recent number of the magazine to find a quotation on zinc sulphide, which, he said, was formerly listed there. He then suggested my addressing you as the best authority on the wholesale market for zinc sulphide and as to who are using zinc sulphide now.

I hope that you may be able to furnish me this information, for I have a small plant for making pure zinc oxide in hundred-pound lots that can be immediately turned into a zinc sulphide plant, and can expand to a large plant should I find a large field for the product. This information would be most timely to me, and if there is a demand for zinc sulphide, will also be of value to your advertisers.

Awaiting this information and a reply from you, I am,

Yours most sincerely,

Samuel T. Halsted.

163 Rubidoux avenue, Riverside, California.

SEASONS' SUPPLIES OF FICUS RUBBER.

To the Editor of The India Rubber World:

Dear Sir:—I would ask you to be so kind as to bring me in touch with a solid American factory (no dealers) which is willing to buy *Ficus* rubber in seasons' supplies of from 10,000 to 30,000 pounds. A sample of the same I will send for their pproval the moment I receive the address. Only few estates in Java produce *Ficus* rubber, most of them cultivate *Hevea brasiliensis*, so there is here practically no market for this sort of rubber. Thanking you in anticipation,

Yours very respectfully,

J. Reints Bok.

Soerabaya, F. M. S.

RUBBER GOODS FOR AUSTRIA AND SERBIA.

William Ford Upson has been appointed Trade Commissioner to Vienna by the Bureau of Foreign and Domestic Commerce, and at an early date will proceed to his post to conduct an investigation of general commercial and economic conditions in Austria and Serbia. Mr. Upson was an officer of the American Red Cross during the war and later the American delegate to the Inter-Allied Trade Commission at Vienna and is well informed regarding conditions there. Among the many things needed by Austria and Serbia which, in his opinion, America can best supply, are rubber goods, footwear, clothing, cotton oils and fats, petroleum and its products. American capital and business acumen along broad constructive lines will be required to establish business relations.

Poisons in the Rubber Industry.

The Rash Produced by Hexamethylene-Tetramine and a Means of Prevention.

By Norman A. Shepard and Stanley Krall

Though the occurrence of a rash among rubber workers has long been observed it is only recently, since the introduction of organic accelerators of vulcanization, that the skin eruption or dermatitis has been at all serious or prevalent. By 1917, however, the problem had become so general that the Rubber Section of the American Chemical Society requested its Committee on Organic Accelerators to investigate the toxic properties of the more commonly used accelerators. The report[2] of this committee which was presented in September, 1918, at the Cleveland meeting of the Society brought out the fact that most of the common accelerators had distinctly poisonous properties. The report covered aniline, paraphenylenediamine, thiocarbanilide, p-nitroso dimethylaniline and hexamethylene-tetramine; it emphasized the necessity of studying accelerators not only from the standpoint of the accelerating action but also as regards poisonous properties.

In the study of accelerators, the Firestone Research Laboratory has devoted much attention to the question of toxicity, with the purpose of finding an accelerator combining excellent acceleration with a minimum of toxic action. Knowing that many rubber companies are using hexamethylene-tetramine or "Urotropin," it was thought that a study of the toxicology of this substance would be of interest not only to ourselves, but also to those who are already using this accelerator. The investigation has been extended to cover the probable cause of its action and to find, if possible, an antidote or simple means of prevention.

The action of hexamethylene-tetramine was summarized in the Report of the Committee on Accelerators as follows:

Symptoms of Poisoning.—Rash and inflammation of skin which has been in repeated contact with stock containing this material. In severe cases, blisters filled with watery fluid result.

Antidote.—Cleanliness and care in regard to clothing are the best preventatives. Change of occupation will cause the rash to disappear, leaving no permanent effects.

This description agrees closely with that taken from the United States Dispensatory[3] in which it is stated that, "Locally, hexamethylene-tetramine is mildly irritant and feebly antiseptic. A measles-like rash with much itching has been noticed after its continuous use."

In order to study the nature of the irritation ascribed to this accelerator, the tetramine was applied in powdered form and in water solution of various concentrations to different parts of the body. Five men from the Research Laboratory were selected for these tests and applications were made on the wrist, forearm, chest and thigh. These applications were repeated several times each day for several days, yet there was no irritation or indication of rash in any case and not even the slightest itching. Thinking that possibly the perspiration might function in the production of this rash, applications were made on the feet and even under the arm-pit, where the perspiration flows most freely. Again, no action could be observed. Even applications following a very hot bath, thoroughly opening the pores and causing a typical "sweat," resulted in no irritation whatsoever.

As a result of these negative experiments, it was decided to introduce this accelerator into a factory compound in order to study its effect under actual working conditions. The workmen handling this particular experimental stock were carefully observed. At the time this test was begun the weather was quite cool and for some time no deleterious effect was observed. However, with the approach of warmer weather the action of hexamethylene-tetramine began to manifest itself. It usually appeared first as a rash on the wrist or forearm, and in many cases was confined to these parts. The action became more pronounced, however, when really warm weather arrived; not only the forearms, but also the face and neck became involved and to such an extent in certain cases that a large portion of the face was affected, especially around the eyes. In general the inflammation was confined to the exposed parts, though occasionally it appeared on the shoulders, legs and even across the stomach. There seemed, however, to be no tendency for this rash to spread to any great extent beyond the parts which actually came in contact with the stock; the cases on the face and neck probably resulted from contact with the hands.

The dermatitis produced by contact with the stocks containing hexamethylene-tetramine was indentical with that described by Kratz[4] in an article on the "Control and Prevention of a Rash Among Rubber Factory Employes," though his paper mentions no particular accelerator or other substance as the cause of the rash. Quoting from this article, "The rash almost invariably the heat. This condition is closely followed by the appearance appears as a simple erythema, such as is generally attributed to of sac-containing eruptions or vesicles similar to those characteristic of ivy poisoning. These vesicles are quite small, seldom being larger than pin-heads and are grouped in varying arrangements, from being widely disseminated, to quite closely aggregated. They rarely retain their integrity for more than 48 hours, being broken by friction from the clothes or by the patients' rubbing and scratching, or, if this does not occur they soon become filled with a watery serum and rupture spontaneously in consequence of the exuded fluid."

The perspiration undoubtedly plays an important part in the production of this rash. It becomes almost epidemic with rise in temperature. Following a few hot or sultry days productive of profuse perspiration, a marked wave of rash will spread among the men handling the raw hexamethylene-tetramine stocks; a few cool days and it subsides, only to reappear again when the hot weather returns. This observation also agrees with that of Kratz, who writes, "Though the rash is most prevalent during hot weather, particularly in humid midsummer, it certainly cannot be attributed solely to the heat; nevertheless the abnormal perspiration produced by the heat undoubtedly does play a part in rendering the skin most tender and susceptible to infection. Throughout the factory the fundamental cause of the rash will probably be traced to the irritation produced by the careless handling of green stocks or liners."

On studying the situation closely for several months and during the hottest weather, a marked immunity to the action of the hexamethylene-tetramine was observed. Only a small percentage of those handling the stock was affected. One would find right next to an especially virulent case, men performing exactly the same operations and handling the same stock, absolutely free from any sign of irritation. This undoubtedly explains the negative results which were obtained in the laboratory when the strong solutions of hexamethylene-tetramine were first applied. In order to prove that the hexamethylene-tetramine was really responsible for the trouble, a patient was selected for experimentation from among those who had shown themselves susceptible to this rash. This patient had had the rash very

[1] Contribution from the Research Laboratory of the Firestone Tire & Rubber Co., Akron, Ohio.

[2] "Journal of Industrial and Engineering Chemistry," Volume 10, 1918, page 865; The India Rubber World, November 1, 1918, page 82.

[3] Fifteenth Edition, page 611; 20th Edition, page 545.

[4] The India Rubber World, Volume 57, 1917, page 145.

severely for nearly two months, the hands, wrists, forearms, face and neck all being involved. The part selected for the test with the concentrated accelerator was the arm above the elbow, where the skin was perfectly clear and where the patient said he had never had any rash. An application of a 50 per cent water solution of hexamethylene-tetramine was made by moistening six plies of sterile gauze bandage with the solution and securing it with bandage and adhesive tape. This method of application was selected to insure constant contact with the skin and at the same time protect the treated spot from contamination with other substances. In the course of twenty-four hours, an eruption developed on the treated surface having all the characteristics typical of the "rubber rash." The other arm above the elbow was similarly treated, with the same result at the end of twenty-four hours. During these tests the forearms, face and neck on which the patient had previously had the rash were clearing up showing that the rash above the elbow was not due to spreading from the forearms. No more applications were made for a period of eight days, at the end of which time the skin above the elbows had returned to its normal condition. Again, hexamethylene-tetramine was applied in 50 per cent solution and again the rash was reproduced above the elbows. Two other patients susceptible to rash were similarly treated with this 50 per cent solution; in both cases a rash was produced. All these tests were conducted while the weather was warm and the patients perspired freely while working. These results were so clean cut that they left little doubt as to the irritating action of hexamethylene-tetramine.

The absence of any rash, even on the hottest days, among those who handled the cured stock was very pronounced; as far as the writers are aware, not a single case was reported. In view of the recent work of Bedford and Scott on the "Reactions of Accelerators During Vulcanization,"[5] this is readily explained. These investigators have shown that hexamethylene-tetramine reacts with sulphur at the vulcanization temperature, forming among other things, hydrogen sulphide, carbon bisulphide, ammonia and a sulphocyanate.

In order to determine a suitable substance to use as a preventive, an explanation of the mechanism of the action of hexamethylene-tetramine was sought. As the occurrence of rash is closely associated with the excretion of perspiration, the possible chemical changes which might result from its action on hexamethylene-tetramine were investigated. According to Schamberg[6] the perspiration is normally acid; this has also been demonstrated by actual tests by the writers. It is well known that hexamethylene-tetramine is readily decomposed by acids. Hartung[7] has shown that warming with strong acids results in the formation of formaldehyde, and more recently, Ischidzu and Inouye[8] have demonstrated that the weaker acids such as acetic, lactic and succinic acid bring about the same result; these investigators also showed that hexamethylene-tetramine is decomposed to some extent even on boiling the aqueous solution. Its use as a bladder antiseptic depends on the liberation of formaldehyde in the bladder due to the presence of acids in the urine; Suder[9] has shown that when the urine is alkaline this decomposition does not take place. It seems a logical conclusion, therefore, that when hexamethylene-tetramine is absorbed by the skin, formaldehyde will be produced in the pores under the influence of the sweat acids.

The corrosive and toxic action of formaldehyde has long been known. Remington and Wood[10] state that formalin is an intense local irritant both to the mucous membrane and, if in sufficient concentration, to the skin. It has been the writer's experience, however, that the action of a solution of formaldehyde is quite different from that produced by hexamethylene-tetramine. Application of 40 per cent formalin produced a hardening of the skin followed by a scaly appearance due to cracking of the surface. This eventually peels off leaving the lower skin perfectly clear. There is no reddening of the skin, nor any itching sensation.

Formic acid on the other hand is extremely irritative to the skin. On making an application of the strong acid, severe smarting and itching occurs almost immediately, followed shortly by the production of a blister. After twenty-four hours the blister subsides and the affected spot has a pus-like appearance. A thick scab slowly forms and quite a perceptible scar remains after the sore has healed, showing that the acid burns quite deeply. The action of the formic acid resembles very much that of hexamethylene-tetramine, only very much intensified.

This study of the respective effects of formaldehyde and formic acid on the skin has led the writers to believe that the action of hexamethylene-tetramine is due to the formation of formaldehyde in the pores under the influence of the sweat acids, followed by subsequent oxidation of the aldehyde in the pores to formic acid, and that the latter is the active irritant. Though there is no proof that such an oxidation does occur in the pores of the skin such an action seems not so improbable, when it is considered that formaldehyde has been shown to be rapidly oxidized in the system, appearing in the urine as formic acid.[11] The reason for the difference in action of formaldehyde as such and formaldehyde generated from hexamethylene-tetramine may be attributed to difference in absorption. Hexamethylene-tetramine is extremely soluble in water (1 part dissolves in 1.2 parts of water at 12 degrees C.) which permits of rapid absorption through the pores. Formaldehyde, on the other hand, though very soluble in water, when applied to the skin quickly hardens the surface, making it impervious to further absorption. In fact, the property of formaldehyde has been utilized for the purpose of checking excessive perspiration.[11]

On the assumption then that the acid of the perspiration is the primary cause of the rash, neutralization of this acid should prove an effective preventive, and furthermore, if the actual irritant is formic acid, neutralization of this would prevent its action, if it were formed. Any substance used to obtain this result should be itself non-irritating to the skin, preferably neutral in character, and sufficiently soluble in water to be easily absorbed by the skin. Sodium bicarbonate or "baking soda" meets all these requirements. It is neutral, quite soluble in water (one hundred parts of water dissolve 9.6 parts of the salt at 20 degrees C.) and non-irritating, and consequently was selected for experimentation as a preventive means.

In applying the sodium bicarbonate, the method of treatment employed consisted in first thoroughly washing the affected part with soap and water, drying and then applying a saturated solution of the bicarbonate, allowing this to dry without wiping. The thorough washing opens the pores of the skin and allows better penetration of the bicarbonate wash. On drying, a white film of the salt remains as a thin coating which adheres with surprising tenacity. Two applications daily were made, at the beginning and at the middle of the shift. Before leaving the factory the affected parts were washed and no further application made at that time.

The first patient on whom this treatment was tried responded rapidly. The solution was applied to the arms, face and neck, all of which parts were affected. In the course of a week all the rash had completely disappeared, and what was of chief interest, no new eruptions had developed. Since the weather was fairly cool during this period, it might be concluded that this was the cause of the rapid disappearance of the rash. To prove other-

[5] Presented at the fall meeting of the American Chemical Society, September, 1919.
[6] "Diseases of the Skin and Eruptive Fevers," page 26.
[7] J. Prakt. Chem. (2), 46, 16.
[8] J. Pharm. Soc. Japan, January, 1906.
[9] **United States Dispensatory, 15th Edition, page 611.**
[10] United States Dispensatory, 20th Edition, page 638.

[11] Remington and Wood, *loc. cit.*

wise and eliminate the temperature factor, the use of the wash on the left arm was discontinued while continuing the application to all the other exposed parts; five days later the left arm, and the left arm only, was broken out with the typical rash. Thinking possibly that this might be due to more frequent contact with this arm with the stock, the treatment was omitted from the right arm and again continued on the left. Four days later an eruption appeared on the right arm, while all the other parts treated with bicarbonate were entirely free from any dermatitis. This patient used bicarbonate for a period of four weeks and during that time had no sign of rash except on the forearms when the wash was omitted as previously mentioned. Before using bicarbonate, this patient had had the rash on some exposed part of his body almost continuously for nearly three months.

A squad of ten men was selected for further tests as to the efficacy of the bicarbonate solution. These men, selected from the various departments handling this stock, had all been troubled more or less severely with rash. This squad was supplied with the bicarbonate wash and carefully observed from day to day during a period of two weeks. All, without exception, showed marked improvement; the old rash healed rapidly and no new eruption developed. During the course of these observations there were several very warm days, which brought on quite a wave of rash among those not being treated. Not one member of the squad, however, developed any rash during this hot spell.

On the strength of these results bicarbonate solution was provided, so that all the men handling the raw stock containing the hexamethylene-tetramine could obtain it if troubled with this rash. Though it was not possible to obtain as accurate data on all those applying the solution, the reports obtained from both the foremen and the men using the solution were very encouraging.

At the Eighth Annual Congress of the National Safety Council held at Cleveland on October 4, 1919, a representative of the Hood Rubber Co. stated that they had had very considerable success in combating this rash by using an aqueous solution of borax containing gum arabic. He stated that this mixture dried with some difficulty, and they had installed electric dryers to obviate this trouble. Though the writers have not had opportunity to test this treatment, they feel that the bicarbonate solution offers a much simpler treatment; it dries readily, is free from the alkaline reaction of borax and in addition costs very much less.

While it is true that the necessity for the application of any preventive or prophylactic solution such as bicarbonate of soda or borax, is a serious drawback to the use of a substance as an accelerator, it does not prohibit its use. It offers a better solution of the difficulty certainly than that offered by the Committee on Accelerators. "Change of occupation," with the entailed loss of wages and curtailed production, can scarcely be considered a satisfactory antidote, either from the standpoint of the employe or employer.

The use of the bicarbonate solution is attended with no disagreeable results. When first applied to a severe case there is considerable smarting, but this soon stops after the solution has dried and the patients report that the severe itching which always accompanies this rash is relieved within a few hours, and there is a marked improvement in the appearance of the skin after twenty-four hours. The solution can be applied to the face and neck and even around the eyes with perfect safety. This is of particular importance, as some of the most severe cases are those in which the face, especially around the eyes, is affected. A case which recently came within the observation of the writers was that of a man whose entire face was inflamed to such an extent that both eyes were completely closed. Not only was the face affected, but also the arms, shoulders and legs. This case was so severe that it was found necessary to put the patient to bed. Four hours after the first application the inflammation had subsided, the patient stated that the itching sensation was practically gone and he was able to partially open his eyes. At the end of ten hours he was quite comfortable and slept through the entire night. This was quite remarkable for those suffering from the rash complain chiefly of being kept awake at night. Thirty hours after the first treatment he had sufficiently recovered to be discharged from the hospital.

Though the bicarbonate has an apparent curative effect, it is unquestionably chiefly preventive. The case just cited seems to contradict this, but the writers feel that the curative action was simply due to arresting the further action of the absorbed hexamethylene-tetramine. The chief interest in this treatment is the fact that further development of new rash is prevented, and the old rash is thus allowed to heal without further infection.

These observations are published with the realization that they represent the action of bicarbonate on a comparatively small number of cases, but the results seem to justify the conclusion that bicarbonate can be successfully used in controlling the hexamethylene-tetramine rash.

In presenting this paper the writers wish to acknowledge their appreciation of the cooperation of both Dr. D. V. McDonald, medical director, and John Young, chief chemist, of the Firestone Tire & Rubber Co.

WESTINGHOUSE WAR MEMORIAL SCHOLARSHIPS AWARDED.

The four annual War Memorial Scholarship awards of $500 each, established by the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, have been announced. The following men were successful: Herbert S. Pahren, Cincinnati, Ohio, order clerk in the Cincinnati office, who has selected for his scholarship a technical engineering course at the University of Wisconsin; Arthur Marthens, East Pittsburgh, Pennsylvania, of the cost department, who has chosen a course in electrical engineering at the Carnegie Institute of Technology; Paul O. Langguth, draftsman in the engineering department at East Pittsbugh, who has selected as his award an electrical engineering course at the University of Pittsburgh, and Andrew P. Lesniak, of the production department at East Pittsburgh, who has selected a course in mechanical engineering at the University of Pittsburgh.

Two classes of scholarships are provided by the Westinghouse company:

(a) For sons of employes of the company or its subsidiaries who have been employed for five years or longer.

(b) For employes of the company and its subsidiaries who have been continuously employed for at least two years and who shall not, on September 1, have exceeded the age of 23. Not more than two class B scholarships will be awarded in any year.

Each scholarship carries with it an annual payment of $500 for a period not to exceed four years, the payment to be applied toward an engineering education in any technical school or college selected by the successful candidate with the approval of the scholarship committee.

These scholarships have been established as a memorial to those employes of the company and its subsidiaries who entered the service of their country during the war. Four awards will be made each year.

UNITED STATES PRODUCTION OF BARYTES.

The crude barytes produced and marketed in the United States in 1918 was 155,241 short tons, one-fourth less than the quantity marketed in 1917, and one-third less than that marketed in 1916, according to statistics collected by the United States Geological Survey, Department of the Interior. The average price per ton was $6.73, as against $5.66 in 1917 and $4.56 in 1916.

Job Analysis and Written Standard Practice.

By James Wright Cary.

It used to be said that many a manufacturer had no reliable data concerning costs. This was doubtless true to a certain extent, and perhaps is now, owing to the fact that some managers have failed to appreciate the exacting requirements of a dependable cost department. This has been especially true of new concerns, frequently composed of men who had left old established institutions, to "set up" in business for themselves, and who "carried over" data considered "near enough" to afford a working basis.

OBJECTIONABLE PIECE RATE PRACTICES.

Many such firms endeavored to institute a "cost department," making time studies of all operations, and setting piece rates. Where the method employed was crude, the results were unsatisfactory. Usually this worked out so the employe could not make a "living wage," and again he made more than the management was satisfied the work was worth. To adjust this the rate was sometimes cut down to what it was thought the workman should be allowed to earn. This practice bore the usual fruit, and distrust, dissatisfaction and inharmony established themselves in place of those conditions that are essential to the perfect working of any manufacturing establishment.

So many manufacturers committed themselves to this unscientific way of establishing piece rates, that the very term became a stench in the nostrils of the average workman, and so remains to-day in many localities. This attitude of the worker was fostered by labor organizations, and it is only of recent date that they have softened to any noticeable degree in their hostility to any factory practice that includes the use of the stop-watch and time studies as a means for arriving at a wage rate. It did not take long for a manufacturer to discover that while "setting a piece rate" was, perhaps, easy enough—in fact too easy—it was commercial suicide to "cut it down," and there are some who have been wise enough to "let the rate stand," no matter how much a workman earned, and take the load on their own shoulders where it belongs.

SCIENTIFIC TIME STUDY THE SOLUTION.

This leads, naturally, to consideration of the question: Is there a scientific way of determining just what a man or machine should produce in a given time, and thereby establishing a wage rate that will be just to workman and manufacturer alike? Scientific time study can be secured by means of written standard practice, but a distinction must be made between "standard" practice, and the experimental studies that ordinaarily determine what the standard really is. Standard, therefore, is something scientifically proved.

BENCH JOB ANALYSIS.

To standardize an operation, calls for job analysis, and to analyze an operation, all the factors that enter into or effect it must be considered. Here are a few of them: consider location of workman or bench as to light, ventilation, temperature, conveniences, receipt and delivery of material, his bench, its dimensions, slope or tilt and height as adjustable to his own. Is its arrangement suited to the job; are there racks or holders for tools; are tools properly placed during work, or does operator have to reach for them; has he complete equipment, or does he have to borrow or lend? Enumerate tools and describe them. Are they made especially for this work, or selected from standard makes of knives, scissors, wrenches, hammers, nippers, etc., and simply utilized as far as they will go for this work; are they too heavy, or clumsy; do they "fit" the hand? While in use are they dropped upon the bench "hit or miss" to be fumbled for when again required, or are they placed in a rack? Is light ample in source, quality and quantity? Is any part of the work in shadow at any time? Is the light so strong as to affect the eyes? If so, does operator wear shade, colored glasses, goggles to protect from dust or particles? Does operator stand or sit while working? If former, is standing necessary to proper production? Is work tiring? If so in what way, and to what extent? Is there an allowance for fatigue; rest periods; rest rooms? If operator can sit at option, is stool or seat adjustable to height of bench or person; is seat large enough; does it interfere with quantity or quality of work produced? Toilet and drinking facilities: are they sanitary, modern? Interference: consider elements that might interfere with maximum production; tools, bench, light, conveniences as above enumerated. Work in process: are materials supplied to operatives, or do they go for them, or wait for them? What is the length of round trip; what time do trips require? If work is delayed for any cause, give actual time involved and production lost, and calculate the loss over a given period.

MAKING RECOMMENDATIONS.

If machine operation is under consideration, a proper job analysis would note light, ventilation, temperature, conveniences, safety appliances, receipt and delivery of material, sequence in routing. Describe the machine, giving particularly details essential to parts prominent in its operation. Its "make," registered number, floor space occupied, power used, size of pulleys, belt, shafting, speeds, units of production per day or hour as now operated. Consider the personnel: number of workmen; their duties. Analyze the peculiar adaptibility of each to his share of the job: size, weight, temperament, experience. Analyze the group as a whole in their efficiency. What changes would you make to secure best results, in the machine, service, management? Interference: consider elements that interfere with efficient operation: the machine itself; make, year made; is it up to present-day standards, or has it been superseded by lated models? If so, in what way and to what extent? Enumerate and describe advantages in exchanging old for new. Show in what way, and how soon, such changes would pay for themselves. Consider method of service: is production curtailed on account of poor routing, defective material, non-delivery of supplies, lack of efficient care of machine? Consider factors in operation: is foreman equal to requirements; number of men married, single, native, foreign; give nationalities. Attitude of foreman to job, to factory, toward his men. How are they paid: day-work, piece-work, bonus? Is the compensation adequate to the character of the job? Are men contented? If not, give reasons. Are toilet conveniences close by; adequate? Is light abundant for the work; ventilation and drinking water what they should be? Do operatives sit or stand at their work? If they sit are the seats of right height, size, construction? Is work exhausting? If so, what provision is made for rest periods; how often, how long? Show in detail the effect on production without rest, and the result with periods of rest. Recreation: provisions for recreation. Is there a circulating library; day or night school; recreation hall; music, such as an orchestra or band; athletic club, factory restaurant, hospital and dispensary, smoking room? To what extent, if any, do the men on the job under examination avail themselves of these advantages? Give particulars as to individuals.

MAKING RECOMMENDATIONS.

The above gives an idea of what constitutes job analysis. It would be modified or elaborated to suit requirements or the specific ideas of the analyist. Having written up the history of a

job, the investigator presents his recommendations. Naturally he must be prepared to back them up, and in all probability give a practical demonstration of their value before the average management will be convinced that the new method is better than the old. Fortunate indeed is he whose recommendations call for changes in method rather than in machinery. Changes or additions in machinery involving large expenditure have to run the gauntlet of service criticism. Such authorities as Taylor, Gannt, Emerson, Thompson, Diemer and Lichtner, however, could be induced to give a manufacturing proposition their attention on no other basis than that their recommendations be immediately carried out. Their attitude toward every proposition is the scientific one. To be scientific a process must be perfected, otherwise making time studies and setting piece-work rates thereon accomplish but one-half, and the less important half, of what should be attained.

Assuming that the management stands ready to make all changes necessary to secure production according to the highest standard obtainable, the result will be seen in machines that run at proper speeds, that are properly placed, efficiently served, and can be made to produce at the minimum of cost. Studies then made to determine piece rates, if made by an engineer properly qualified for the task, will be dependable, and the facts thus secured will furnish a proper basis and the only one for "Written Standard Practice."

INSTRUCTION CARDS.

Having evolved a "standard," the next step is to put it in writing. Preferably, heavy paper or cardboard should be used and kept in a convenient file for ready reference. In conjunction therewith an instruction card is issued for the guidance of the worker. It should prescribe the tools to be used, the time established as standard for each step in the sequence of production, and the rate of pay. A drawing or photograph of the article, with dimensions, would be a valuable addition, together with all directions necessary to a thorough understanding of the work to be done. In standard practice, instruction cards are issued that they may be conformed to in all particulars, and where the article to be made is new, or the method has been changed, their proper use presupposes the special training of the worker by an instructor.

THE OBSERVER AND HIS TASK.

An observer "properly qualified for the task" is vital to the success of any plan for establishing a "written standard practice" that is worthy the name. To quote from Gannt's "Work, Wages and Profit," "Stop-watch observations done inefficiently, or with ill-adapted appliances, or by poor methods, are absurd, and serve only to bring into disrepute all work in which the stop-watch is used. Moreover, such use of the stop-watch justly excites the contempt and opposition of the workman."

First of all, the investigator should be a diplomat. His attitude toward the workman should be devoid alike of patronage or servility. He should appreciate fully the dignity and the importance of his position. He should seek, first, to secure the good will of all. Naturally he must be capable, through study and training, to make a dependable report of conditions as he finds them, backed by recommendations that will appeal alike to the workers and the management as covering changes or improvements that will work out to the distinct advantage of all.

SECURING THE COOPERATION OF THE WORKER.

If workmen have been paid by the hour, and are known to be hostile to the term "piece work," why make use of it? The declaration that the rate per hour for all sorts of work will remain undisturbed, would at once dispel any latent suspicion that the "time study man" had for his ultimate object the "cutting down" of wages. In short, it is hard to conceive of scientific management in any real sense that has not for its ultimate object the establishing of conditions that would make it possible for the average worker to increase his earnings, conjointly with an increase in factory output. That is exactly what written standard practice, scientifically, projected, would secure. Given improvements in machinery and process, how then to secure the interest and cooperation of the workers? By the introduction of incentives toward greater individual interest in the job, the department, the shop. Past records show the average daily production. Pay a substantial premium or bonus in addition to the established daily wage. Create by degrees a class of high-grade workmen, setting aside a part of the factory, where practicable, in which they would work together. This would be applicable in shoe making, tire building and other work where a large number of operatives are engaged in making some one article or performing identical tasks. Place membership in this class on so high a plane that none but the most competent may attain to it, and make their reward so large that the average man or woman will be eternally striving for admission to it. Go a step farther; give an additional bonus to all who produce nothing but first-quality goods in a given period. Do not forget the foreman. Give him a bonus for each member in his department who earns one, and a special bonus when all his workmen make a perfect score.

CHILE DEMANDING AMERICAN TIRES.

Chile is rapidly becoming a good market for American automobiles and more especially for American tires. The people have made a great deal of money during the war and the well-to-do are substituting motor cars for their carriages in the cities, to which automobiles are largely restricted owing to poor roads in Chile, which people of moderate means have discovered the conveniences of certain low-priced American cars.

The growth of United States exports to Chile has been phenomenal; in the fiscal year ended June 30, 1913, they were 78 cars, valued $109,982, and $2,844 worth of tires; in 1918 the figures were 220 trucks, valued $282,638, with 3,390 passenger cars, valued $3,576,511, and tires worth $725,876, while for the fiscal year 1917-1918, owing to war conditions, the number of cars sank to 152 trucks, valued $223,733, and 1,057 passenger cars, valued $1,606,758 and the value of tires exported rose to $1,130,873. This is due largely to the fact that the bad roads in Chile are very hard on tires. In 1913 the United States had 8 per cent of Chile's automobile trade. In 1917 its share was 95 per cent.

The largest portion of the imports go to Valparaiso, whence many are sent to Santiago and the interior, but the imports to Talcahuno, to Antofogasta and Iquique in the nitrate region and Punta Arenas at the southern point of the continent are also considerable.

UNITED STATES PARCEL POST TO DUTCH EAST INDIES AND ZANZIBAR.

Parcel post service is now in operation between the United States and the islands of the Netherlands East Indies producing rubber and gutta percha. The list of islands given out by the post office is: Bali, Banca, Billiton, Dutch Borneo, Celebes, Little Sunda, Madura, the Moluccas, Rioce, Sumatra, Dutch Timor and Dutch New Guinea.

With the outlet of Uganda, also Zanzibar and the neighboring island Pemba, there is now parcel post service, but parcels will be delivered only in the towns of Zanzibar, Chaki-Chuki, and Weti, on Pemba island.

Imports of Manufactured Rubber Goods for Greece and the islands of the Archipelago amount to about $200,000 a year. This used to come from Germany, but is now in the hands of French and British dealers, including about $30,000 worth of belting and $40,000 worth of tubing of all kinds; the rest is made up of waterproof rubber shoes, pneumatic tires and air cushions.

Vulcanization by the Use of the Sulphur Reaction Product of a Nitrogen Accelerator.

British Patent No. 130,857, recently granted, covers vulcanization of rubber by the use of the sulphur reaction product of a nitrogen accelerator.

The specification states that in the curing of rubber no practical or commercial product has ever been produced from the reaction of sulphur with caoutchouc without the aid of a nitrogen-containing body present during vulcanization. This nitrogenous body may be found in natural rubber or may be added in the process of manufacture. The absence of all nitrogen, however, gives a vulcanization product that is of no value commercially. It has been the practice to add to the rubber before vulcanization certain nitrogen bodies (accelerators), which appear to have the effect of shortening the time required to cure the product and to improve its properties.

It has been found that these nitrogen accelerators are not usually the ultimate bodies which assist in the vulcanization of caoutchouc, but that they must first react with sulphur and that the sulphur reaction product thus formed is the agent which either aids or is entirely responsible for the satisfactory vulcanization of the rubber with sulphur.

Although this principle is believed not to have been recognized heretofore, a specific example has been proposed, namely the use separately as accelerating substances, of liquid and solid products of the interaction beween paranitroso-dimethyl-aniline or any of its homologs, and sulphur. The use of these particular accelerating substances is excluded from the present invention.

Vulcanization of rubber under this invention is divided into two distinct steps: first, the production of a sulphur reaction product of a nitrogen accelerator, and second, vulcanization proper, the reaction product being incorporated in the mix. A number of advantages result. For example, the temperatures used in vulcanization of caoutchouc are only occasionally and by merest coincidence, those most suitable for a reaction between sulphur and a nitrogen accelerator. In some cases, as in the use of hexamethylene-tetramine, the reaction with sulphur is violent, and produces large volumes of gas including hydrogen sulphide and other malodorous compounds, resulting in the formation of a vulcanized product which is often porous and bad smelling. In other instances the temperature of vulcanization is not sufficiently high to cause satisfactory reaction between the nitrogen accelerator and the sulphur and the accelerating effect is partly or wholly unattained. For example, carbanilide is almost inactive at the temperature corresponding to 40 pounds of steam pressure (141.4 degrees C.) while at 60 to 80 pounds pressure (153 to 162 degrees C.) it shows very valuable qualities.

By carrying out the reaction between the nitrogen accelerator and the sulphur before compounding them with rubber, the exact temperature best suited to this particular reaction may be employed and all undesirable by-product be removed before the finished reaction product is introduced into the rubber mixing. In many cases the curing value referred to the nitrogen content is more than doubled by using the sulphur reaction product of a nitrogen accelerator instead of the nitrogen accelerator itself.

A mixture by parts of sulphur 1, zinc oxide 16, and plantation pale crêpe rubber 16, cures to the best product in from 2½ to 2¾ hours at 141 degrees C. The addition of two parts of anhydro-formaldehyde-aniline (methylene-aniline) shortens the cure to about 45 minutes.

This accelerator when caused to react with aniline and sulphur forms a sulphur-nitrogen compound 1¼ parts of which used in place of the anhydro-formaldehyde-aniline in the above mix, shortens the time of cure to 20 minutes. This shortened cure benefits the product as evidenced by higher tensile strength and higher modulus of elasticity.

By anhydro-formaldehyde-aniline (methylene-aniline) is meant the reaction product of two molecules of formaldehyde on two molecules of aniline, giving two molecules of methylene-aniline which polymerizes and may be conveniently considered a dipolymer.

EXAMPLE I.

The preferred method for producing this sulphur-nitrogen accelerator is as follows: 210 parts (one molecule) methylene-aniline and aniline are boiled under a reflux condenser for five hours at 195 to 198 degrees C. (thermometer in the liquid). The mixture is then cooled to 150 degrees C. at which point the sulphur is added. The temperature is next raised slowly to 175 degrees C. and held until 56 to 60 parts by weight (about two molecules) of hydrogen sulphide are lost. The free aniline is distilled off by steam distillation, care being taken to remove the aniline from the reaction mixture to such an extent that the product will cool to a hard brittle mass.

Thiocarbanilide or methylene-diphenyldiamine may be substituted in the foregoing example with the proper precautions and a similar product may be produced having a higher curing power than the original base. The reaction products thus obtained when dried are suitable for use in rubber mixings and show many advantageous properties as accelerators.

EXAMPLE II.

Methylene-diphenyldiamine 198 parts (one molecule); sulphur 64 parts. These ingredients are slowly melted and heated to 120 to 150 degrees C. until 34 to 36 parts (one molecule) of hydrogen sulphide has been removed. The reaction product is then steam-distilled, removing about 93 parts (one molecule) of aniline which has been produced during the reaction.

EXAMPLE III.

Methylene-aniline, 210 parts (one molecule of di-polymer); sulphur, 64 parts. The ingredients are slowly melted and then heated to 150 to 170 degrees C. until 34 parts (one molecule) of hydrogen sulphide are removed.

There is also produced some carbon di-sulphide, which may be estimated by absorption in aniline and allowed for, although this is not necessary. The product is then steam-distilled until no more aniline will come over.

EXAMPLE IV.

Straight sulphur reaction on tri-phenyl-guanidine; 287 parts tri-phenyl-guanidine; 64 parts sulphur. The mixture is heated to 225 degrees C. under reflux until 34 parts (one molecule) hydrogen sulphide is lost. The compound on cooling is ground and compounded with rubber and has the same curing power, nitrogen for nitrogen, as tri-phenyl-guanidine itself.

EXAMPLE V.

Sulphur on tri-phenyl-guanidine with 287 parts tri-phenyl-guanidine; 186 parts aniline; 64 parts sulphur. The mixture is heated gradually to 236 degrees C. until 34 parts of hydrogen sulphide has been removed. In order to raise the temperature the aniline must be partially distilled off with a simultaneous evolution of gas. When the aniline removed equals 186 parts, or nearly so, and the hydrogen sulphide has reached or passed 34 parts, the reaction is complete, and on cooling is found to be a hard reddish-brown resin having a concoidal fracture. It is equal in curing power to tri-phenyl-guanidine.

The term "nitrogen accelerators" is intended to include, with the exceptions cited above, all of those nitrogen-containing bodies

the properties of which are such that they tend to react with sulphur in a rubber mixing as the result of which vulcanization is effected or expedited. Many substances are inherently accelerators in this sense which would not be so regarded at present because their accelerating effect cannot be obtained under the temperature and other limitations of the curing process itself

In addition to amino bodies, secondary amines and imines, such as the specific nitrogen accelerators above mentioned, nitroso bodies, except paranitroso-dimethyl-aniline and its homologs, cyanide bodies, such as sodium ferrocyanide, and proteids and the products of their decomposition and hydrolysis, including the amino acids, and such, for instance, as animal glue or gelatine, give good results when employed according to this process.

Although in some respects advantageous to limit the amount of sulphur to that required for reaction with the nitrogen accelerator, it is permissible to admix with the nitrogen accelerator the entire amount of sulphur to be used for vulcanization. With the exception of a few above mentioned compounds, the nitrogen-containing bodies used contain the amino group or a substituted amino group.

Rubber Tariffs of North America.

MANUFACTURED RUBBER GOODS were exported in 1918 from the United States to the other countries of North America, Canada and the British Colonies, Mexico, the Central American States, Cuba and the other West Indian Islands to the amount of $10,417,390, showing the same steady increase that marked each year of the war. The change from the fiscal year, beginning July 1 and ending June 30, to the calendar year beginning January 1 and ending December 31, renders the necessary comparisons a little awkward, for the 1918 figures are identical for six months with those for the fiscal year 1917-18. The exports in that period were $9,707,020 which was over a million and a half more than the $7,994,805 of 1916-17 and that exceeded by much more than two millions the $5,664,173 of 1915-16, which in turn was nearly a million and a half more than the $3,257,865 of 1914-15, the first year of the European war.

That figure was a little below the fairly steady average of the previous years which was something under four million dollars a year.

The chief customer of the United States in all the lines save tires was Canada which took $4,734,351 of rubber goods; Cuba was next with $2,486,104 and Mexico, third, with $1,715,559; far behind followed Panama with $287,286, Jamaica with $165,657, the Dominican Republic with $145,007, while the Danish West Indies, which now belong to the United States, bring up the rear with $14,427.

Automobile tires form the largest item of the exports, $4,422,020; of these Cuba took $1,454,090, Canada, $1,278,000, and Mexico, $999,569. For belting and hose of which $1,552,974 was exported, Canada leads among the purchasers with $511,381; Mexico is next with $459,325; and Cuba, third, with $386,069.

Druggists' rubber sundries appear in the list for the first time in 1918, when they were exported to the amount of $412,801; previously they had been included among "other manufactures" of rubber which, with them, made up a total of $2,815,326. Rubber boots and shoes combined were sold to the amount of 760,041 pairs worth $1,358,372; for these Canada was by far the best customer, taking over $900,000 worth with Newfoundland next with $250,000; the southern countries had no call for goloshes.

The succeeding extracts from the tariffs of the principal countries of North America show the competition to which rubber manufacturers of the United States are subject under existing tariff conditions. Owing to frequent tariff changes the figures and information given below should be periodically verified and small trial shipments made to test the rates:

UNITED STATES EXPORTS OF RUBBER GOODS TO NORTH AMERICA—1913-1918.

EXPORTED TO—	Belting, Hose, and Packing	Boots		Shoes		Druggists' Rubber Sundries.	Tires		All Other Rubber Manufactures.	Totals.
	Value.	Pairs.	Value.	Pairs.	Value.	Value.	Automobile. Value.	All Others. Value.	Value.	Value.
NORTH AMERICA										
Bermuda	$956	21	$114	918	$1,144	$1,042	$200	$565	$2,278	$6,299
British Honduras	389	......	......	25,484	24,284	855	4,882	666	1,099	32,175
Canada	511,381	57,513	189,566	318,919	722,994	235,394	1,278,000	66,452	1,730,564	4,734,351
Central American States										
Costa Rica	6,667	......	......	96	76	77	5,851	61	2,690	16,357
Guatemala	7,755	......	......	2,075	2,195	3,766	20,073	888	7,761	42,438
Honduras	11,463	66	146	14,713	11,645	1,452	22,014	1,564	2,623	50,907
Nicaragua	7,858	......	......	5,037	5,098	1,195	3,448	226	11,970	30,395
Panama	79,545	6,146	7,177	31,695	29,080	5,886	117,442	14,064	34,092	287,286
Salvador	7,577	......	......	......	......	1,136	26,848	349	20,448	56,358
Mexico	459,325	196	1,081	24,664	23,992	53,225	999,569	50,769	127,598	1,715,559
Miquelon, Langley, etc.	35	2,196	7,095	1,165	748	31	......	......	616	8,525
Newfoundland and Labrador	26,783	40,189	125,243	128,866	124,214	2,296	15,212	451	24,326	318,519
West Indies—										
British—										
Barbados	1,896	6	42	1,883	1,829	1,336	30,435	1,656	3,061	40,255
Jamaica	8,424	......	......	1,499	1,762	2,978	129,825	12,814	9,854	165,657
Trinidad and Tobago	8,618	......	......	3,087	2,123	5,438	90,862	1,512	8,178	116,731
Other British	2,961	24	38	4,738	3,829	1,641	29,100	1,349	2,182	41,100
Cuba	386,069	1,391	1,888	83,593	65,922	88,561	1,454,090	103,071	386,503	2,486,104
Danish (Virgin Islands, the United States)	1,182	......	......	731	878	447	10,020	197	1,703	14,427
Dominican Republic	17,894	......	......	1,792	2,162	4,364	95,511	7,159	17,917	145,007
Dutch	831	......	......	453	462	518	13,515	153	1,414	16,883
French	2,611	......	......	688	695	42	47,684	1,661	2,443	54,536
Haiti	3,354	1	6	193	304	426	27,439	2,831	[illegible]	37,571
*TOTALS, NORTH AMERICA	$1,552,974	107,752	$332,396	652,289	$1,025,976	$412,801	$4,422,020	$268,698	$2,402,525	$10,417,390
Fiscal year, 1917-18	$1,529,170	$147,710	$415,174	418,946	$381,355	$408,220	$4,474,713	$306,435	$2,191,951	$9,707,020
Fiscal year, 1916-17	1,171,463	116,695	303,635	312,128	231,320	....	3,186,265	362,547	2,729,575	7,994,805
Fiscal year, 1915-16	837,147	59,878	154,923	163,234	113,365	....	2,184,874	265,833	2,108,031	5,664,173
Fiscal year, 1914-15	627,696	39,087	104,100	119,337	75,357	....	1,187,632	146,186	1,116,894	3,257,865
Fiscal year, 1913-14	923,941	42,712	124,121	135,952	82,899	....	1,254,200	168,128	1,276,084	3,829,373
Fiscal year, 1912-13	1,328,305	24,881	80,939	146,927	86,219	....	1,626,155	197,530	1,508,032	4,827,180

*Calendar year 1918.

BERMUDA.

Equivalents.—Pound Sterling, normally $4.86.

All goods, with a few exceptions consisting of liquors, spirits, tobacco and manufactures thereof, live stock, agricultural products and provisions, meat, patent medicines, creams and lotions, are liable to import duty of 10 per cent ad valorem. In addition to this duty, a surtax is leviable equal to 10 per cent on the amount of duty payable.

Goods imported on account of the local government by any officer or committee, being the property of the public or purchased at public expense, are exempt. Fire engines and all other articles imported by the Corporation of Hamilton, as part of the equipment of the Hamilton fire brigade are also exempt.

Persons exporting goods are entitled on certain conditions to the whole of the duty paid on the importation thereof when the duty on said goods amounts to £2.

Drawbacks of duties are allowed for goods sold to and becoming the property of His Majesty's Government.

BRITISH HONDURAS.

Equivalents.—The dollar, equal to the American dollar, is the monetary unit

All goods, excepting certain articles of food, aerated waters, liquors, spirits, tobacco and manufactures, explosives, arms and ammunition, jewelry, lumber, certain oils, opium, perfumery, phonographs and similar articles, are liable to import duty of 15 per cent ad valorem, including the cost of packages in which they are packed.

Fire extinguishing apparatus, accessories and appliances, are duty free, as are also machinery—agricultural, electrical, marine, mining and manufacturing or parts thereof, including boilers, belting, steam pipes, packing, lagging, fittings, batteries and charges. Unmanufactured rubber is exempt from duty; on chicle there is an export duty of ½ cent per pound.

CANADA.

Equivalents.—N. o. p. represents the words "not otherwise provided for." "Per cent" represents per centum ad valorem.

Tariff No.		British Preferential Tariff. Per Cent.	Intermediate Tariff. Per Cent.	General Tariff. Per Cent.
	CRUDE RUBBER, ETC.			
254.	Chicle and Pontianak gums....	5	7½	7½
616.	Rubber and gutta percha, crude caoutchouc or india rubber, unmanufactured, powdered rubber and rubber or gutta percha waste....	5	7½	7½
616a.	Crude balata	Free	Free	Free
	PASTES.			
618.	Rubber cement	20	32½	35
	BOOTS AND SHOES.			
617.	India rubber boots and shoes..........	20	30	32½
	TIRES.			
592.	Tires of rubber for vehicles of all kinds, fitted or not.................	27½	37½	42½
	OTHER GOODS.			
407.	Wire, single or several, covered with cotton, linen, silk, rubber or other material, including cable so covered....	25	35	37½
562.	Oiled silk and oiled cloth, and tape or other textile, rubbered, flocked or coated, n. o. p......................	25	35	37½
569.	Stockinettes for the manufacture of rubber boots and shoes, when imported by manufacturers of rubber boots and shoes, for use exclusively in the manufacture of such articles in their own factories............	15	20	22½
616.	Hard rubber in sheets, but not further manufactured and recovered rubber and rubber substitute...............	5	7½	7½
618.	All manufactures of india rubber and gutta percha, n. o. p...............	20	32½	35
619.	India rubber clothing and clothing waterproofed with rubber; rubber or gutta percha hose, and cotton or linen hose lined with rubber: rubber mats or matting and rubber packing.	27½	37½	42½
620.	Elastic webbing, over one inch wide...	17½	25	27½
676.	Rubber bulbs, for vaccine points, when imported by manufacturers, for use exclusively in the manufacture of such articles in their own factory...	Free	Free	Free
683.	Filets of cotton and rubber not exceeding 7 inches wide, when imported by manufacturers of card clothing..	5	7½	7½
684.	Rubber thread, not covered...........	5	7½	7½
742.	Hard rubber, unfinished, in tubes, for use only in the manufacture of fountain pens, when imported by manufacturers of such pens.........	10	15	17½
747.	Paper and materials of paper, gutta percha, imitation rubber, imported by manufacturers of music rolls, for use only in their own factories..........	5	7½	7½
755.	Hard rubber, in strips or rods, but not further manufactured, when for use in Canadian manufactories	5	7½	7½

The rates of customs duties, set forth in column 1, "British Preferential Tariff," apply to goods the produce or manufacture of most British colonies and professions when imported direct from any British country. Crude rubber and balata imported from the West Indies into Canada come under the preferential tariff.

Certain French, Dutch, and Belgian goods enjoy the benefits of the intermediate tariff, among which are:

Tariff No.	
618.	Rubber cement and all manufactures of india rubber, n. o. p.

COSTA RICA.

Equivalents.—Gold colon, 45 cents: kilo, 2.2. pounds.

Tariff No.		Duty per Kilo in Colons.
	CRUDE RUBBER.	
57.	Crude rubber	0.06
	PASTES.	
59.	Liquid or cement for repairing tires......................	0.20
	BELTING, HOSE, AND PACKING.	
57.	Machine belting of rubber..............................	0.06
58.	Machine packing of rubber..............................	0.10
58.	Water pipes and hose of rubber.........................	0.10
	BOOTS AND SHOES.	
62.	Garters, shoes, boots, heels.............................	1.00
	TIRES.	
59.	Wheels for coaches and carriages with rubber tires........	0.20
59.	Rubber tires for carriages, automobiles and other vehicles...	0.20
	DRUGGISTS' SUNDRIES.	
62.	Bed sheets, mattresses, life belts, cushions, nipples, injectors, bottle stoppers, pipes, and all other articles of rubber or gutta percha, n. o. s., and not ornamented......	1.00
94.	Trusses, suspensory bandages, pessaries, bougies, probes, elastic stockings, abdominal belts and other unenumerated appliances and apparatus for surgical purposes......	1.00
	OTHER GOODS.	
46.	Elastics for footwear..................................	2.50
48.	Elastics, garters, braces...............................	5.50
59.	Paving slabs of rubber.................................	0.20
60.	Foot-wipers and similar articles of rubber and cork........	0.40
62.	All kinds of rubber toys, made up waterproofs or capes of gutta percha and rubber on or in combination with wool, or wool and cotton, vaporizers, stoppers, rubber seals and letters	1.00
63.	Ornamental wares of less than 2 kilos, in weight of rubber or indurated gums, fountain pens.......................	2.00

The duties are payable on gross weight, if the tariff provides that the goods are chargeable on weight without any deductions for packing receptacle. If the receptacle is liable to a higher rate of duty than its contents, it shall be assessed separately. Importd goods shall pay inclusive of all duties, the rates leviable thereon, under the tariff, besides the quay due of ½ centime per kilogramme. Goods which under contract or special laws are duty free, shall pay consular fees, except as to those which are expressly exempt from such fees.

Rubber is subject to an export duty of 10 per cent ad valorem.

GUATEMALA.

Equivalents.—Peso (100 centavos), 96 cents; kilo, 2.2 pounds.

Rubber goods are not specifically mentioned in the Guatemalan tariff. A decree of December 3, 1903, establishes a duty of 4 centavos per quintal (220 pounds) on goods removed from the Champerico custom house.

Among articles paying 11½ per cent ad valorem are mentioned pumps of iron with or without hose, for mines, fire-engines, or watering purposes.

On rubber, there is an export tax amounting to 10 pesos per quintal, gross weight.

HONDURAS.

Equivalents.—Silver peso (100 centavos), about 40 cents; kilo, 2.2 pounds.

Tariff No.		Duty Per Half Kilo in Pesos.
	CRUDE RUBBER.	
411.	Crude rubber	0.10
	BOOTS AND SHOES.	
255.	Top boots of rubber......................................	0.50
1650.	Boots and shoes of all kinds..............................	1.00
	TIRES.	
967.	Bicycle tires	0.50
	DRUGGISTS' SUNDRIES.	
83.	Air cushion	0.10
582.	Waterproof aprons	0.50
895.	Rubber syringes	0.30
1042.	Rubber stockings	0.50
1587.	Vaporizers	0.25
	OTHER GOODS.	
171.	Rubber buckets	0.25
412.	Rubber manufactured into articles not specified............	0.50
610.	Boots, elastic	0.25
792.	Rubber manufactured into articles not specified............	0.25
829.	Gutta percha manufactured into articles not specified........	0.25
946.	Garters	1.00
1268.	Waterproof ponchos	0.35
1190.	Balls	0.25
1403.	Rubber stamps and accessories............................	0.25
1477.	Rubber stoppers	0.20
1499.	Waterproof tissues, not specified.........................	0.50

Save in the case of wood for building purposes, all goods enumerated in the tariff of Honduras are assessed for duty on gross weight per half kilogram.

Importers have to pay for the cartage and stowage of goods a tax of 50 centavos per 100 kilos, which the customs shall levy at the time of passing each import entry.

Rubber, the produce of Honduras, shall pay an export duty of 3 pesos per quintal.

NICARAGUA.

Equivalents.—Peso (paper), about 17 cents; kilo, 2.2 pounds.

Tariff No.		Duty Per Kilo, in Pesos.
	CRUDE RUBBER, ETC.	
199	Crude rubber and gutta percha, in slabs and rolls	0.75
	BELTING.	
354	Machine belting of rubber	0.38
	BOOTS AND SHOES.	
346.	Footwear of rubber such as top boots and waterproof boots	1.13
90.	Footwear of all kinds, n. s., including gaiters and leggings, elastic boots, for men and children	1.80
91.	The same, for women	1.80
	DRUGGISTS' SUNDRIES.	
362.	Syringes and nipples	0.75
	OTHER GOODS.	
330.	Napkin rings and other domestic articles of rubber, gutta percha, etc.	1.50
349.	Manufactures of rubber not specified	1.13
350.	Masks of rubber, gutta percha, etc	1.50
846.	Cotton elastic tapes and cards for any use	0.98
862.	Cotton boot and shoe elastic	0.53
906.	Cotton elastic suspenders, garters, belts	1.50
1059.	Wool elastic ribbons	2.25
1061.	Woollen belts, sash, garters, suspenders, elastic or not	2.25
1071.	Woollen boot and shoe elastic	0.53
1130.	Silk elastic ribbons	4.50
1135.	Silk boot and shoe elastic	1.50
1142.	Silk garters, belts, suspenders, elastic or not	4.50
1484.	Bicycles and accessories	0.45
1548.	Cloaks and capes of rubbered cotton or linen tissue and similar articles for men and women	0.75
1549.	Cloaks, capes and similar articles of woolen or silk tissue, for men or women	2.25
1576.	Toy balloons	0.38
1613.	Dress shields	1.50
1618.	Stamps (seals) of all kinds	0.75
1625.	[1]Oil cloth, painted, varnished or prepared for partitions and flooring	0.19
1626.	[1]The same for carriages and table covers	0.38

A decree dated November 13, 1895, places a duty of four centavos on each pound of rubber exported from the Department of Zelaya, District of Siquia, region of Cape Gracias à Dios.

[1]Tariff Nos. 1625 and 1626 include cloth covered with rubber or varnish of rubber.

PANAMA.

Equivalents.—Balboa, 1 dollar; kilo, 2.2 pounds.

For the purpose of collecting duty, merchandise are divided into four classes:

1. Articles free from payment of the tax.

Among these articles are included machinery for the manufacture of rubber and articles imported by the local government.

2. All merchandise not specified in the first and third class will be divided into two groups, A, paying 10 per cent ad valorem, and B, paying 20 per cent ad valorem. To group A belong various kinds of provisions, oils, cement, barbed wire, hatchets and similar tools, books, printed matter not coming through the post, jute and hennequin bags.

All other articles belong to group B.

The 20 per cent on articles in group B will not become effective without taking into account that provided for in Article 121 of the Constitution, and after coming to an agreement with the Government of the United States in accordance with what is laid down by the Taft Convention.

3. Different kinds of spirits, alcoholic and soft drinks; passengers' baggage when its weight exceeds that established by this tariff.

SALVADOR.

Equivalents.—Peso, nominal value 96 cents; real value about 38 cents; kilo, 2.2 pounds.

Tariff Nos.		Duties Per Kilo in Pesos.
	CRUDE RUBBER.	
243.	Unmanufactured rubber	0.10
	BOOTS AND SHOES.	
246.	Boots, shoes, leggings	1.00
	BELTING, HOSE AND PACKING.	
242.	Rubber in belts or as packing	0.01
244.	Hose or water pipes	0.30
	DRUGGISTS' SUNDRIES.	
98.	Suspensories, trusses, all kinds of bandages, syringes, nursing bottles, breast pumps, cupping glasses	0.40
	OTHER GOODS.	
10.	Cotton elastic for shoes	0.35
32.	Woollen elastic for shoes	0.50
36.	Other woolen elastic bands	1.50
37.	Braces, garters, etc., of woolen elastic webbing	2.00
44.	Silk elastic for shoes	1.00
50.	Other silk elastic	3.00
54.	Linoleum and other fabrics coated with rubber or wax, for floors	0.30
55.	Unspecified cloth coated with wax or rubber for table or furniture covers, etc	0.40
243.	Rubber, for flooring	0.10
245.	Toys, jewelry and other unspecified articles	0.60
246.	Cloaks or other garments; dress-preservers, billiard cushions, cord for catapults, etc	1.00
314.	Flasks, covered with gutta percha	0.30

By a commercial convention between France and Salvador, France is entitled to the minimum tariff rates on rubber imported from Salvador.

Among French goods entering Salvador, unspecified articles of rubber pay a duty of 0.45 peso. This tariff is also applicable to Germany.

According to a law of April 4, 1911, there is an export tax on rubber amounting to 1.20 pesos per quintal, gross weight.

The import duties on all goods introduced into the ports of the Republic are increased by 30 per cent in American gold.

MEXICO.

Equivalents.—Silver peso, 49 cents; kilo, 2.2 pounds; n. s. m., not specially mentioned.

Tariff No.		Duties, Pesos
	BELTING, HOSE AND PACKING.	
654.	Rubber machinery belts, belts of tarred cotton or hemp ... *kilo*, gross	[illegible]
661.	Rubber hose, over 15 millimeters in external diameter, even combined with cloth ... *kilo*, legal	0.15
677.	All kinds of packing ... *kilo*, gross	0.05
	BOOTS AND SHOES.	
687.	Rubber footwear, also that containing cloth ... *kilo*, legal	1.00
	TIRES.	
633.	Rubber tires of all kinds for automobiles, even with parts of leather; inner tubes ... *kilo*, gross	0.75
	OTHER GOODS.	
352.	Elastics of cotton and rubber, over 4 centimeters wide ... *kilo*, legal	[illegible]
353.	Elastics of cotton and rubber, not over 4 centimeters wide ... *kilo*, legal	1.25
445.	Elastics of wool and rubber, over 4 centimeters wide ... *kilo*, legal	1.25
446.	Elastics of wool and rubber, not over 4 centimeters wide ... *kilo*, legal	[illegible]
504.	Elastics of rubber and silk (pure or mixed with other fibers), over 4 centimeters wide ... *kilo*, legal	3.00
505.	The same, up to 4 centimeters ... *kilo*, legal	5.00
652.	Articles n. s. m. of gutta percha, celluloid, rubber or rubbered cloth ... *kilo*, legal	0.60
684.	Rubber erasers, rubber tire cement ... *kilo*, legal	0.60
688.	Rubber in sheets, all kinds ... *kilo*, legal	0.12
689.	Dental rubber ... *kilo*, legal	4.00

An export duty of 6 per cent ad valorem is levied on guayule plants and other rubber-yielding plants (on rubber content), also a duty of 4 per cent ad valorem on guayule rubber.

By legal weight is understood the weight of the goods in the internal packing.

NEWFOUNDLAND.

Equivalents.—Dollar, same as United States dollar.

Tariff No.		Duty Rates, ad Valorem.
	BELTING AND HOSE.	
12.	Belting of leather or other material	10%
82.	Rubber or gutta percha hose, and cotton or linen hose lined with rubber or gutta percha	40%
	BOOTS AND SHOES.	
82.	India rubber boots and shoes	40%
	TIRES.	
32.	Rubber tires for carriages	20%
13.	Bicycles, tricycles and parts n. e. s	40%
	OTHER GOODS.	
54.	Diving apparatus	10%
82.	Rubber clothing and clothing made waterproof with rubber.	40%
82.	All other manufactures, in part or in whole, made of rubber or gutta percha	40%
131.	Elastic webbing; round and flat garter elastic	25%
134.	All kinds of rubber erasers	35%

Articles imported by the local government, charitable donations of clothing, etc., supplies, stores and donations for the Moravian missionaries on Labrador and for the Deep Sea mission (under such rules and regulations as may me made by the governor in council), are exempt from duty.

BARBADOS.

Equivalents.—Money and weights, same as Great Britain.

The general tariff places a duty of 11¼ per cent ad valorem on india rubber goods. The preferential tariff for Great Britain and British countries on the same articles is 9 per cent ad valorem.

All goods imported by the governor of the island or by the local government, are exempt, also machinery belting.

JAMAICA.

All goods, other than liquors, live stock, provisions, arms and ammunitions, lumber—which pay specified duties—and agricultural implements, tools, electrical and gas apparatus, bagging, printed matter; provisions, stores, etc., for government use, certain medicines, machinery, manufactures of metals, plants, educational articles—which are duty free—are liable to a duty of 10 per cent ad valorem.

TRINIDAD AND TOBAGO.

Manufactures of india rubber are subject under general tariff to a duty of 10 per cent ad valorem, while products of Great Britain and British countries enjoy a preferential tariff, which puts a duty of 8 per cent ad valorem on these goods.

Balata, crude rubber, and chicle are duty-free.

CUBA.

Equivalents.—Peso, 60 cents; kilo, 2.2 pounds.

Tariff No.		Duties in Dollars.
	CRUDE RUBBER, ETC.	
78c.	Rubber and gutta percha ... 100 *kilos*	3.00
	BOOTS AND SHOES.	
314a.	[2]Boots and shoes ... *kilo*	0.32½

TIRES.

227.	Solid and pneumatic tires for motorcycles and automobiles, and all other vehicles		25% ad valorem

OTHER GOODS.

309a.	[1]Hose and piston packing	kilo	0.05
314a.	[2]Waterproof, rubbered, cotton, tissues	kilo	0.32½
314.	[2]Waterproof fabrics, for raincoats	kilo	0.25
314b.	[2]Waterproof, rubbered silk and woolen fabrics for raincoats	kilo	0.65
309b.	[1]All other articles	kilo	0.20

[1]Twenty per cent tare allowance.
[2]Other waterproof fabrics for raincoats, *kilo*, 0.50.
Manufactures of articles under No. 314 shall be liable to a surtax of 30 per cent, except boots and shoes.

DOMINICAN REPUBLIC.

Equivalents.—The American gold dollar is the standard in force. Kilo, 2.2 pounds; g. w., gross weight; n. w., net weight.

CRUDE RUBBER, ETC.

Tariff No.			Duty Rates.
1093.	Crude rubber, waste and scrap (n. w.)	kilo	$0.20

BELTING, HOSE AND PACKING.

1093b.	[1]Packing, not in sheets, of rubber, pure or combined with any material, including piston packing, valve packing, etc.; and rings, discs, gaskets, washers (n. w.)	kilo	0.25
1693a.	Rubber or gutta percha in sheets, combined or not with other material for packing (n.w.)	kilo	$0.20
1093c.	Driving belts of rubber combined with other material, n. w.	kilo	0.30
466.	Hose of cotton or other fiber, combined with rubber, n. w.	kilo	0.10
1093d.	Hose of rubber combined with other materials (n. w.)	kilo	0.10

(The weight of hose fittings shall be included, if attached.)

BOOTS AND SHOES.

1094d.	Boots and shoes of rubber, combined or not with other material (n. w.)	kilo	0.25

TIRES.

1094a.	Rubber tires, combined or not with other matreial, and inner tubing, for all kinds of vehicles (n. w.)	kilo	0.80

DRUGGISTS' SUNDRIES.

237.	Ear trumpets and cupping glasses of rubber (n. w.)	kilo	2.00
1094e.	Water bottles, caps, syringes, ice and urinal bags (n. w.)	kilo	1.00
1094f.	Rubber nipples, fittings for nursing bottles, teething rings and similar articles (n. w.)	kilo	1.00
1095g.	Hard rubber syringes and syringe tips (n. w.)	kilo	2.50
1095.	Dental rubber (n. w.)	kilo	2.50

OTHER GOODS

302a.	Copper wire covered with rubber or other insulating material other than silk or wool (n. w)	kilo	0.30
458.	Cotton elastic bands up to 5 millimeters wide	100 meters	0.75
458a.	The same, wider, for each centimeter or fraction thereof in width	100 meters	1.50

(NOTE.—The same rate shall be applied to cotton elastic textiles manufactured with threads of rubber.)

459.	Elastic cotton suspenders	dozen	2.00
460.	Elastic cotton garters, arm bands	dozen pairs	0.60
	And in addition (n. w.)	kilo	0.60
461.	Other made up articles of cotton elastic fabric, bands, ribbons, tapes (n. w.)	kilo	2.50
468.	Waterproof textiles of rubber and cotton (n. w.)	kilo	0.30
469.	Ponchos and blankets of cotton and rubber fabric	dozen	8.00
470.	Coats, capes, overcoats of waterproof fabric of cotton and rubber	dozen	12.00
471.	Trousers of cotton rubber-waterproofed	dozen	5.50
472.	Hats, caps, headgear covers and similar small articles of waterproof cotton and rubber fabric	dozen	2.40

(NOTE.—Any articles in paragraphs 470, 471, 472, when of sizes suitable only for children's wear, shall pay 60 per cent of the duties provided for in said paragraphs.)

473.	Dress shields of cotton and rubber	dozen pairs	1.20
474.	Articles, n. e. s., made of textiles of rubber and cotton or cotton textiles waterproofed with rubber (n. w.)	kilo	0.45
1094.	Tubing of rubber or gutta percha, combined or not with other material, with or without accessories (n. w.)	kilo	0.60
1094b.	Rubber hat forms (n. w.)	kilo	0.60
1094c.	Mats and matting (n. w.)	kilo	0.25
1094g.	Rubber type and stamps (n. w)	kilo	1.50
1094h.	Rubber erasers (n. w.)	kilo	0.80
1094i.	All other articles of soft rubber not elsewhere mentioned (n. w.)	kilo	1.00
1095a.	Rulers of hard rubber combined with other material	dozen	0.50
	And in addition (n. w.)	kilo	1.00
1095b.	Hard rubber pen holders	dozen	0.50
	And in addition (n. w.)	kilo	1.00
1095c.	Fountain pens, with or without gold nibs and with parts or ornaments of gold, silver, mother-of-pearl, etc	dozen	12.00
1095d.	The same, with gold nibs and not ornamental	dozen	6.00
1095e.	The same, plain with other nibs and styles of hard rubber,	dozen	1.50
1095f.	Hard rubber trays for developing or other purposes (n. w.),	kilo	0.75
1095h.	Hard rubber cigar or cigarette holders, and mouth pieces for pipes (n. w.)	kilo	3.00
1095i.	Hard rubber combs and hair ornaments (n. w.)	kilo	2.00
1095j.	Other articles of hard rubber not specially mentioned (n. w.)	kilo	2.50

[1]Tare allowance 10 per cent.

ST. PIERRE AND MIQUELON.

Equivalent.—Franc, nominal value 20 cents; kilo, 2.2 pounds; n., net weight.

Tariff No.			Duties, Francs.
245.	India rubber, gutta percha and asbestos manufactures of any style, including clothing, made up or not	100 kilos n.	70.00
246.	Boots and shoes of rubber or rubbered tissues	100 kilos n.	40.00

HAITI.

Equivalents.—Gourde, 96½ cents; ell, 46.77 inches.

Tariff No.			Duties, Gourdes.
355.	Rubber slippers, or slippers with rubber soles	dozen pairs	0.75
413.	Mackintosh coats	each	1.00
555.	Garter elastics	ell	0.02
556.	Boot elastics	ell	0.04
710.	Erasers	dozen	0.05
1365.	Rubber stamps	each	0.10

The following surtaxes are levied on imports: 50 per cent., 33⅓ per cent, in gourdes, and 25 per cent in gold. A law of August 20, 1909, authorizes the government to levy a further surtax of 15 per cent on the aggregate import duties.

BRAZILIAN CONSULAR INVOICE RULING REVOKED.

The American Chamber of Commerce announces a successful outcome of its fight against the adoption of the Brazilian Consular Invoice Bill, which was to go into effect October 1. The ruling provided that consular invoices should contain a clear definition of the goods shipped, instead of general terms, as previously. Upon the adoption of this rule, general designations, such as "cotton goods, not specified," "chemical products, not specified," etc., would have been prohibited. The exporter of chemicals would have been obligated to specify each product by its scientific or commercial designation. It was required that the materials composing the article or entering into its manufacture be specified. In the case of textiles it would have been necessary to state the name of fibers or materials which entered into its fabrication, such has cotton, silks, linen, etc.

In short, the requirements of the proposed rule would have placed so great a burden on American exporters that it would have discouraged firms in developing their business with Brazil, and the thanks of the export trade are due the American Chamber of Commerce for its success in bringing about the annulment of this objectionable ruling..

AMERICA'S ANNUAL TIRE BILL $1,000,000,000.

In emphasizing the importance of more and better roads, M. O. Eldridge, director of roads of the American Automobile Association, states that forty million tires are required annually as equipment and renewals for the seven million passenger automobiles and motor trucks in use in the United States. At an average cost of $25 each the total annual expenditure for tires is $1,000,000,000. Hence it is high time to pay a little more attention to the effect of the various road surfaces on the motor vehicle instead of considering only the damage by the motor vehicle to the road.

TIRES DELIVERED BY AIRPLANE.

The efficacy of rush deliveries by airplane was convincingly demonstrated recently when an aviator carried a shipment of seven Diamond tires from Seattle to Everett, Washington, to fill a hurry-up order. The delivery was made forty-five minutes after John K. Healy & Co., at Everett, put in a long distance call to the Seattle branch. The tires were carried on the right wing of a Boeing seaplane and were dropped directly in front of the Healy store as the plane went by.

AMERICAN MOTOR CARS AND TIRES IN THE PHILIPPINES.

In the Philippines in 1918 there were registered 4318 automobiles of 114 different makes, carrying 22,817 passengers. Trucks numbering 567, able to carry 1052 tons of goods, or 6.345 passengers, were also registered. The makes were almost entirely American. As there are few railroads in the islands, automobiles are now becoming important in transporting freight, and British consuls are urging British manufacturers to compete for the business.

What the Rubber Chemists Are Doing.

The Nature of Vulcanization.[1]

By Dr. H. P. Stevens.[2]

Part II. (*Continued.*)

THE ACTION OF SOLVENTS ON VULCANIZED RUBBER.

Portions of the four vulcanized samples were kept for 3 months at winter temperatures and other portions for the same period in an incubator at 30 degrees C. On examining the specimens for solubility in benzene, those specimens preserved at winter temperatures were somewhat less soluble, the specimen (2) now behaving similarly to specimen (3) when originally tested. Those specimens kept at 30 degrees C. were more altered, being still less soluble; thus (1) could no longer be dissolved in benzene on standing overnight and shaking. It was found, however, that all specimens dissolved to a large extent in benzene when left long enough immersed in the solvent.

It is generally agreed that it is exceedingly difficult to remove the last traces of free sulphur from an unvulcanized mixture of rubber and sulphur. Thus the following figures were obtained on the analysis of an unvulcanized mixture of 90 parts of rubber and 10 parts of sulphur before and after extraction for one week:—before extraction, 9.84 per cent sulphur. After extraction, 0.13 and 0.12 per cent sulphur.

The unvulcanized mixture dissolved more readily in benzene than sample (1) above. A difference could be detected in the physical properties so that it may be said that sample (1) showed the effect of vulcanization to a slight degree.

Solvent Action of Benzene on Fully Vulcanized Rubber. Although benzene has but little solvent action on fully vulcanized rubber in the cold, I find that, by prolonged extraction of the acetone-extracted rubber in a Soxhlet at the boiling point, a considerable proportion may be dissolved. The extracted rubber tends to solidify on the sides of the flask in which the solvent is boiled, but part remains in solution. On evaporation of the benzene, the rubber remaining no longer dissolves appreciably when fresh benzene is added and set aside in the cold or the liquid boiled.[3] In this respect the solution of vulcanized rubber obtained resembles that produced by the action of ultra-violet rays on a solution of raw rubber and sulphur in benzene (Helbronner and Bernstein, "*Comptes Rendu,*" 1914, 158, 1343). The recovered rubber is of inferior physical properties. The following experiments were made to ascertain whether it was possible to separate vulcanized rubber into parts containing different proportions of "combined" sulphur.

Two samples of vulcanized rubber, A and B, were extracted with acetone at the boiling point for one week and the combined sulphur estimated. Parts of the extracted rubbers were dried, weighed, and similarly exhaustively extracted with benzene at the boiling point for one week. The extracted rubber was dried and weighed, and the sulphur estimated in the residue.

Benzene extract: (A) 30.8 per cent; (B) 13.7 per cent. Sulphur content of residue before benzene extraction: (A) 3.80, 3.80 per cent;[4] (B) 8.64, 8.77 per cent Sulphur content of residue after benzene extraction: (A) 3.85, 3.86 per cent; (B) 8.35 per cent.

It will be seen that, although an appreciable proportion of the vulcanized rubber was dissolved by the benzene, the residue of A contains the same percentage of sulphur as the original acetone-extracted rubber, and the residue of B almost as much.

The benzene extractions were now repeated with portions of the acetone-extracted rubbers, A and B, which had been put aside for 2—3 weeks in the dark. The benzene extracts were (A) 53.3 per cent; (B) 53.1 per cent.

That is to say, the benzene-soluble had increased to over 50 per cent in the course of aging. I have already drawn attention (8th International Congress of Applied Chemistry, 1910, 25, 585; "*Kolloid Zeitschrift,*" 1914, 14, 96) to the rapid deterioration that rubber undergoes after it has been extracted with acetone, particularly when vulcanized. Such "perished" or "resinified" rubber is readily soluble in benzene. In the above cases the extract had the physical properties of a rubber rather than of a resin, although it underwent a further change on keeping, becoming brittle and "resinous." It was also found that, on keeping the above-mentioned acetone-extracted rubber for 5—6 weeks, it dissolved completely in benzene with the exception of a small amount of a flocculent precipitate, probably due to the protein constituent of the original rubber. The benzene solution when evaporated gave a varnish-like film, moderately hard but inelastic. Portions of the extracted rubber and the extracts of A and B were analyzed.

The extracted rubber contained (A) 3.57, 3.59 per cent; (B) 8.57, 8.38 per cent sulphur; and the benzene extracts (A) 3.34, 3.36 per cent; (B) 8.09, 8.22 per cent sulphur. In both cases the extract contained slightly less sulphur than the extracted rubber. There was also an apparent loss of sulphur during the aging of the acetone-extracted rubber. Some weeks later a portion of the acetone-extracted rubber. A, then aged and perished, was found to contain 3.32 and 3.33 per cent sulphur. These figures compare with 3.80 per cent originally present in the acetone-extracted rubber, A.

As the foregoing results show that the solubility in benzene of an acetone-extracted vulcanized rubber depends on the period that has elapsed since the rubber was subjected to extraction with acetone, it was desirable to ascertain in what degree a sample freshly extracted with acetone dissolved in benzene.

A freshly vulcanized sample of rubber, C, was extracted with acetone for one week and immediately extracted with benzene for a like period. It yielded 10.9 per cent of benzene extract. The original acetone-extracted rubber contained 3.80, 3.70 per cent of sulphur, and the benzene extract 3.68 per cent.

The residue was then immediately reextracted with acetone and gave a small extract amounting to 1.7 per cent containing 3.77, 3.82 per cent sulphur. It appeared that the process of benzene extraction, or the removal of the benzene preparatory to extraction with acetone, had produced some degradation of the rubber, as it then yielded 1.7 per cent to acetone although previously exhaustively extracted with acetone. There was no appreciable variation in the sulphur content.

A portion of the original rubber, C, was also extracted with benzene without previous acetone extraction. The extract consisted almost entirely of sulphur. The residue contained 3.90, 3.97 per cent sulphur.

These figures are a trifle higher than for the acetone-extracted rubber. The fact that very little rubber was extracted by the benzene seems to indicate that vulcanized rubber with this proportion of "combined" sulphur is almost insoluble in benzene and only dissolves when degraded or oxidized,and that such degradation takes place rapidly when exposed to air after acetone extraction or during the acetone-extraction process itself:

[1] Continued from The India Rubber World, October 1, 1919, page 22.
[2] Dr. H. P. Stevens in "The Journal of the Society of Chemical Industry," July 15, 1919.
[3] The rubber sometimes dissolves when covered with benzene and set aside for two or three months.
[4] Here and subsequently duplicate figures give the results of duplicate analyscs.

The stability of a vulcanized rubber varies with the sulphur content of the acetone-extracted rubber, that is, the "combined" sulphur. I have shown by physical tests ("Journal of the Society of Chemical Industry," 1916, 872; 1918, 395 T and 340 T), that a vulcanized rubber of this type is fairly stable over a period of 2—3 years under ordinary atmospheric conditions when the coefficient[5] does not exceed 3. With higher coefficients, such as 6 or 7, decomposition sets in quickly, so that the rubber is brittle or "perished" in a few weeks. It was therefore of interest to compare the behavior to benzene of vulcanized rubber both with relatively low and high coefficients. A has a relatively low coefficient (about 4.3). To compare with A, a rubber, D, was taken which after one week's extraction with acetone gave 9.36, 9.42 per cent sulphur. It was placed in a desiccator for 26 days and the sulphur redetermined. Suplhur=7.41, 7.63 per cent, that is to say, an apparent loss of nearly 20 per cent of sulphur in 21 days. This compares with an apparent loss of approximately 12 per cent in several weeks for sample A.

A great part of this apparent loss is explained by an increase in weight which was found to take place while the rubber was aging.[6] To obtain uniform results, aging was carried out in an incubator at 30 degrees C. A vulcanized rubber, E, was extracted with (1) alcohol one week and acetone one week, (2) as (1) followed by benzene extraction for one week, and (3) benzene extraction only for one week. The extracted samples were dried at a low temperature for a few hours and analyzed without delay. (1) 4.05, 3.95; (2) 4.10, 3.89; (3) 3.90, 3.97 per cent sulphur. These figures show that the vulcanized rubber was in all cases exhaustively extracted and contained no sulphur soluble in organic solvents. The extracts consisted almost entirely of sulphur.

Portions of (1) and (2) were weighed after extraction and placed in the incubator at 30 degrees C. They showed the following increases in weight:—

Days Aging.	(1) Per Cent.	(2) Per Cent.
25	14.7	14.0
49	19.2	18.7

At this stage the specimens contained (1) 3.49 per cent, (2) 3.38 per cent of sulphur.

Assuming the apparent loss of sulphur to be due entirely to the increase in weight, the calculated figures would be (1) 3.35 and (2) 3.37 per cent. During aging, vulcanized rubber emits a peculiar odor and gives off acid vapors due to a trace of a volatile product containing sulphur. When passed into water, the substance is retained and the solution reduces ammoniacal silver nitrate. A trace of sulphur is therefore lost in a volatile form.

Conclusions.

(1) No sharp distinction can be drawn between the "solubility" and "insolubility" of vulcanized rubber in organic solvents.

(2) The more fully the rubber is vulcanized, that is, the higher the percentage of "combined" sulphur, the less is the tendency to dissolve.

(3) Fully vulcanized rubber, such as that containing 3—4 per cent of "combined" sulphur, is almost insoluble in benzene.

(4) Vulcanized rubber rapidly oxidizes after extraction with alcohol or acetone, and becomes soluble to an increasing extent in benzene. "Overcured" rubber with 9—10 per cent of combined sulphur oxidizes more rapidly than rubber with 3—4 per cent of combined sulphur.

(5) Vulcanized rubber recovered from the solution in benzene becomes almost completely insoluble in benzene, provided the original rubber was not oxidized (perished). This recovered rubber possesses the nature and general physical properties of vulcanized rubber.

(6) Vulcanized rubber dissolves more readily in benzene the more it is oxidized. At the same time the recovered rubber becomes more inelastic or "resinous" and dissolves more readily in benzene.

(7) The increase in weight due to the oxidation of acetone-extracted vulcanized rubber fully accounts for the apparent loss of sulphur which takes place. But a trace of sulphur is lost in the form of a volatile product of an acid and reducing nature and containing sulphur.

(8) Extraction with benzene does not allow of the separation of a vulcanized rubber into parts vulcanized to different degrees having different cœfficients.

[5] The coefficient is the percentage of combined sulphur calculated on the raw rubber present in the vulcanized rubber.

[6] In a similar manner a rubber not acetone-extracted but vulcanized to give a relatively high coefficient (say over 4) shows a loss of combined sulphur on aging owing to an increase in the weight of the rubber due to oxidation which accompanies "perishing." Previous acetone extraction of the rubber increases the tendency to oxidation and "perishing" and consequently the apparent loss of combined sulphur is more marked.

CHEMICAL PATENTS.

THE UNITED STATES.

PROCESS OF MAKING WATERPROOFING COMPOSITIONS, comprising heating melted wax, a resinous substance, and dissolved rubber to about 305 degrees F., adding to the mass at 140 degrees F. a resinous substance dissolved in alcohol and a light hydrocarbon oil, then raising the temperature of the mass to about 180 degrees F. (the amount of light hydrocarbon oil added being sufficient to dilute the mass to the desired degree); finally adding to the mass, while at 60 to 80 degrees F., carbon bisulphide. (Guy M. Garlick, Kalamazoo, Michigan, assignor to William S. Mitchell, Gary, Indiana. United States patent No. 1,315,109.)

WATERPROOFING COMPOSITION, consisting of paraffine wax, dissolved rubber, a resinous substance dissolved in alcohol, a light hydrocarbon oil, and carbon bisulphide. (Guy M. Garlick, Kalamazoo, Michigan, assignor to William S. Mitchell, Gary, Indiana. United States patent No. 1,315,110.)

PROCESS AND PRODUCTS OF TREATING VULCANIZED OILS comprising the depolymerizing of a vulcanized oil and repolymerizing the product to a plastic material without vulcanization, producing a product that is similar in elasticity and plasticity to gum chicle. (Walter O. Snelling, Pittsburgh, Pa. United States patent No. 1,315,246.)

PROCESS OF MAKING TIRE FILLERS consisting of subjecting to vulcanization in a mold by heat and pressure a mass composed of small particles of soft rubber, rubber cement, gasoline and kerosene. (Edward F. Aycock, Midlothian, Texas. United States patent No. 1,315,652.)

IMPREGNATING FIBROUS MATERIAL. A new material for articles of footwear comprising a sheet of felted material, and a stiffening composition of resin, oxidizable oil and a drier incorporated for the purpose of making the product transpiratory. (William B. Wiegand and Walter Uffelman, Montreal, Quebec, Canada, assignors to Rubber Regenerating Co., Naugatuck, Conn. United States patent No. 1,317,340.)

THE UNITED KINGDOM.

VULCANIZING RUBBER WITH SULPHUR, accelerated by compounds resulting from the interaction of strong alkalies or strongly basic substances and monohydroxy derivatives of benzene or its derivatives. Sodium phenate is one such compound in which the hydrogen of the hydroxyl groups is replaced by the metal or equivalent radical. In others the meta or para-cresol or beta-naphthol may be the acidic group. (North British Rubber Co. and B. D. Porritt, Castle Mills, Fountainbridge, Edinburgh. British patent No. 129,798.)

VULCANIZING INDIA RUBBER IN THE COLD by alternate treatment with sulphur dioxide and hydrogen sulphide, the two gases yielding sulphur within the substance of the rubber. A solution of hydrogen disulphide in benzene may be used instead of the gas after treatment with sulphur dioxide. The process may be used for the vulcanization of rubber dissolved in a solvent

such as benzene. (S. J. Peachey, 5 Yew Tree Road, Davenport, Stockport, Chester. British patent No. 129,826.)

Puncture Sealing Fluid consisting of a binding agent of rubber, sugar, and sulphite-cellulose lye or pine-tree essence or both. Earthy constituents, such as magnesia or talc, ground rice, or a solution of casein may be added. (P. Warmund, Zurich, Switzerland. British patent No. 130,342.)

THE FRENCH REPUBLIC.

Process for Insulation of Electrical Conductors whereby enameling of the metallic conductor is substituted for the usual coating of tin for the protection of the insulation from the action of the copper conductor with the sulphur in the insulation. (A. Grammont. French patent No. 490,890.)

Vulcanization. New accelerators for vulcanizing rubber. (S. J. Peachey. French patent No. 490,965.)

KAOLINITE.

French industry is making large use of Kaolinite in the manufacture of rubber and other plastic materials. For this purpose a special quality of extreme whiteness and fineness, absolutely free from lead and iron is prepared. The specific gravity is from 2.30 to 2.40. It is recommended as a substitute wholly or in part for zinc oxide.

A CORRECTION.

Donald F. Cranor, author of the paper on "The Effect of Organic Acceleration on the Vulcanization Coefficient," read at the September meeting of the American Chemical Society, corrects the report of his paper printed in these columns in the October issue, as follows:

For the purposes of investigation the author deliberately selected a sample of brown crêpe having unusually poor vulcanizing properties because such a sample best served to bring out the point which it was desired to make. The statement reported, that brown crêpe will not cure satisfactorily without the use of accelerators, is not justified in view of the fact that many brown crêpe lots are excellent and have good curing properties. Mr. Cranor discussed the action of the addition product of dimethylamine and carbon disulphide instead of thio-carbanilide as reported.

NEW JERSEY CHEMICAL SOCIETY PLANS INDUSTRIAL SURVEY.

At a meeting of the New Jersey Chemical Society held in Newark October 13, 1919, the plan of asking the State Commissioner of Labor to promote an official survey of state industries, and particularly the chemical industries, was considered favorably. The object is to make known to the general public the exact facts as to the natural resources of New Jersey and the extent and character of its chemical industries, and thereby to advertise New Jersey as a chemical center and encourage the consumption of American made, and especially Jersey made, products.

RUBBER AND FABRIC SHOES POPULAR.

Manufacturers of part-rubber shoes are preparing to increase their competition against leather and part-leather shoes next year. Rubber and fabric shoes have found many new friends this past season among both men and women. They have been more attractive and serviceable than formerly and the prices make them especially desirable. Very high-grade tennis shoes intended to rival leather footwear at lower prices will be brought out next summer. Heavy work shoes of rubber, fabric and fibre are rapidly finding favor, so that, the two extremes having been supplied, a serviceable shoe for wear at any time should complete the chain of good footwear provided by the rubber industry, at reasonable prices. The high cost of leather shoes also seems likely to increase the wearing of rubbers by women in order to protect such expensive footwear.

LABORATORY APPARATUS.

COMBUSTION AND DEFLAGRATION SPOON.

A SIMPLE device or laboratory tool is the combined combustion and deflagrating spoon shown in the illustration. The container or spoon is not attached but can be transferred to either

Combustion and Deflagration Container

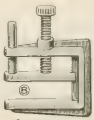
ring of the device, permitting the use of the spoon either vertically or horizontally. (Central Scientific, 460 East Ohio Street, Chicago, Illinois.)

GAS HEATED GLASS CUTTER.

A very convenient tool for laboratory use has been devised by Lieutenant K. H. Parker, formerly of William Jewell College. It

Parker Glass Cutter.

is known as the Parker glass cutter. In general appearance it resembles a hollow gas-heated soldering iron. It is attached to the gas supply by means of rubber tubing, the flow being adjusted until the flame strikes back. When sufficiently hot the cutter is used to lead a crack in the glass in any direction. A deep file cut serves as a starting point for the crack.



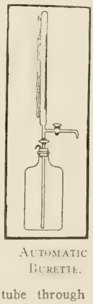
Laboratory Clamp.

SCREW CLAMP.

The illustration shows an improved screw clamp, closed, that furnishes a flat bearing surface. It is particularly effective and convenient in service. (Central Scientific Co., 460 East Ohio street, Chicago.)

AUTOMATIC BURETTE.

A simple automatic burette is shown in the accompanying figure. It is especially useful with solutions which are reduced on extended exposure to the light. At the end of a series of titrations the liquid can be run back into a bottle of dark colored glass. With ordinary solutions it will also be found useful especially in the presence of dust or fumes. It has the advantage of being filled from the bottom and regardless of the amount of solution used it is unnecessary to wait for the tube to drain.



Automatic Burette.

It is made from an ordinary burette. The glass stop-cock is replaced by a larger cock, the lower end of which reaches to the bottom of the bottle. The original stop-cock is lengthened by a short piece of glass tubing, sealed to the burette tube just above the larger cock and bent to form a faucet. The top of the graduated tube is fitted with a small tube to which is attached a piece of rubber tubing, which is used to draw up the liquid into the burette to any desired level. A small curved tube through the stopper regulates the pressure within the bottle. ("The Chemist-Analyst.")

Rubber goods were included in the load of the first Handley-Paige airplane to engage in the parcel service between Paris and London. The plane left Hounslow at noon on September 2 and the goods were delivered to the companies in Paris at 6 o'clock that afternoon.

Activities of The Rubber Association of America.

TIRE DIVISION. The joint Executive Committee of the Pneumatic and Solid Tire Manufacturers' Divisions held its regular monthly meeting at the Association offices, on October 16, there being an almost complete attendance. A docket containing a number of important subjects was disposed of.

MECHANICAL RUBBER GOODS MANUFACTURERS' DIVISION. On October 21 the regular monthly meeting of the Executive Committee of the Mechanical Rubber Goods Manufacturers' Division was held at the Yale Club.

TRAFFIC DEPARTMENT. In keeping with the custom, since the organization of the Traffic Division, to hold every third or fourth meeting at Akron for the convenience of members in that district, the Traffic Department held its regular meeting October 22 and 23 at the Akron City Club. The usual heavy docket, including many timely and important subjects, was disposed of.

Of particular interest is the completion of arrangements for personal attention to the Association's traffic and commerce questions by E. S. Ballard, an experienced commercial lawyer of the firm of Butler, Lamb, Foster & Pope, Cleveland, Ohio. This arrangement will provide a most satisfactory means for handling the legal affairs of the Association's traffic and commerce work.

NEW MEMBERS. At a meeting of the Executive Committee on September 26, the following named firms were elected to firm membership in the Association:

J. Aron & Co., Inc., 95 Wall street, New York City.

Woven Steel Hose & Rubber Co., Trenton, New Jersey.

Madison Tire & Rubber Co., Inc., 30 East 42d street, New York.

REISSUE OF THE "INDEX TO THE MANUFACTURES OF THE PRODUCTS OF THE RUBBER INDUSTRY." The work of securing a complete response to the questionnaire sent to the industry to develop the information upon which to base a reissue of the "Index to the Manufacturers of the Products of the Rubber Industry," is progressing slowly but steadily, and the Association hopes to complete the work within the very near future.

MAP SHOWING LOCATION OF FIRM MEMBERS. Last spring the Executive Committee authorized the preparation of a map to show the location of firm members of the Association over the United States, and the map is now in preparation and, when ready, copies will be distributed to Association members. It is the thought of the Executive Committee that a map of this sort will make it possible for those who may be interested to visualize quickly the rubber inudustry in the United States and Canana, so far as centralization and geographic location are concerned.

A COMMUNICATION FROM THE RUBBER GROWERS' ASSOCIATION, LIMITED.

New York, October 2, 1919.

To the firm members of The Rubber Association of America, Inc.:

There is attached a copy of a circular prepared by the Rubber Growers' Association, Inc., London, respecting the Rubber Uses Development Fund and the prize contest which that association has in contemplation. The circular explains itself.

The proposal of the Rubber Growers' Association was given consideration by the Executive Committee of this organization at a meeting on September 26, and I was directed to distribute copy of the circular to the entire membership of this association with the advice that if they found it convenient to make a contribution to the fund they might do so through this organization, which will transmit the total of the contributions to the Rubber Growers' Association with a statement of the donors thereof.

In the interest of ease and safety in handling the contributions it is requested that checks be made payable to The Rubber Association of America, with a statement of the purpose for which they are intended, and this office will in turn make out a check to the Rubber Growers' Association for the total.

Additional copies of the circular may be had if desired and you may be sure that this office will give every attention to any of the detail which may develop in connection with the contributions from our members to this fund.

A. L. VILES, General Manager.

THE RUBBER GROWERS' ASSOCIATION (INCORPORATED).
38 EASTCHEAP, LONDON, E. C. 3, JULY 23, 1919.
Rubber Uses Development Fund.

Dear Sir(s):

My Council have decided to open a "Rubber Uses Development Fund," for the purpose of extending the present uses or encouraging new uses of rubber, and invite contributions from members and others interested in the production of rubber.

It is desired that a minimum of £10,000 should be raised, and in the first place to inaugurate a prize scheme in the terms of the accompanying draft particulars. It is proposed to offer £5,000 in prizes: to expend about £2,000 in advertisements, and, if necessary, a sum of £3,000 upon the work entailed in receiving, investigating and adjudicating upon the suggestions sent in, and generally in any direction which might be likely to increase substantially the economic demand for the raw material.

The continued success of the plantation rubber industry will depend on the increasing demand for the commodity, and, having regard to the size of the industry and the amount of British capital involved, my council venture to express the hope that the proposals outlined above will meet with liberal response from all interested in the future welfare of the industry.

The following donations have been given or promised, subject to a minimum of £10,000 being raised:

The Rubber Growers' Association	£1,000	0	0
Messrs, Harrisons and Crosfield, Ltd.	1,000	0	0
Straits Rubber Group	1,000	0	0
Messrs. Guthrie & Co., Ltd.	250	0	0
Messrs. Edward Boustead & Co.	200	0	0
Colombo Commercial Co., Ltd.	105	0	0
Grand Central (Ceylon) Rubber Estates, Ltd.	105	0	0
London Asiatic Rubber and Produce Co.	105	0	0
Seafield Rubber Co., Ltd.	100	0	0
Rubber Estate Agency, Ltd.	52	10	0
Tangl[illegible]h Rubber Estate, Ltd.	52	10	0
Batu Caves Rubber Co., Ltd.	50	0	0

Contributions or promises should be forwarded to the association as soon as possible, so that the preliminary arrangements in connection with the prize scheme can be made immediately. Any suggestions relating to the scheme, which you may care to submit, will be welcomed and will receive careful consideration.

FRANK G. SMITH, Secretary.

AND NOW TO CURB TIRE THEFTS.

Stealing automobiles has become a profitable business throughout the country and one that is carried on with far less risk than other forms of thieving involving commensurate returns.

In Massachusetts new laws to check this evil have recently become effective. The punishment for stealing, receiving or concealing motor vehicles has been made a State prison sentence of five to ten years. The life history of every motor vehicle owned in Massachusetts will now be recorded at the State House. Motor vehicle dealers of all sorts are licensed and must report all their transactions. Private owners must give to the police advance notice of intended sale. A clear title will henceforth be required as in real estate transfers. So complete will be the record and cross references that it will be extremely difficult for a stolen car to be registered again without the fact of its theft becoming known.

Stealing tires is as common as stealing cars, and it is highly profitable. Two new high-grade, non-skid, cord tires from a large car are often worth $150 and pneumatic truck tires cost from $120 each upward. So bold are tire thieves that they often jack up a car and remove tires from the wheels. Relatively few motorists keep a record of the serial numbers of their tires, making recovery difficult. Moreover, the tires are often rebuilt and identification marks destroyed.

With tires averaging $25 each and running up to $175 or more; with a car's complement of tires valued at $100 to $750 and thefts rapidly increasing, when will special legislation be devised to check this form of robbery?

Peace Problems and Progress.

PROPOSED CHANGES IN BRITISH PATENT LAW.

A bill now before the British Parliament proposes to cancel the compulsory working and license clause of the Patent Act of 1907 and to substitute a series of alternative provisions. Under this bill any interested person may apply to the Comptroller, alleging that there has been an abuse of the monopoly rights under a patent and asking for relief. Five sets of circumstances are specified as constituting abuse; they are:

(1) Non-working on a commercial scale in the United Kingdom without satisfactory reason.

(2) Prevention or hindering of working in the or on behalf, or with the consent of, or without effective interference by, the patentee.

(3) Demand for a patented article in the United Kingdom not met to an adequate extent and on reasonable terms.

(4) Any trade or industry prejudiced by refusal of the patentee to grant licenses on reasonable terms.

(5) Any trade or industry prejudiced by conditions attached to the patentee to the purchase or use of the patented article.

The Comptroller is to be vested with remedies, also five in number, viz.:

(1) He may endorse the patent with the words "Licenses of Right," after which anyone can obtain a license on complying with certain conditions.

(2) He may order the grant of a non-exclusive license to the petitioner.

(3) He may, in certain circumstances, order the grant of an exclusive license to the petitioner, or to some other person.

(4) He may revoke the patent.

(5) He may make no order.

The bill proposes to lengthen the life of British patents to 16 years, to restore the term of provisional protection to 9 months and extend the time for acceptance to 15 months. Patents unworkable during the war and patents of addition are dealt with. In actions for infringement patents are to be upheld for as much as is good without regard to the invalidity of any other claim in the specification. The grounds upon which opposition may be entered are also considerably extended.

A NEW GERMAN TRADE SERVICE.

The German Government has established the Foreign Trade Bureau of the German Ministry for Foreign Affairs for the purpose of gathering, assimilating, and disseminating such commercial information as may be of use to Germany in the promotion of foreign trade. A council of 25 to 30 members with Dr. Weidenfeld, formerly professor of economics at the University of Halle, as chief, will direct the affairs of the Bureau and have supreme control of all matters within its jurisdiction.

Commercial information received by the Foreign Office, the consulates and legations, will be published on the day of receipt, or if confidential will be transmitted to interested persons. Members of both the diplomatic and consular services will hereafter receive an important part of their training in the Foreign Trade Bureau.

A NATIONAL ORGANIZATION OF GERMAN INDUSTRIES.

The apparent need of industrial organization in Germany has resulted in the formation of the National Union of German Industry, to represent and promote German industries, to bring about a uniformity of action, and to create a community of interest with the workmen.

As a consequence there now exist three great groups in the country which represent the economic life and which will provide the basis for the necessary reorganization of the economic system. They are (1) the workmen's trade unions, which have been recognized by the employers; (2) the associations of employers who were more or less connected with the former Union of Manufacturers and the Federation of manufacturers; and (3) the Imperial Union of German Industry. The industries are to be divided into twenty trade groups.

It is proposed to constitute a general committee composed of 140 representatives from the trade groups, 30 from agricultural and local associations, and 10 from individual undertakings, together with 10 other persons to be suggested by the council at a general meeting. It will be seen that the scheme aims at the centralization of the representation of German industries on economic matters and in the relations between the employers and the workmen.

TAXATION AND THE HIGH COST OF LIVING.

In suggesting the appointment by the Government of a nonpolitical body of experts to study the effects of the various kinds of taxation which have been in force during and since the war, Otto H. Kahn points out in a very informing booklet that the unscientific system of taxation adopted in this country since 1917 has played a considerable part in boosting prices to their present excessively high levels. His belief that the entire matter of excess profits and income taxes should be subjected to unprejudiced and competent critical review with the idea of making recommendations to Congress finds approval in many quarters, and most financial experts agree that a general staff on economic and financial strategy during the reconstruction period would prove as beneficial as the Army and Navy boards of experts have in wartime.

THE WORKERS' SHARE OF PROFIT AND RESPONSIBILITY.

Profits without responsibility appears to be the workingman's idea of the so-called partnership plan now advocated by organized labor. A voice in management is demanded which permits the workers to determine practically their own wages and hours, and also to distribute profits without bringing to the combination any responsibility, either financial, legal or moral. This means complete unionization, domination and control of industry, and under such a régime industry will die.

There is much to be recommended in a co-partnership between capital and labor, but it must be a real partnership in every sense, with labor bearing its share of the responsibility. Profit-sharing is really the crux of the matter, and the plan being advocated by George W. Perkins benefits both employer and employe, eliminating those features of profit-sharing which have made it a failure in numerous instances.

Assuming that every business must, first of all, earn operating expenses, depreciation and a fair return on honest capitalization, and that the compensation paid to employes is for the purpose of earning enough to meet their obligations, he proposes that any profits over and above such sum be divided on some fair percentage basis between the capital used and the employes engaged, in the latter case according to the compensation of the individual worker. That these profits may remain in the business a reasonable time, he proposes that capital's share be carried to surplus, and that labor's share take some form of security representing an interest in the business to be held for three to five years. Thus an interest and responsibility on the part of labor is created and the baneful effects of profit-sharing on a cash basis are eliminated. Such a plan has already proved successful in several instances; it is eminently fair, and it represents the limit of safety in any partnership between capital and labor.

A BRITISH ESTIMATE OF RUBBER ACREAGE.

Addressing the Rubber Plantations Investment Trust in London lately, the chairman, Mr. G. Croll, estimated that the area of land under plantation rubber at the end of December, 1918, was 2,750,000 acres, which on a basis of 400 pounds an acre should yield 500,000 tons of rubber a year. He had hoped that a use would be found first from the growth of the automobile industry in the United States, where 1,000,000 cars were registered in 1913; 2,250,000 in 1916 and, according to the "Board of Trade Journal," 6,000,000 in July, 1919.

New Machines and Appliances.

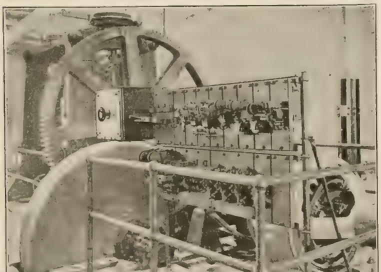
ELECTRICALLY DRIVEN CALENDER AND MIXERS EQUIPPED WITH SAFETY DEVICES.

ONE of the first considerations of the rubber engineer in equipping a modern plant is the selection of motors, controllers, and safety devices to secure maximum protection to the workmen and uniformity of finished product.

In the typical installation here shown small constant speed squirrel-cage motors, not requiring any special control apparatus, are used for most of the machines; the three-roll calender, however, necessitated an adjustable speed, direct-current motor, special automatic controller, and certain safety features; while the three mixing mills are driven by a slip-ring motor, the liability of accident being reduced to a minimum through the installation of a magnetic clutch and brake operated by safety release switches.

Direct current is furnished to the calender motor by a motor-generator set consisting of a three-phase, 220-volt alternating-current motor and two direct-current generators. A three-wire, double voltage system is used with the two generators connected in series. The calender motor is supplied with either 230 volts by using the combined voltage of both generators, or 115 volts by using either generator singly. By means of the double voltage system and a field rheostat, a 4 to 1 speed ratio is obtained with the motor, and fine variation may be had at all speeds.

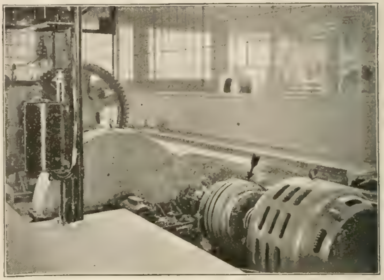
The motor is started by a push-button switch located conveniently on the calender. It is stopped by the slight movement of either of two cradle-operated switches situated on each side of the calender, or by a push-button safety switch or a push-button master switch, both of which are mounted on the calender. Each cradle has three positions, namely, horizontal, up, and down. The horizontal is the running position, the down



MAGNETIC CONTROL BOARD FOR CALENDERS.

effects an ordinary service stop, while an upward movement causes a quick stop by dynamic braking, accomplished by short-circuiting the motor armature through a resistance. The change from one voltage to the other is made by operating a push-button switch on the control board. The motor field rheostat, which is mounted on the left of the control board, is adjusted by hand, and is short-circuited by a push-button switch on the controller, thus allowing two different speeds—fast and slow—for each setting of the rheostat. The motor can be run in either direction by means of a reversing switch on the control board.

The three mixing mills, which do not require speed variation, are driven from one line shaft, by a 200-h.-p. slip-ring motor. By using sliding pinions for engaging the large gear wheels of each mixing machine, any of the mixing mills can be thrown out of gear when their service is not needed, but this method of stopping is too slow to be of any value as a safety device. The best



MAGNETIC CLUTCH AND BRAKE BETWEEN MOTOR AND MIXERS OPERATED BY RELEASE SWITCHES.

provision for safety would require that any mill in the line could be stopped quickly by some means within easy reach of each operator.

These requirements were met by inserting a magnetic clutch and brake on the line shaft between the motor and the first mill. Each mill is provided with cradle-operated switches for breaking the circuit energizing the magnetic clutch. Attached to the shaft on the side of the clutch next to the mills is a brake wheel which receives the brake band, which is tightened by the falling of a weight when magnetically released by the operation of one of the cradle switches. Therefore, the braking action is positive, and an accidental interruption of the circuit results in a safe condition. The instant one of the cradles is moved, the clutch is released and the brake applied. (The Cutler-Hammer Manufacturing Co., Milwaukee, Wisconsin.)

RUBBER SOLUTION AND CEMENT MIXER.

THE EIMCO CEMENT CHURN.

Rubber cement making has grown in importance and volume during recent years, resulting in the development of special churns designed to reduce the working time and improve the product. For example the mixer here pictured is a strong, heavily built machine designed to stand hard work and the strain of high speed. The mixing tank is of cylindrical type and made of heavy boiler plate. It has a hinged cast-iron man-hole cover which makes the machine absolutely gas-tight and prevents the escape of solvent fumes.

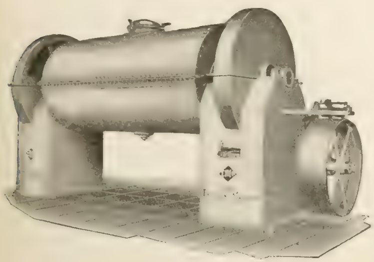
A special patented agitator is one of the features which it is claimed reduces by one-half the time required to mix the product and also greatly improves the quality. The agitator is so designed that it scrapes every inch of the interior of the mixing tank; brings all of the solution into treatment and prevents any of the material from collecting in the corners, thus keeping the inside of the tank clean.

The speed arrangement permits using a slow mixing action at the start and an exceedingly high speed to finish the opera-

tion. This is another feature that helps materially to reduce the operating time.

The illustration shows the machine set up for operation and the type of agitator used in machines of 300 to 1,000 gallons capacity.

These machines are built in various sizes and types with single and double agitators to meet all requirements. Tilting trough

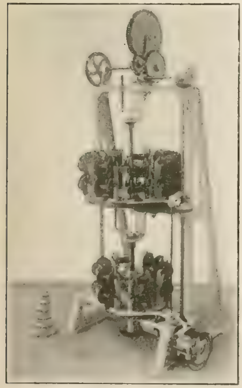


The Eimco Cement Churn.

types are constructed with capacities of 50 to 200 gallons and are tilted to discharge their contents. The cylindrical or non-tilting types of 50 to 1,000 gallons capacity are discharged through bottom gates. (The East Iron & Machine Co., Lima, Ohio.)

TWO-HEAD VERTICAL STRANDING MACHINE.

The accompanying illustration represents a 30-reel 2-head vertical stranding machine for stranding copper wires from No. 28 to No. 36 B. & S. gage. It is designed to take metal spools 3¾ by 2¾ inches, on which the manufacturers ship the wire, thus doing away with respooling. The lower head carries 12 reels and the upper head 18 reels. The heads are arranged to run in opposite directions at a ratio of 4 to 5, and also in the same direction at the same speed.

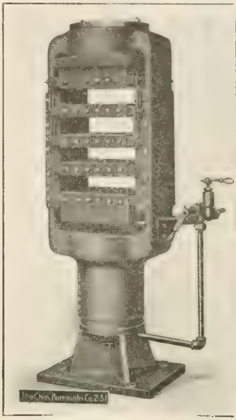


Vertical Stranding Machine.

The machine is driven by tight and loose pulleys, and is equipped with a stop motion which stops the machine when any wire breaks or the reels run out. The tight and loose pulleys are 6 by 1½ inches and run 325 r.p.m. This gives a speed of the lower disk of 215 r.p.m. and that of the upper disk 175 r.p.m. The take-up sheave is 8 inches in diameter, and a complete set of change gears is provided for different lays. The bench space of the machine is 2 feet 8 inches by 1 foot 9 inches. (New England Butt Co., Providence, Rhode Island.)

RODLESS HYDRAULIC VULCANIZING PRESS.

The rodless hydraulic press has been perfected to overcome the defects of the old style presses with threaded rods on which the nuts are constantly working loose, thereby throwing the platens out of parallel, injuring the work, and forcing two of the rods to bear the entire load.



Rodless Press Vulcanizer.

In the rodless press the cylinder, cheek pieces and top head are one solid open-hearth steel casting. The cylinder and lower face of the top head are machined at one setting, thus insuring perfectly parallel surfaces between the platens. This construction secures absolute rigidity as there are no parts to work loose. Another improvement over the ordinary press is found in the copper-lined cylinder which makes a perfect surface for the packing of the ram to slide upon. Without this copper lining the cylinder and ram in a short time become corroded and rapidly wear out the packing requiring frequent replacement.

Where the platens are steam-heated, cooling ribs are cast upon those that contact with the head and ram platens, thus preventing overheating of the top head and ram.

To vary the opening of a rod-press, dependence is placed on adjustment of nuts on the rods. In the rodless construction a series of rings is placed between the top plate and the head. These are made in multiples of an inch, are instantly removable, and without adjustment the plates must come parallel. (The Charles Burroughs Co., 141 Commercial street, Newark, New Jersey.)

A NOVEL RUBBER CEMENT DISPENSER.

The rubber cement dispenser here shown has been recently perfected and will undoubtedly become popular with users of rubber cement, due to the saving of labor and conservation of cement obtained by the construction of this device.

The McNutt Cement Container.

These containers, ranging in capacity from one-half pint to one gallon, may be filled in the usual manner and closed by a screw cap, thus keeping the contents in good condition until used. The cement feeds from the bottom of the container to the brush cup, thereby permitting the use of settling compounds with uniform results, avoiding the waste common to ordinary containers.

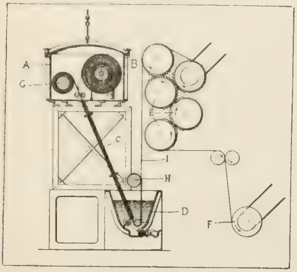
The brush is protected by being immersed in the cement when not in use and a disk that prevents the cement from reaching the handle of the brush, acts as a cover to the cement cup. (W. H. McNutt, 83 Chambers street, New York City.)

Index to "Rubber Machinery" will be sent free upon request.

MACHINERY PATENTS.

MACHINE FOR IMPREGNATING TIRE FABRIC.

TIRE fabric is subjected to vacuum and then passes by means of a channel through an impregnating chamber containing rubber solution that forms a seal for the channel.



TIRE FABRIC IMPREGNATOR.

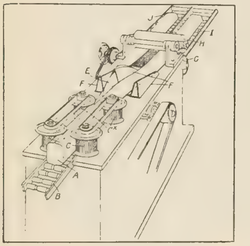
A vertical section of the apparatus is here shown, *A* being the vacuum chamber enclosing the fabric-roll *B*, and *C* is the channel communicating with *D*, the solution tank, *E* indicates the drying rolls and *F* the fabric wind up roller.

In operation, the free end of the fabric is fastened to a cross-bar attached to a pair of metal ribbons, the ends of which are coiled on roll *G*, the other ends passing downward through the channel and impregnating tank and are attached to the roll *H*, which is revolved by hand, threading the fabric through the apparatus. The fabric is then attached to the apron *I* which carries it between the drying rolls and finally to the wind-up roll.

(John E. Thropp and Peter D. Thropp, assignors to the Delaski and Thropp Circular Woven Tire Co., all of Trenton, New Jersey. United States patent No. 1,312,878.)

MACHINE FOR SPLITTING EXTRUDED DOUBLE SOLID TIRES.

The double tire A shaped by extrusion through a die is fed along a roller track B by profiled rollers C and CX and severed longitudinally by a rotating disk E working in a guard F. This is provided with extensions adapted to divert the severed sections through a right angle to facilitate their delivery on roller tracks I, J by a roller G and coacting weighted roller H.



SOLID TIRE SPLITTING MACHINE.

The rollers C and CX may be replaceable or mounted for lateral adjustment. Water may be supplied to the cutter E to facilitate cutting, and the cutter may be laterally adjustable or replaced by a band knife. (Dunlop Rubber Co., C. Macbeth, and H. Willshaw, 14 Regent street, Westminster, England. British patent No. 130,116.)

OTHER MACHINERY PATENTS.

THE UNITED STATES.

NO. 1,314,714. Device for curing and shaping tire patches. A. J. Stephens, Kansas City, Mo.

1,314,733. Apparatus for rolling tire treads. F. B. Converse and J. L. Butter, Akron, O., assignors to The B. F. Goodrich Co., New York City.

1,315,200. Plural-part mold for repairing rubber boots, etc. J. W. Arthur, assignor to The Williams Foundry & Machine Co.—both of Akron, O.

1,315,526. Tire strip reeling machines. De C. Neal, assignor to Morgan & Wright—both of Detroit, Mich.

1,315,731. Repair vulcanizer. A. B. Low, assignor to A. M. Darragh—both of Denver, Colo.

1,315,763. Apparatus for waterproofing felt. C. T. Dickey, Elizabeth, assignor to J. J. Voorhees, Jr., Jersey City—both in New Jersey

1,315,981. Tire-making machine. F. C. Morton, New Haven, Conn.

1,316,052. Machine for making hose. J. T. Lister, Cleveland, O.

1,316,105. Multiple vulcanizing press. E. Nall, Akron; E. A. Nall, Cuyahoga Falls, executrix of said E. Nall, deceased, assignor to The Goodyear Tire & Rubber Co., Akron—both in Ohio. (Renewed July 17, 1917. Serial No. 181,166.)

1,316,272. Tire core of sheet metal and process of manufacture. D. A. Clark and C. E. Lowe, assignors to The Clyde E. Lowe Co.—all of Cleveland, O.

1,316,273. Sheet-metal tire core. D. A. Clark and C. E. Lowe, assignors to The Clyde E. Lowe Co.—all of Cleveland, O.

1,316,274. Mandrel for tires. D. A. Clark and C. E. Lowe, assignors to The Clyde E. Lowe Co.—all of Cleveland, O.

1,316,275. Mandrel for inner tubes. D. A. Clark and C. E. Lowe, assignors to The Clyde E. Lowe Co.—all of Cleveland, O.

1,316,276. Mandrel for inner tubes. D. A. Clark and C. E. Lowe, assignors to The Clyde E. Lowe Co.—all of Cleveland, O.

1,316,356. Tire-building machine. F. B. Converse, Akron, O., assignor to The B. F. Goodrich Co., New York City.

1,316,805. Cementing device. M. A. Replogle, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

1,317,124. Tire vulcanizer. D. E. Booth, Tulsa, Okla.

1,317,374. Device for maintaining tension in tire machines. C. Kuentzel, New York City, assignor to The Goodyear Tire & Rubber Co., Akron, O.

1,317,526. Stand for finishing tires. A. J. Savage and H. I. Morris, assignors to The Savage Tire Co.—all of San Diego, Calif.

1,317,657. Apparatus for manufacturing pneumatic tires. E. Hopkinson, New York City.

1,317,661 Two-part mold for tire vulcanizing. B. Darrow, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

1,317,664. Apparatus and method for building up cord blankets for pneumatic tires. E. Nall, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

1,317,668. Automatic valve controller for hydraulic press. W. E. Shively and K. B. Kilborn, assignors to The Goodyear Tire & Rubber Co.—all of Akron, O.

1,317,669. Vulcanizer for cord tires. E. G. Templeton, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

THE DOMINION OF CANADA.

192,984. Apparatus for testing tires. E. Ramisdell, Cleveland, O.

193,009. Device for repairing pneumatic-tire tubes. G. B. Wood, Detroit, Mich., U. S. A.

THE UNITED KINGDOM.

129,222. Mixing machine. W. H. Read, 27 Caledonian Road, King's Cross, London. (Read Machinery Co., York, Pa., U. S. A.)

129,411. Apparatus for making tires, transporting during manufacture, etc. Dunlop Rubber Co., 14 Regent street, London, and C. Macbeth, Para Mills, Aston Cross, Birmingham.

129,813. Sewing machine for shiping tire fabrics. F. Lehmann, Trimbach, near Olten, Canton Solothurn, Switzerland.

NEW ZEALAND.

40,001. Two-part mold for tires. A. J. Ostberg and A. Kenny, Judd street, Richmond, near Melbourne, Vic.

THE FRENCH REPUBLIC.

490,805. Apparatus for making rubber tires. E. Hopkinson, 1790 Broadway, New York City, U. S. A.

AUSTRALIA.

To Americans.

8,280. Machine for attaching heels consisting of sections of leather and rubber in which nails are first driven through the leather heel into the sole and afterward through the rubber section into the leather heel. The British United Shoe Machinery Co. of Australia, Proprietary, Limited, assignee of J. F. Standish, inventor, Massachusetts, U. S. A.

PROCESS PATENTS.

THE UNITED STATES.

NO. 1,314,931. Manufacture of casings for pneumatic tires, etc. E. K. Baker, assignor by mesne assignments to himself and C. G. Hawley—both of Chicago, Ill. (Original application divided.)

1,315,364. Manufacture of pneumatic tires. F. S. Dickinson, New York City.

1,315,710. Manufacture of pneumatic tires. A. A. Crozier, London, Eng.

1,316,104. Manufacture of cord tires. E. Nall, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

1,317,442. Manufacture of hot-water bottles. R. Griffith, assignor to The Miller Rubber Co.—both of Akron, O.

1,317,665. Combined steam and acid cure for inner tubes. C. B. Orr, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

New Goods and Specialties.

FOR THE PROTECTION OF LINEMEN.

To meet the demand from linemen for rubber articles to aid them in protecting themselves from electric wires, makers of rubber goods are constantly developing new ideas. Certain standard goods come to be required and others are much in demand. A new item is shown in the accompanying illustration. It is made of three layers of rubber and two of canvas arranged alternately, with the canvas layers laid crosswise with respect to each other. This trough is shaped to fit over live wires for insulation purposes. Two hard rubber rings, slotted, with an opening sufficiently large to admit the wire, serve to clamp the shield securely to it. Each shield is subjected to a submerged test of 30,000 volts of electricity before leaving the factory. The device can be applied in other ways as well as over wires. It may be used on the cross-piece or elsewhere, since it opens out easily when required. (Mathias-Hart Co., 516 Atlantic avenue, Boston, Massachusetts.)

Lineman's Protector.

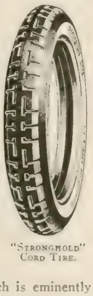
RUBBERIZED LIFE-SAVING SUIT.

Kenyon Life-saving Suit.

One of the newest designs in life-saving suits is shown here. It consists of a suit of rubberized material provided with the usual weighted feet, mittens in one with the sleeves, etc., but the novel feature, of which little appears in the picture, consists of two wing-like extensions back of the shoulders, which when inflated, form the buoyant portion of the suit. The suit is open at the top and is drawn up with a strap as indicated. This design has been patented. (C. Kenyon Co., 754 Pacific street, Brooklyn, New York.)

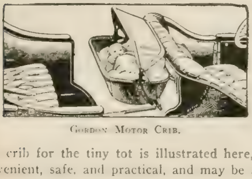
CORD TIRE OF NOVEL DESIGN.

The growing popularity of cord tires has resulted in many new designs being put on the market. Some of these are decidedly novel, with the design cut into the tread so as to provide a non-skid feature. The one illustrated has a side-wall especially prepared to withstand abrasion, rut wear, and the steel cables in the beads are separately insulated. The breaker strip is of heavy impregnated fabric. (The Rubber Products Co., Barberton, Ohio.)



"Strongmold" Cord Tire.

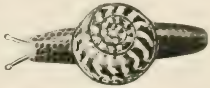
AUTO BABY CRIB.



Gordon Motor Crib.

A crib for the tiny tot is illustrated here, which is eminently convenient, safe, and practical, and may be attached to the robe rail or rear of the front seat of an automobile. It is made of durable tan cloth fitted to a frame of black enameled steel, and is trimmed with a finish of fabric leather of the rubberized type. The crib is 32 by 14 inches in size and is steadied by a spring which attaches to the back seat or floor of the car. By means of this spring, also, the crib can be adjusted for children of different weights up to two years of age. There is also a hood that is adjustable, to protect the child from sun, rain, and wind. With a crib of this kind the mother can drive her own car if she so desires, while the baby is near enough to be within reach of her hand. By unsnapping the understrap and loosening two thumb-screws, the crib may be folded against the back of the seat when unused, yet remain attached to the car ready for immediate adjustment. (Gordon Motor Crib Co., 27 West So. Water street, Chicago, Illinois.)

"Fitwell" Baby Pants.



Australian Tiger Snail.

TIGER SNAIL OF AUSTRALIA.

A manufacturer of toys has devised a representation of the tiger snail of Australia. It is made of metal with wind-up device by which it can be made to crawl on almost any smooth surface. This wind-up device is patented. The "feelers" or antennae of the snail are of rubber with painted tips. This adds one more member to the family of "crawling bugs." (Animate Toy Co., 31 East 17th street, New York.

"UTILITY FITWELL" BABY PANTS.

Another style of adjustable baby pants is pictured above. It has no buttons and requires no pinning or sewing, being adjusted by means of a buckled strap at the waist and drawstrings at the knees. This is made of waterproof fabric and also of rubber only. (Stern Specialty Co., 40 East 22d Street, New York.)

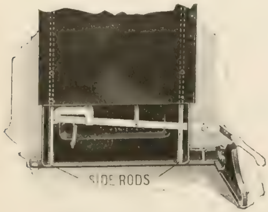
NEW WATERPROOF CAPE.

("The India Rubber Journal.")
English Rain Cape.

Women's single-texture waterproof capes are now popular in England. They are made with very wide skirts, sometimes as much as 112 inches, with only one seam. The favorite shades are biscuit, dull stone, or light mole, which afford a good contrast for the braiding on the deep, square collar. There are slits for the hands, finished with laps, and the fastening is accomplished by means of buttons and button-holes widely spaced the entire length. These capes are worn 46 or 48 inches long and afford thoroughly practical protection from bad weather.

THE "LINE-A-TIME" HELPS THE COPYIST.

A new device for holding note-books, copy, etc., for the convenience of the typist, has been developed as illustrated below. From the side supporting arm held in place by a single screw inserted beside the typewriter on the table or desk, rise side rods which support the plate on which the copy rests. A stationary bar bears against the note-book below the line of copy while another crossbar on which are rubber rollers further assists in holding the copy in place. A coiled spring which stretches across at the top holds back the pages used. At the bottom, within easy reach of the right hand, is a screw for adjusting the line spacing to the requirements of the particular copy being used. The copy or notebook is then raised a line at a time as required, the line of copy being practically on a level with the eyes of the operator. The accessory has rubber feet and rubber to decrease noise and otherwise facilitate operation. (The Line-a-Time Manufacturing Co., Rochester, New York.)

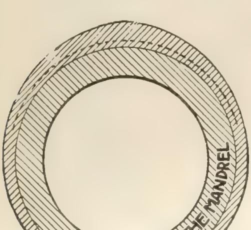


"Line-a-Time" Copy Holder.

GORED STORM RUBBER.

Among the standard lines of overshoes for men and women, a most popular one is the "storm" pattern, with a high back, a comparatively low quarter, and a vamp coming up high over the instep, the whole following closely the lines of a "Romeo" slipper. A style of rubber which combines this shape with that of a sandal is, to all intents and purposes, a "storm" with the side space filled in with a thinner gore acting like the elastic web of a "Congress" shoe. The style shown here has the extension heel which, besides strengthening the most vulnerable point of a rubber overshoe, also serves as a "self-acting" heel when removing the rubber. (Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, Canada.)


Gored Storm Rubber.



The "Air-Container."

TO MINIMIZE PUNCTURES.

An inner tire which will tend to decrease the number of punctures and give additional mileage to tires is represented by the "Air Container shown in cross-section above. This is built of cord and rubber and, it is claimed, will not deflate when punctured. (The Air Container Co., Inc., Boston, Massachusetts.)

NEW HEEL WITH PNEUMATIC INSERTS.

By means of a newly invented electrical machine, leather heels are transformed into non-slip pneumatic ones by inserting pieces of rubber which project slightly below the surface and prevent the leather from coming into contact with hard pavements. Any ordinary leather heel may be so treated. It is the intention of the inventor to place these machines in shoe stores, so that heels may be equipped with these pneumatic inserts at the time of purchase, if the buyer so desires. (Pneumatic Shoe Heel Machinery Co., Inc., 1133 Broadway, New York City.)


Pneumatic Heel.

THE "COLONEL" GOLF BALL DIMPLED.

The popular "Colonel" golf ball, formerly made in meshed marking only, is now to be had in dimple marking, also, in various weights. The "Colonel 30" is the name of an entirely new weight in the dimpled marking. (The St. Mungo Manufacturing Co. of America, 121 Sylvan avenue, Newark, New Jersey.)

A TIRE OF CLASSIC DESIGN.

Among the new tires appear some treads with adaptations of conventional classic designs. The "Trojan," shown here, is of this type. It is made in the 30 by 3½-inch size. (Sterling Tire Corp., Rutherford, New Jersey.)

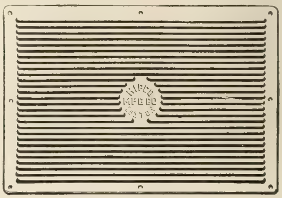
"Trojan" Tire.

STEAMSHIP MAIL BY FLYING BOAT.

To demonstrate the possibility of delivering belated mail to vessels at sea, the "Popular Science Monthly," New York City, arranged recently for dropping a rubberized mail bag like that described in The India Rubber World, August 1, 1919, from a flying boat to the *Adriatic*, two hours out of New York, in the Ambrose channel. The mail pouch, in an outer container, was attached to a steel airplane cable 200 feet long, having rubber shock absorbers inserted near the juncture point. Two-pound bags of shot were attached to each of seven divisions at the other end. These wrapped themselves around the stay from the foremast to the fore mainmast, jerking the mail bag from its chute into the water, from which it was pulled to the bridge by its own cable.

RUBBER MAT FOR RUNNING BOARDS.

A new mat for the running board of automobiles is made of a special rubber composition reinforced with impregnated fabric at the outside edges. This causes it to lie flat. Copper-plated washers are embedded in the rubber to support fastening bolts or screws. A patent is pending on this "Hipco" mat. (Hipco Manufacturing Co., 34 Columbus avenue, Boston, Massachusetts.)


"Hipco" Running Board Mat.

GAS MASK FOR CHEMICAL FUMES.

A new rubberized khaki gas mask has been patented which, it is claimed, will withstand rough handling and the heaviest chemical fumes. It also protects the wearer against dust, gases, and smoke as well as against fumes. The construction is different from the ordinary muzzle respirator, ear-loops holding the device in place.


"Diamond" Fume Mask.

It is claimed that it will not crack or fall apart in handling, washing, or contact with dust, fumes, or gases. (The Hygeia Respirator Co., Inc., 142 Fifth Avenue, New York City.)

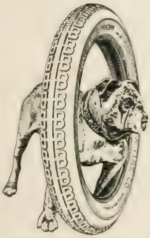
"MILADI-DAINTIE" APRON.

A new apron for the maid or housewife takes the form of a dainty one with a bib, designed like the customary maid's apron, with a round apron part with a patch pocket for small articles. The apron is made of rubberized fabric, in gray, and comes packed in an individual envelope under the trade-mark "Ritz" enclosed in a diamond. This apron can be cleaned with warm water and soap but should not be rubbed and should be dried by hanging in some place that is not hot.

TOOL KIT FOR VULCANIZING.

One of the mail-order companies includes in its catalog a tool kit consisting of eight especially designed tools for use in tire repairing. The set, packed in a leather case for rolling up, includes a roller, plug pliers, a probe, rubber roughener, cement brush, shear snips, a knife, and a stitcher.

(Charles William Stores, Brooklyn New York.)


Braender Cord Tire.

A MOLDED CORD TIRE.

A tire which has, it is claimed, the best features of the plain, ribbed, and non-skid tires, is represented in the accompanying illustration. The tread is said to produce a vacuum on wet pavements, making the use of chains unnecessary, and also giving strong traction on rough and hilly roads. (Braender Rubber & Tire Co., Rutherford, N. J.)


Classic.

A CLASSIC SANDAL.

In the manufacture of rubber-soled, fabric-upper footwear, the producers are not simply approaching their rivals, the leather shoe manufacturers, they are already abreast of them in the race for business, and in some lines they are outdistancing them in the beauty and variety of design and in the quality of workmanship of the finished product.

As an example of this equality a five-strap sandal is here shown. Designed on artistic lines, the shoe commends itself for its beauty, while in finish and workmanship it is of the best. The upper is of white duck, the seams as well as the edges being bound with piping. The buttons are of white agate. The sole and heel, of white rubber, are joined to the upper with a neat, narrow foxing. The heel is low, being especially appropriate for growing girls, misses, and children, for which trade the sandal is intended. (The Columbus Rubber Co., of Montreal, Limited, Montreal, Quebec, Can.


"Aero" Inner Tire.

A CUSHION INNER TIRE.

An inner tire that contains numberless cells or pores filled with air, like a sponge, tends to eliminate the liability to punctures and blowouts. The "Aero" cushion tire shown here in cross-section is so made from Para rubber, molded to fit the casing. This cushion inner tire takes the place of the usual pneumatic tube and can be used with any make of casing or rim. This type of inner tire is made for bicycles as well as for automobiles. (Aero-Cushion Inner Tire and Rubber Co., 909 Ford Building, Detroit, Mich.)

CONVENIENT FOUNTAIN PENS.

A convenient design in fountain pens has been produced that has a metal cap on the end of the pen and this cap, in turn, is fitted with a ring for attaching to a watch chain. When the pen cap is in place, secured by screw-threads, the pen can be placed in the pocket with the assurance that it cannot slip out without attracting the notice of the wearer.

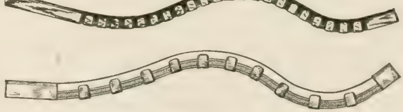

"Merchant" Writing Set.

This kind of pen may be obtained in a number of different designs in order to suit all tastes, some being ornamented with silver and gold mounting. In addition, one style included in the "Merchant" writing set comes in rolled gold, 14-karat gold, or sterling silver, with collapsible pencil to match, both having the ring in the end. Both the pen and pencil in this set are provided with tubes containing, respectively, ink tablets and extra leads. A different model is made with a self-filling lever. (The U. S. Victor Fountain Pen Co., Inc., successor to United States Fountain Pen Co., 115 Worth street, New York City.)


"Victor" Collapsible Fountain Pen.

ADJUSTABLE RUBBER CURVE-RULERS.

Those who use drawing instruments will appreciate the convenience of these rubber curve-rulers. Two are of black and white rubber, respectively, sliding between steel ribbons, and the third has a square lead bar sliding similarly, the whole rubber-covered. (F. Winthrop Davenport, Providence, R. I.)



"Davenport" Adjustable Curve-Rulers

United States Commerce in Crude Rubber for Calendar Year 1918.

The decision of the Treasury Department to make out its annual returns according to the calendar year, from January to December inclusive, instead of the fiscal year, from June 30 to June 30, which had been the rule for many years, will make statistical comparisons and the inferences drawn from them liable to some degree of inaccuracy. In the returns for the calendar year 1918, the figures for the first six months ended June 30, have already been used for the returns of the fiscal year 1917-1918, so that in using the figures it must be remembered that for six months they are identical in both annual reports.

CRUDE RUBBER IMPORTS.

For the calendar year 1918 the imports of crude rubber were 325,959,308 pounds, a falling off of over 60,000,000 pounds from 1917-1918, which was a record year for rubber importation. The value of the rubber was $146,378,313, nearly $60,000,000 less than in 1917-18. From the Far East, now the main source of rubber, the United States imported in 1918, 268,710,068 pounds, valued at $125,005,308, as against 312,322,887, valued at $169,086,900 in 1917-18. From the Straits Settlements came 198,904,100 pounds compared with 221,389,870 pounds, from British India 9,248,210 pounds, from the other British possessions 19,543,495 pounds, from Hong Kong 562,717 pounds, and from the Dutch East Indies 37,344,813 pounds as compared with the 53,663,857 pounds for 1917-18. From the French possessions came 15,680 pounds, from China 559,658 pounds, as against 11,763 pounds, and from Japan a like notable increase, 2,529,395 pounds as against 61,160 pounds in 1917-18. It is interesting to note that the Philippines sent 666,012 pounds in 1918 and only 80,644 in 1917-18.

The second source of rubber is South America. Brazil sent 40,332,620 pounds, value $13,378,588, in 1918, and 41,277,914 pounds, value $14,307,158, in 1917-18; Peru sent 1,373,751; Colombia, 884,792; Argentina, 390,734; Equador, 244,521; Venezuela, 158,857, and British and Dutch Guiana, 53,477 pounds, in each case a marked falling off. The imports from Bolivia were 474,781 pounds in 1918.

Third among the producers was Mexico, the imports being 2,185,809 pounds compared to 1,033,087 pounds for 1917-18. The imports from Panama were 164,445 pounds, from Nicaragua 158,140 pounds, from the other Central American states 64,489 pounds. From the West Indies came 51,680 pounds, as against 69,352 in the previous period. Cuba sent 4,390 pounds. The imports from Africa increased slightly in 1918; from British possessions came 76,264 pounds instead of 28,454 pounds, and from Portuguese posessions 22,622 pounds instead of 38,414.

The other countries produce no rubber but act as middlemen for their own possessions and others. From Great Britain, the United States imported 6,627,165 pounds in the calendar year 1918 and 21,926,943 pounds in the 1917-1918 period; from Portugal came 424,424 pounds in 1918; from France 160,318 pounds, and from Canada 2,712,336 pounds, compared with 4,247,287 pounds for 1917-18.

IMPORTS BY CUSTOMS DISTRICT.

There was some shifting in the amounts received by the various customs districts: New York with 119,664,398 pounds, value $49,381,919, in 1918, showed a marked falling off from the 171,643,218 pounds and the $83,365,120 of 1917-18. Washington, which means Seattle and Tacoma, received 109,557,617 pounds, value $51,099,147, a slightly higher price than the New York rubber; San Francisco received 53,063,123 pounds worth $28,445,675, as against 80,907,215, a distinct decline in quantity; Buffalo fell to 693,490 pounds, Michigan to 336,194 pounds, Southern California to 78,345 pounds, New Orleans to 10,650 pounds.

On the other hand, Ohio rose to 19,157,829 pounds as compared with 12,944,474; Massachusetts to 10,222,733 pounds, compared with 4,327,090 pounds; Dakota to 6,008,636, compared with 3,471,093; Vermont 4,095,971 pounds, compared with 3,471,093; San Antonio 808,372 pounds, compared with 33,193 pounds, and Chicago 1,297,791 pounds, compared with 809,095. Philadelphia's 31,480 pounds and St. Lawrence's 487,934 pounds are also increases. Omaha with 48,445 pounds and Pittsburgh with 96,732 pounds, are added to the list this year while Florida is left out. The figures show the distribution of the rubber according to the official ports of entry; they throw little light on the statistics of the ports where the crude rubber was actually landed.

CRUDE RUBBER EXPORTS.

Crude rubber was exported from the United States in 1918 to the amount of 6,150,755 pounds, value $3,133,622. Of this, 5,568,816 pounds went to Canada, 227,125 pounds to Australia, 229,790 pounds to Cuba, and 123,395 pounds to England. The amount reexported in 1917-18 was 8,208,280 pounds, and in the year before, 12,355,898 pounds.

GUTTA PERCHA.

Gutta percha was imported into the United States during 1918 to the amount of 1,207,986 pounds, value $225,922; of this, 354,794 pounds came from the British East Indies, 306,241 pounds from the Dutch East Indies, and 524,160 pounds from British Africa. The amount imported in 1917-18 was 1,151,312 pounds. This year 470,478 pounds came in at New York, 501,760 pounds at New Orleans, 228,696 at the Washington ports, and the remnant at San Francisco. To England, too, went 126,731 pounds of crude gutta percha.

GUAYULE.

Guayule amounting to 1,376,085 pounds, worth $413,484, came into the United States in 1918, 1,371,385 pounds from Mexico, the rest from Colombia. Almost all, 1,323,435 pounds, entered at San Antonio, Texas; 47,950 pounds at El Paso; 4,700 pounds at New York; 9,778 pounds of this was reexported to Canada. In 1917-18 the imports of guayule were 4,307,539 pounds.

BALATA.

The imports of balata in 1918 were 1,547,338 pounds, value $836,383, as compared with the 2,449,881 pounds and $1,278,610 of 1917-1918 and the 3,287,445 pounds and $1,649,452 of 1916-17, a steady decline. It all came to New York; 535,065 pounds from Panama, 316,520 pounds from Colombia, 260,491 pounds from Venezuela, 218,868 pounds from British Guiana, 120,078 pounds from Dutch Guiana, 32,814 pounds from the Dutch West Indies, 53,883 pounds from Trinidad and Tobago, 7,619 pounds from Brazil, and 2,000 pounds from Equador. Exports were: 652,902 pounds to Great Britain, 9,639 pounds to Canada, 43,644 pounds to Japan, and 5,000 pounds to Greece. In all, 706,185 pounds, worth $436,252, were reexported.

RUBBER SCRAP.

The imports of rubber scrap in 1918 were 8,526,420 pounds, value $645,581. The United Kingdom contributed 4,741,202 pounds, Canada 1,390,235 pounds, Newfoundland and Labrador 64,205 pounds, New Zealand 83,345 pounds, Australia 10,000 pounds, France 780,347 pounds, Italy 242,376 pounds, Cuba 585,435 pounds, and Brazil 473,196 pounds.

RECLAIMED RUBBER.

Reclaimed rubber amounting to 2,904,234 pounds, value $502,176, was exported in turn. In 1917-18 the figures were 3,284,953 and $567,278; this year's figures are the lowest for both amount and value, since 1904 at least.

JELUTONG (PONTIANAK).

Free jelutong to the amount of 9,932,476 pounds, value $678,916, was imported in 1918, of which 6,807,262 pounds came from the

British East Indies, including Borneo, and 3,099,282 pounds from the Dutch East Indies. For the preceding years the amount of free and dutiable jelutong in 1917-18 was 17,475,863 pounds, valued at $975,716; for 1916-17 only dutiable jelutong is reported, 23,376,389 pounds, worth $1,044,022. The districts which received it were New York, San Francisco, Washington and Vermont.

THE EDITOR'S BOOK TABLE.

OPPORTUNITIES FOR HANDICAPPED MEN IN THE RUBBER Industry. By Bert J. Morris and Charles H. Paull, Bureau of Vocational Guidance, Division of Education, Harvard University. Prepared by the Bureau of Vocational Guidance in Cooperation with Red Cross Institute for Crippled and Disabled Men, 311 Fourth Avenue, New York. Edited by Douglas C. McMurtrie. (Paper covers, 125 pages, 6 by 9 inches, illustrated.)

This volume effectually states in untechnical language the opportunities afforded handicapped men in the rubber industry. The basic features of the industry, the source of crude rubber, and the organization of a modern rubber factory are outlined. Reference is made to these provisions for training workers and teachers in shop schools.

The book chiefly consists of a systematic account, in the form of brief descriptions, of the operations used in the preparation of crude rubber for manufacturing purposes and those involved in the main manufacturing divisions of the industry, such as rubber footwear, rubber clothing, medical goods, mechanical goods and tires. The operations are treated in detail. After each description a brief statement is made concerning the time required to learn the work, the average wages paid at the present time, the opportunities for advancement, and the suitability of the work to various handicaps.

The book is instructive and will doubtless prove helpful in assisting many crippled war veterans to self-supporting positions in the rubber industry.

THE CONDENSED CHEMICAL DICTIONARY. COMPILED AND edited by the technical staff of the Chemical Engineering Catalog. First Edition, 1919; 525 pages, 6 by 9 inches. The Chemical Catalog Co., Inc., 1 Madison avenue, New York City.

This volume is designed for technical and non-technical inquirers who will find the book a short cut to concise information concerning the properties, derivation, grades, containers for, uses, fire hazard, and railroad shipping regulations of an extensive list of chemicals and other materials embraced in commerce and industry.

India rubber is cataloged under three heads, thus: P. 135. Caoutchouc, See Rubber. P. 267. India Rubber, See Caoutchouc. P. 406, Rubber, See Caoutchouc. Which is of course strictly accurate but not very informing.

Balata is stated incorrectly to be "rubber gum."

It is somewhat surprising that in the descriptions of the following named materials, their use in the rubber industry has been omitted; asbestos, barytes, caustic soda, fossil flour, glue, lime, lithopone, magnesium oxide, sulphur, sulphuric acid, talc, zinc oxide, besides other items described and used in the rubber industry in less important degree. In spite of these more serious omissions which will doubtless be corrected in subsequent editions the volume will prove valuable for reference in commercial and industrial circles.

TRAINING IN THE RUBBER INDUSTRY. TRAINING BULLETIN No. 20, United States Department of Labor. United States Training Service; C. T. Clayton, Director. Government Printing Office, Washington, D. C., 1919. **(75 pages; 6 by 9 inches.)**

This bulletin devoted to training workers in the rubber industry has been prepared for the use of instructors in factory training and for factory managers desiring authoritative information on the subject. Much valuable information is contained in the first 17 pages concerning the various features of factory training such as the purposes in view, industrial relations, operation, methods, and supervision. Following some brief remarks on wild and plantation rubber the manufacturing operations are taken up. The operations involved in making rubber boots and various styles of shoes are explained in sequence with many illustrations, including the assembly of parts. Similarly the items of automobile tire manufacture are discussed, followed by a list of important defects to be covered by inspection.

The pamphlet closes with a bibliography on rubber drawn from books, pamphlets and periodicals in the Library of Congress, Washington, D. C., and compiled by the Research Section of the United States Training Service, April 1, 1919.

AN EXPORT ORDER AND ALLIED TOPICS. (SECOND EDITION.) Foreign Trade Department, National Association of Manufacturers, New York City. (Paper cover, octavo, 48 pages.)

This booklet is intended to show, by a series of letters, documents and forms, the successive steps involved in handling an export order, and gives in reproduction every detail of the transaction from the first inquiry of the customer to the receipt of payment and close of the transaction. Another section gives facsimiles of various forms used in connection with export shipments, consular requirements of foreign countries, and other information of interest to houses doing an export business. There is added to this some account of the workings of the National Association of Manufacturers, and the benefits accruing to members of that association.

NEW TRADE PUBLICATIONS.

The Buffalo Foundry & Machine Co., Buffalo, New York, has had the excellent idea of distributing to the rubber trade a colored peace map of Europe.

* * *

The Raybestos Co., Bridgeport, Connecticut, has started publication of a handsome house organ called "The Silver Edge," to acquaint dealers with the uses of its brake-lining and the method of application, and to bring about better cooperation between the manufacturers and their customers. The 16-page magazine is printed in two colors, is copiously illustrated with half-tones and well-drawn diagrams, introduces several of the company's salesmen, and includes other matter of special interest to automobilists and repair men. Another feature is a page in the form of a poster, which can be detached and hung up in the repair shop with advantage.

* * *

"The Mason Mail," published by The Mason Tire & Rubber Co., Kent., Ohio, after five months as a four-page bi-monthly will be expanded into a monthly publication of interest to outsiders as well as to those connected with the Mason organization. The same name will be retained and the first monthly issue will appear early in November. Charles V. Gilbert will continue to edit the publication.

* * *

A proof that the war is really over may be found in the sale by the Du Ponts of their war plants and equipment. The Du Pont Chemical Works of Wilmington, Delaware, issue a pamphlet containing lists of what they offer for sale. These include the grounds, buildings and fixtures of the big plants at Pompton Lakes, New Jersey, and at Hopewell, Virginia. The lists comprise many articles used in general manufacturing equipment from engines and elevators to bolts and nuts; also office, hospital and restaurant equipment.

* * *

The Gillette Rubber Co., Eau Claire, Wisconsin, has recently published two booklets, which have been distributed to all of the company. One is "The Square Deal," an introduction of the company to the employe. It tells what the company has done, is doing for the workers and what it may help them to do. It is a frank talk on the elements which will result in progress

and promotion, urging co-operation, and inculcating sound principles.

The other booklet outlines the principles and regulations of the Industrial Federation of the Gillette Rubber Co., which is described as "a democratic organization for the promotion of personal efficiency, a square deal to every member and establishment of just and fair dealing in all our relations with each other." Undoubtedly a study of these booklets must result in closer relations between the company and its employes.

* * *

THE MERCHANTS ASSOCIATION OF NEW YORK, YEAR BOOK, 1919: While much of the activity of the Association was devoted to war work, as S. C. Mead, the secretary, shows in his portion of this twenty-first annual report, the many branches of public welfare over which the various bureaus keep watch were by no means neglected. The readjustments needed by the return of peace have kept the many committees busy. The membership at the end of April was 5,881, the number of new members elected during the year being 824, the largest for any year since the Association was formed. The convenient lists of members according to their lines of business shows that 38 firms are engaged in the rubber trade. The year book is illustrated by photographs including an excellent likeness of W. Fellowes Morgan, president.

* * *

DR. O. DE VRIES OF THE EXPERIMENT STATION AT BUITENZORG, Java, has published an authoritative book on the preparation and the properties of plantation rubber (*"Bereiding en Eigenschappen van Plantage-Rubber," Vereeninging Centraal Rubberstation, Buitenzorg.*) It is highly praised in an appreciative review by Professor P. van Romburgh in *"De Indische Mercur."*

THE OBITUARY RECORD.

FOUNDED AN IMPORTANT INDUSTRY.

MAJOR WILLIAM WRIGHT HARRAL, who, with his brother, E. W. Harral, founded the Fairfield Rubber Co., at Fairfield, Connecticut, died recently at the home of his son in Mount Vernon, New York, aged 83 years. For some years he travelled in th West, selling rubber clothing and carriage cloth made by the company, and early in 1890 he took charge of the New York office and sales department on West Broadway and Franklin street, removing a year later to a larger building on Worth street. Ten years ago he retired from business, after over a quarter century of sevice for the industry he founded, and made his home with his son, George Harral.

Major Harral served honorably in the Civil War, taking part in the battle of Fort Sumter and several other important engagements, and later declined the offer of a very flattering position in the United States army.

FORMERLY A RUBBER MANUFACTURER.

Edward J. Slattery, who died in Boston last month at the age of 69, was at one time foreman of the cutting room of the Para Rubber Shoe Co., at South Framingham, Massachusetts, but being appointed postmaster of that town by President Cleveland he retired from the trade, and later devoted much of his time to public service.

He was for two terms a member of the State Senate and in 1898 was the Democratic candidate for Lieutenant-Governor of Massachusetts, and in more recent years served as secretary to James J. Curley, formerly mayor of Boston, during his term of office. He is survived by his widow and four sons.

A VETERAN RUBBER COMPANY BOOKKEEPER.

George W. Cummings, for many years connected with the Boston Rubber Shoe Co., died at the residence of his daughter in Brookline, Massachusetts, September 20, aged 77 years.

Mr. Cummings was of an old Boston family, the son of Daniel Cummings. He attended the public schools and on his graduation from the English High School, entered the employ of his brother, in the wholesale flour business, later becoming partner in the firm of Charles H. Cummings & Co.

He afterwards became associated with the selling company which was formed to distribute the lines of several rubber footwear factories, and when that concern was discontinued he took charge of the bookkeeping department of the Boston Rubber Shoe Co., which department he conducted until that company was purchased by the United States Rubber Co. After a total service of nearly 30 years with these companies, he retired with a pension.

Leisure, however, became irksome after a time, and for the last few years he had been connected with a furniture concern in Boston. For some time his health had been impaired, and an operation for cancer was but a temporary relief. He is survived by his widow, a daughter, and a son, Thomas C. Cummings, who is salesman in New England for the mechanical goods department of the United States Rubber Co.

A PIONEER IN RUBBER AND OILSKIN TRADE.

Edward Macbean of the firm of Edward Macbean & Co., Glasgow, a pioneer in the rubber and oilskin trade of Scotland, died recently. He founded the business in 1876 and soon began to specialize in water-proof goods and oilskins. The first factory was at Port Dundas. Some years later, mills were erected at Johnstone, near Paisley.

The Macbean oilskins are known throughout the world, particularly the heavy oilskin coats worn by seamen.

The Breece expedition to the North Pole was fitted out with special clothing and rubber materials made by the Macbean firm. The Brattice cloth used in coal mines were an improvement of Mr. Macbean.

Mr. Macbean was in the United States in 1910 and at that time was annoyed by a newspaper account of his condemning German artificial rubber, which he discovered through THE INDIA RUBBER WORLD.

DEATH OF A SUCCESSFUL JAPANESE BUSINESS MAN.

The death is announced of Genrijo Yonei, president of the Meiji Rubber Manufacturing Co., one of the most respected business men of Tokio, at the age of 58 years. Besides controlling the Goshi Kwaiska Yonei Shoten, Mr. Yonei was managing director of the Kirin Brewery Company, and a director of the Japan Sheet Glass Company, which were developed chiefly by his exertions.

TREASURY DECISIONS.

FOUNTAIN PENS TAXED AS JEWELRY.

Internal Revenue officials have decided that "a fountain pen ornamented, mounted, or fitted with precious metals or imitations thereof, or ivory, or pearls, precious and semi-precious stones or imitations," or even a fountain pen consisting of a plain rubber holder containing a gold pen point, is subject to the jewelry tax on the total price for which such pens are sold. The Revenue Act of 1918, section 905, imposes a tax of 6 per cent on the selling price of jewelry, whether real or imitation, including pencils and pens. The penalty to dealers who fail to collect and account for the tax is a fine of $1,000. (Treasury Decision No. 2893.)

CUSTOMS APPRAISER'S DECISIONS.

No. 38153.—Protest 817082 of American Chicle Company, (Detroit).

CHICLE.—Chicle sent from Mexico to Canada and there reduced to small pieces for convenience in transportation. Appraiser held it to be refined chicle and assessed duty at 20 cents per pound, according to paragraph 36 of Act of 1913. Claimed that

it was crude chicle, assessable at 15 cents by same paragraph. Opinion by McClelland, G. A. Chicle was not refined by any process. Protest sustained. (Treasury Decisions, Volume 37, No. 15.)

RUBBER TRADE INQUIRIES.

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

(752.) An export company desires the addresses of manufacturers of tires in millimeter sizes.

(753.) A reader asks for the address of manufacturers of wood calender shells.

(754.) An inquiry has been received for the address of a concern manufacturing rivetting machines for use in making outside boots for rubber tires.

(755.) A subscriber requests addresses of manufacturers of security or lug bolts for one-piece clincher rims on European cars.

(756.) A manufacturer asks where he can obtain the accelerator anhydrousformaniline.

(757.) An inquiry has been received as to buyers of uncured friction scrap.

(758.) A reader asks for the addresses of manufacturers of improved machines for making square-rolled packing, imitating the hand process of folding rubbered cloth so as to make a packing square throughout.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington D. C., or from the following district or cooperative offices. Request for each address should be on a separate sheet, and state number.

DISTRICT OFFICES.	COOPERATIVE OFFICES.
New York: 734 Customhouse	Cleveland: Chamber of Commerce.
Boston: 1801 Customhouse.	Cincinnati: Chamber of Commerce; General Freight Agent, Southern Railway, 96 Ingalls Building.
Chicago: 504 Federal Building	Los Angeles: Chamber of Commerce.
St. Louis: 402 Third National Bank Building	Philadelphia: Chamber of Commerce.
New Orleans: 1020 Hibernia Bank Building.	Portland, Oreg.: Chamber of Commerce.
San Francisco: 307 Customhouse.	Dayton, Ohio: Dayton Chamber of Commerce.
Seattle: 848 Henry Building.	

(30,667.) A man in Czecho-Slovakia requires tires for which he also desires to secure the agency. Send prices and catalogs. Payment in United States currency. Correspondence may be in English.

(30,737.) An American exporting company desires to purchase and secure agencies for the sale of rubber shoes and heels.

(30,756.) A commercial agent in Czecho-Slovakia desires to purchase and secure an agency for the sale of rubber goods, etc. Correspondence in Polish or French.

(30,766.) An agency is desired by a man in Belgium for the sale of hard rubber combs and novelties. Quotations should be given c.i.f. Antwerp. Terms cash, or 90 days preferred. Correspondence and catalogs should be in French.

(30,791.) A retail merchant in France desires to secure agencies for the sale of rubber, and rubber heels. Quotations should be given c.i.f. Havre or Bordeaux. Terms, cash against documents.

(30,817.) The representative of an American firm who is about to sail for Europe desires to secure agencies from manufacturers for the sale of automobile tires and rubber goods.

(30,818.) A firm in Spain desires to purchase on its own account and secure an agency for the sale of balata and mechanical rubber goods. Quote c.i.f. Spanish ports. Payment against documents, or 90 days' draft. Correspondence may be in English.

(30,821.) An agency is desired by a man in England for the sale of rubber goods of medium to good quality. Quote c.i.f. English ports.

(30,827.) A corporation in Canada desires to place orders for a large quantity of rubber footwear. Bank references.

(30,853.) A business man in Norway desires to secure an agency for the sale of rubber, rubber goods, etc. Quote c.i.f. Norwegian port. Payment through banks.

(30,896.) A merchant in Poland desires to secure agencies from American exporters and manufacturers for the sale of rubber dental appliances and supplies. Correspondence may be in English.

(30,915.) An American firm desires to purchase rubber boots and shoes from manufacturers for export to its clients in the Orient. Cash against documents.

(30,944.) A list of inquiries for American representation of rubber goods has been received from the American Consul at Valencia, Spain. Firms interested in this trade may secure copies of these lists upon application to the Bureau or its district offices.

(30,992.) A firm in Norway desires to secure an agency for the sale of automobile tires. Quote c.i.f. Norwegian ports. Terms, preferably 90 days.

(31,045.) A firm in Norway wishes to secure an agency for the sale of and to purchase rubber goods Quote c.i.f. Norwegian port. Payment through banks. Reference.

(31,057.) An American firm is sending an agent to Czecho-Slovakia to establish permanent agencies for rubber goods. Reference.

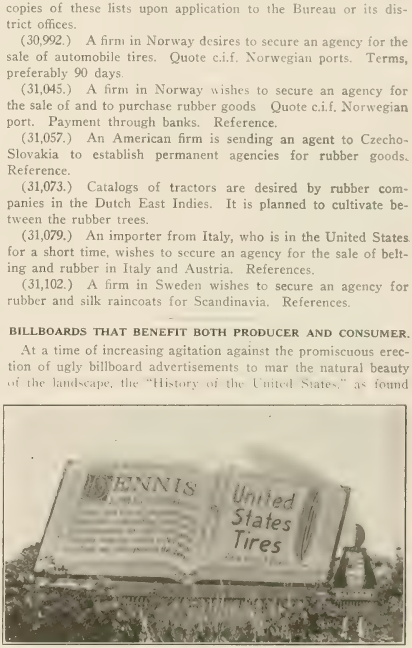
(31,073.) Catalogs of tractors are desired by rubber companies in the Dutch East Indies. It is planned to cultivate between the rubber trees.

(31,079.) An importer from Italy, who is in the United States for a short time, wishes to secure an agency for the sale of belting and rubber in Italy and Austria. References.

(31,102.) A firm in Sweden wishes to secure an agency for rubber and silk raincoats for Scandinavia. References.

BILLBOARDS THAT BENEFIT BOTH PRODUCER AND CONSUMER.

At a time of increasing agitation against the promiscuous erection of ugly billboard advertisements to mar the natural beauty of the landscape, the "History of the United States," as found



An Attractive and Informing Billboard.

in the form of billboards along the principal state roads throughout the country, stands forth as a notable exception.

These clever signboards not only advertise United States tires, but serve a useful purpose. They are attractive to the eye, helpful to the motorist and educational. They tell the distance to the next town and present interesting historic facts regarding it that

might otherwise remain unknown to the traveler. Their advertising aspect is subordinate to their convenience to the public, though none the less effective.

NEW INCORPORATIONS.

Assembled Tire Corp., October 17 (New Jersey), $100,000. T. P. Edwards, H. S. Baker, both of Roselle; D. L. Page, Hamplewood—all in New Jersey. Principal office, 266 Halsey street, Newark, New Jersey. Agent in charge, T. P. Edwards. To manufacture, repair, purchase, sell and deal in automobie tires and tubes.

Avon Tire & Rubber Co., October 6 (Delaware), $1,000,000. Mr. Bossom; B. Loewenstein; J. W. Cowell—all of Cincinnati, Ohio. Delaware agent, Capital Trust Co. of Delaware, Dover, Delaware. To manufacture and deal in automobile tires and inner tubes.

B. & G. Rubber Co., The, September 2 (Ohio), $25,000. G. H. Gualt, president and treasurer; D. H. Gualt, vice-president; H. V. Barrett, secretary and general manager. Principal office, Nankin, Ohio. To manufacture dipped goods and toy novelties.

Blaylock Tire & Rubber Co., G. E., September 25 (Maryland), $750,000. G. E. and A. G. Blaylock, both of 1811 North Charles street; C. E. Erdman, Hartford road & Erdman avenue—all of Baltimore, Maryland. Principal office, 1811 North Charles street, Baltimore, Mayland. To buy, sell, manufacture, vulcanize, repair and deal in rubber tires, etc.

Burke Tire Service, Inc., October 3 (New Jersey), $25,000. J. B. Burke; W. D. Danberry; M. A. Harkins—all of New Brunswick, New Jersey. Principal office, 7 Albany street, New Brunswick, New Jersey. Agent in charge, J. B. Burke. To manufacture, import, buy, and sell automobile accessories.

Cadillac Tire & Rubber Co., Inc., October 3 (New York), $500,000. J. L. Ranzenhofer, 244 Seventh street; H. Sancier and C. H. Blessing, both of 1834 Broadway—all of New York City. To manufacture tires.

Collins Tire & Rubber Co., Inc., October 9 (New York), $8,000. J. Jacobs; S. Bernheim; W. Loewenthal—all of 1877 Broadway, New York City. To manufacture tires.

Continent Tire & Rubber Co., Inc., October 9 (New York), $5,000. J. Jacobs; S. Bernheim; W. Loewenthal—all of 1877 Broadway, New York City. To manufacture tires.

Continental Auto Tire Co., Inc., October 4 (New York), $5,000. E. B. Grubel, J. P. Newman, both of 1447 Bryant avenue; E. Meyers, 80 Maiden Lane—all of New York City. To manufacture tires.

Corning Rubber Co., Inc., October 3 (New York), $50,000. W. H. Stetson, 172 West 105th street; F. C. Mullener, 2550 Bainbridge avenue, both of New York City; S. M. Buery, Flatbush, Brooklyn, New York. Principal office, Brooklyn, New York. To manufacture dental rubber.

Evans Tire & Reliner Co., August 11 (Indiana), $100,000. R. I. Evans; L. E. Ridgway; R. O. Beecoft—all of Fort Wayne, Inriana. Principal office, Fort Wayne, Indiana. To manufacture new automobile tires and tubes and to repair and rebuild old tires and tubes.

Greene Tire Sales Co., September 8 (Delaware), $25,000. T. L. Croteau; H. E. Knox; S. E. Dill—all of Wilmington, Delaware. Relaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture and deal in rubber tires, tubes and accessories for automobiles.

Hott-Dunham Rubber Co., The, May 12 (Ohio), $10,000. B. E. Lindsey, 106 Lexington avenue, president (not active); R. A. Dunham, 390 East Town street, vice-president; F. B. Hott, 85 Tulane Road, secretary, treasurer and general manager—all of Columbus, Ohio. Principal office, 120 East Long street, Columbus, Ohio. To repair and tread tires.

Jersey Cord Tire Corp., September 30 (New Jersey), $1,000,000. J. G. Hultin, Elizabeth; C. C. Eckrode, Newark; W. D. Reynolds, Cranford—all in New Jersey. Principal office, 118 Adams street, Newark, New Jersey. Agent in charge, C. C. Eckrode. To manufacture tires, tubes, and mechanical rubber goods.

K. B. Auto Supply Co., September 11 (New Jersey), $100,000. A. E. and I. Klinkowstein—all of 117 East Hanover street, Trenton, New Jersey. Principal office, 117 East Hanove rstreet, Trenton, New Jersey. Agent in charge, E. Klinkowstein. To buy, sell, and deal in automobile tires, tubes, and accessories.

Kolman Tire & Rubber Co., Inc., October 1 (New York), $25,000. J. Jacobs; S. Bernheim; C. A. Weldon—all of 1877 Broadway, New York City. To manufacture tires, etc.

Manufacturer's Tire & Rubber Co., Inc., September 22 (New York), $10,000. Jacob and Joseph M. Mazer, both of 8745 21st avenue; A. W. Tobey, 32 Glenmore avenue—all of Brooklyn, New York. Principal office, Brooklyn, New York. To manufacture tires.

McAdoo-Akron Co., The, July 12 (Ohio), $10,000. J. S. Pattie, 311 Ohio Building, president; G. H. Van Hyning, Corner East Market and Union streets, vice-president; C. K. Hoover, 769 Johnston street, secretary; H. C. Wissman, 317 Second National Building, general manager; T. O. McAdoo, 184 Annadale avenue, director—all of Akron, Ohio. Principal office, 317 Second National Building, Akron, Ohio. To manufacture cotton gloves, rubberizing cotton gloves, waterproofing gloves, and to deal in rubber.

Owensboro Tire & Rubber Co., Inc., October 9 (New York), $6,000. J. Jacobs; S. Bernheim; W. Loewenthal—all of 1877 Broadway, New York City. To manufacture tires.

Penn-ray Puncture Proof Interliner Co., October 13 (Delaware), $100,000. F. R. Hansell; J. Vernon Pimm, both of Philadelphia, Pennsylvania; E. M. MacFarland, Camden, New Jersey. Delaware agent, Corporation Guarantee & Trust Co., Ford Building, Wilmington, Delaware. To manufacture and deal in tires and tubes.

Planet Rubber Co., May 15 (California), $250,000. W. A. Jackson, 1015 South Main street, president; B. L. Vickrey, 308 South Hill street, vice-president; J. S. Wise, 936 South Albany street, secretary; J. C. Evans, 1017 West 53rd street, director; H. Levine, 623 North Vine street, director—all of Los Angeles, California. Principal office, 125 East Ninth street, Los Angeles, California. To manufacture "Planet" subtire, tires, tire accessories, and vulcanizers' supplies.

Poston Tire & Rubber Co., Inc., October 9 (New York), $5,000. J. Jacobs; S. Bernheim, W. Loewenthal—all of 1877 Broadway, New York City. To manufacture tires.

Pow-Den Tire Corp., The, October 3 (New York), $25,000. M. J. and I. Powsner, both of 44 Linden Park; F. B. Denison, 505 Forest avenue—all of Buffalo, New York. Principal office, Buffalo, New York. To manufacture tires.

Puritan Rubber Co., Inc., September 11 (Washington), $500,000. G. Lloyd, president; F. C. Plouf, vice-president, treasurer and purchasing agent; O. P. McElmeel, secretary. Principal office, 401-402 Railway Exchange Building, Seattle, Washington. To manufacture "Pathfinder" casings, tubes and accessories.

Renniebut Rubber Co., Inc., October 6 (New York), $10,000. P. E. Wish; C. H. Tisserand; W. R. Waite—all of 13 Park Row, New York City. To manufacture rubber goods.

Resilent Auto Tire Co., September 11 (Wisconsin), $100,000. C. Uhrinecz; J. Hornyak; E. A. Makal. Principal office, Milwaukee, Wisconsin. To manufacture auto tires and supplies.

Rubbermetal Co., Inc., September 25 (Maryland), $100,000. G. H. Pembroke, 663 West Fayette street; M. and E. Tretick, both of 9 South Exeter street—all of Baltimore, Maryland. Principal office, 210 East Lexington street, Baltimore, Maryland. To manufacture, buy, sell, deal in automobile tires, tubes, etc.

Sabine Tire & Rubber Co., Inc., October 6 (New York), $5,000. J. Jacobs; S. Bernheim; W. Loewenthal—all of 1877 Broadway, New York City. To manufacture tires.

Specialty Rubber Works, Inc., September 4 (New Jersey), $10,000. H. Morris, 1500 Boston Road; L. Bunzl, 121 East 72nd street; R. L. Lyon, 2767 Marion avenue—all of New York City. Principal office, Hedenberg Works, Plane street, Newark, New Jersey. To manufacture and deal in rubber goods.

Tire Accessories Mfg. Co., Inc., Setpember 29 (New York), $14,000. E. D. Loewenthal, 135 West 36th street; H. H. Plotkin, 99 Forsyth street—both in New York City; I. J. Rifkin, 37th street and Mermaid avenue, Coney Island—both in New York. Principal office, Long Island City, New York. To manufacture tires.

United States Victor Fountain Pen Co., Inc., The, June 4 (New York), $30,000. E. Hugetz, president. Principal office, 115 Worth street, New York City. To manufacture fountain pens.

Victory Rubber Manufacturing Co., The, July 14 (Georgia), $500,000. A. P. Phillips, G. J. Reuter, and E. W. Van Duzen—all of Atlanta, Fulton County, Georgia. Principal office, Atlanta, Fulton County, Georgia. To manufacture mechanical rubber goods and other rubber products.

Walter Jeanne, Inc., September 26 (New York), $5,000. Dr. J. W. and P. A. Appleton, and M. Goode—all of 353 Fifth avenue, New York City. To manufacture rubber goods and apparel.

Wayne Tire & Rubber Co., May 16 (Ohio), $600,000. H. T. Auerbach, Buffalo, New York, president; E. C. Love, secretary and treasurer; H. R. Platt, general manager, both of Orrville, Ohio. Principal office, Orrville, Ohio. To manufacture automobile tires and tubes.

Western Kentucky Tire Co., The, June 4 (Kentucky), $50,000. O. Goodwin, president; L. Goodwin, vice-president; A. K. Goodwin, secretary and treasurer—all of Hopkinsville, Kentucky. Principal office, Hopkinsville, Kentucky. To distribute Diamond tires and accessories and to manufacture Sure-Grip and Devil-Grip patching kits.

Winston-Salem Tire & Rubber Co., Inc., October 9 (New York), $5,000. J. Jacobs; S. Bernheim; W. Loewenthal—all of 1877 Broadway, New York City. To manufacture tires.

Wyoming Sales Co., October 13 (Delaware), $500,000. F. R. Hansell; J. Vernon Pimm, both of Philadelphia, Pennsylvania; E. M. MacFarland, Camden, New Jersey. Delaware agent, Corporation Guarantee & Trust Co., Ford Building, Wilmington, Delaware. To manufacture and deal in all kinds of rubber goods.

Wyoming Tire & Rubber Co., October 13 (Delaware), $500,000. F. R. Hansell; J. V. Pimm, both of Philadelphia, Pennsylvania; R. M. MacFarland, Camden, New Jersey. Delaware agent, Corporation Guarantee & Trust Co., Ford Building, Wilmington, Delaware. To manufacture and deal in all kinds of rubber goods.

Zonta Tire & Rubber Co., August 22 (Iowa), $1,500,000. T. P. Scott, president; H. A. Ritchie, vice-president; F. J. Simmons, treasurer; H. W. Caldwell, secretary. Principal office, Sioux City, Iowa. To manufacture tires and tubes.

STATEMENT OF THE INDIA RUBBER WORLD.

Statement of the ownership, management, etc., required by the Act of Congress of August 24, 1912, of THE INDIA RUBBER WORLD, published monthly at New York, New York, for October 1, 1919.

State of New York, }
County of New York. } ss.:

Before me, a notary public in and for the State and county aforesaid, personally appeared E. M. Hoag, who, having been duly sworn according to law, deposes and says that she is the business manager of THE INDIA RUBBER WORLD, and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are:

Publisher, The India Rubber Publishing Co., 25 West Forty-fifth street, New York City.

Editor, Henry C. Pearson, 83 Agawam Road, Waban, Massachusetts.

Managing Editor, Henry C. Pearson, 83 Agawam Road, Waban, Massachusetts.

Business Manager, E. M. Hoag, 25 West Forty-fifth street, New York City.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.)

Henry C. Pearson, 83 Agawam Road, Waban, Massachusetts.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person, or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other secuities than as so stated by her.

E. M. HOAG, Business Manager.

Sworn to and subscribed before me this 30th day of September, 1919.

[SEAL] FREDK. SPRENGER,
Notary Public, Westchester County.
Certificate filed in New York County.

My commission expires March 30, 1920. New York County Clerk. No. 186. Register No. 10188.

News of the American Rubber Industry.

FINANCIAL NOTES.

The entire amount of the offering of $36,000,000 of the United State's Rubber Co.'s common stock was subscribed for without calling upon the underwriters to take any part. Subscribers for only $2,316,550 par value availed themselves of the opportunity to pay in four instalments, the other stockholders preferred to pay $33,683,450 par value in full on October 1.

The statement of the United States Rubber Co. and its subsidiaries for the six months ended June 30, 1919, shows surplus after charges and federal taxes of $10,815,750, equivalent after preferred dividends to $23.01 a share on $36,000,000 common stock. This compares with $10,283,025, or $21.64 a share in the corresponding period of 1918:

	1919.	1918.
Total sales	$99,489,372	$108,515,725
General expenses and ordinary taxes	77,144,870	82,439,561
Operating profits	22,344,502	26,076,164
Interest charges, etc	4,852,606	11,991,289
Federal and Canadian taxes	6,676,146	3,801,850
Net profits	10,815,750	10,283,035
First preferred dividends	2,508,484	2,468,888
Second preferred dividends	12,108	12,108
Subsidiary companies dividends	9,308	9,320
Surplus	8,285,850	7,792,709
Previous surplus	41,848,051	31,891,207
Total surplus	50,133,901	39,683,916
Items applying to prior period	....	40,660
Profit and loss surplus	50,133,901	39,643,256

The Boston Woven Hose & Rubber Co.'s balance sheet as of September 1, 1919, shows a surplus of $2,035,183, an increase of $352,986 over last year. After the signing of the armistice the Government cancelled many orders. This left a large inventory on the company's hands, which has now been reduced $362,851 to $2,675,225. It has increased its working capital during the year by $514,099, the total now being $3,439,598, and is free from debt. During the year the company began to manufacture automobile tops. This business has proved very profitable and will be largely increased in volume.

The company's balance sheet, compared with that for 1918, is as follows:

Assets.	September 1.	
	1919.	1918.
Patents	$1	$1
Office furniture	1	1
Land and buildings	1,502,130	1,558,982
Machinery and tools	943,493	987,414
Cash	581,118	420,770
Accounts receivable	1,228,073	1,351,472
Liberty bonds	410,376	250,649
Inventory	2,675,255	3,038,106
Total	$7,450,409	$7,607,395
Liabilities.		
Preferred stock	$750,000	$750,000
Common stock	3,100,000	3,039,700
Bills payable	790,000	1,552,000
Liberty bonds (loans)	325,000	....
Accounts payable	253,257	309,044
Taxes	65,101	255,082
Accrued wages	21,866	19,372
Surplus	2,035,183	1,682,197
Total	$7,340,409	$7,607,395

The Goodyear Tire & Rubber Co., Akron, Ohio, recently announced that the $15,000,000 worth of second preferred eight per cent stock which was issued during the war was to be called in at 105 on November 1. It offered to each employe the opportunity to subscribe for any number of shares up to twenty of its preferred non-assessable seven per cent cumulative stock, for which payment will be accepted at the rate of $4 monthly per share, to be deducted from salaries, payments to be completed within two years, subject to an interest charge on deferred payments. Quarterly dividends of one and three-quarters per cent will be paid on the full par value of stock subscribed for. Special inducement will be offered to subscribers to hold stock. Subscriptions started October 29 and closed November 1, the total number of subscribers in the factory and office being 16,016 and their subscriptions amounting to $6,746,800. This did not include the plants in Canada, Arizona, or California.

It has become known that the Mason Tire & Rubber Co., Kent, Ohio, has a plan under way for increasing its capital stock to $7,500,000. No definite announcement has been made, but it is understood that sales for the time being are to be restricted to present stockholders.

The Firestone Tire & Rubber Co., Akron, Ohio, is issuing $10,000,000 of seven per cent preferred stock for the purpose of enlarging its plant. The immediate purpose of the issue is to provide the company with additional working capital, to construct a new mechanical building and a new steel rim plant, and to furnish additional equipment for plant No. 2 to increase its output, which consists of 3½-inch tires and tubes exclusively. The present output is 22,000 tires and 25,000 tubes a day; the additional equipment will raise this to 36,000 tires and 40,000 tubes daily. In the last complete eight years the amount of net sales and net earnings after preferred stock dividends had been paid were as follows:

	Net Sales.	Net Earnings.
1918	$75,801,507	$4,664,615
1917	61,587,219	4,619,298
*1916	44,135,326	5,837,021
1915	25,319,476	4,447,271
1914	19,250,110	3,157,719
1913	15,720,907	1,558,059
1912	11,683,200	1,126,911
1911	7,462,581	566,752

* Fifteen months—end of fiscal year changed from July 31 to October 31.

For the nine months, November 1, 1918, to July 31, 1919, the net sales amounted to $59,145,396, and for the month of August the net sales were over $10,000,000, the largest amount in the company's history, exceeding greatly the total year's sales of nine year's ago.

The Goodyear Tire & Rubber Company of California has issued $2,000,000 more of seven per cent preferred stock in addition to the $6,000,000 put on the market in July, making eight million out of the ten million authorized.

The company has acquired 440 acres of ground at Los Angeles adjacent to the 600 acres, forming Ascot Park, that were first acquired. On this will be built also the plant of another subsidiary of the Akron parent company, the Pacific Cotton Mills Co., that will manufacture the cotton fabrics which enter into the construction of tires and other rubber products from the cotton grown in Arizona and Southern California. The Pacific Cotton Mills Co. has just issued $2,000,000 of seven per cent preferred stock, out of $3,000,000 authorized. The plant is expected to run 33,000 spindles.

Shares of The Fisk Rubber Co. are active, as the statement for the first eight months of 1919 is expected to be very favorable. Sales are amounting to more than $5,000,000 a month so that last year's total of $36,000,000 will be far surpassed. When the additions to its manufacturing equipment at Chicopee Falls are completed the company will be able to turn out 15,000 tires a day. For the last five years, surplus profits have been turned back into the business, but the directors now believe that a dividend on the common stock can be paid. This will be done probably before the new year.

The balance December 31, 1918, of $4,425,923 had become $8,009,143 by September, 30, 1919, and the profits from January 1 through September 30, 1919, were $4,199,399.

The Hodgman Rubber Co., whose factories are at Tuckahoe, New York, is issuing $1,000,000 of 8 per cent convertible cumulative preferred stock. The concern dates from 1838 and is the oldest in the manufacture of rubber goods in the United States.

The McGraw Tire & Rubber Co. has applied to be listed on the Cleveland Stock Exchange. Its present capitalization is $840,000 of 7 per cent cumulative preferred stock and $1,950,050 of common stock. This will be changed into an issue of 100,000 shares of common stock of no par value and $2,500,000 of preferred stock, with $5,000,000 authorized. This will be used to withdraw the old preferred stock, the remainder for working capital. Each holder of common stock will receive two new shares for each share of $50 par value.

The McGraw Tire & Rubber Co. has been in existence ten years, manufacturing cord and fabric automobile tires, truck tires and inner tubes. The net sales, which were $746,000 in 1912, will be over $7,000,000 in 1919. It has paid 12 per cent dividends on its common stock for the last three years.

The Phoenix Rubber Co., Akron, Ohio, that was organized in March, 1916, for the purpose of reclaiming rubber, is issuing $200,000 of 7 per cent preferred stock of a par value of $100 a share and $100,000 of common stock at $25 a share. Common stock will be sold only to purchasers of preferred stock at the rate of two shares of common stock for one of preferred.

The proceeds of the new issue will go into new buildings and equipment. One large three-story building planned will turn out 300 tires, 900 tubes, 20,000 pairs of soles, 20,000 pairs of heels, and 20,000 of other rubber products a day.

The Goodyear Tire & Rubber Co., Akron, Ohio, has sold $40,000,000 of a total authorized issue of $100,000,000 seven per cent cumulative preferred stock to a group of Cleveland, New York and Chicago bankers. The proceeds will be used to retire its two outstanding issues of preferred stock. The new stock will be offered for subscription at $100 a share and accrued dividends and holders of present Goodyear stock, first and second preferred and common will have the preference.

REFINANCING PLANS OF STANDARD TIRE CO.

The Standard Tire Co., Willoughby, Ohio, is paying a 50 per cent stock dividend out of surplus and selling $350,000 additional stock to its present stockholders; one-half of this is common and the other half preferred. It is also increasing the common from $350,000 to $1,000,000 and the preferred from $150,000 to $500,000.

About the first of the year R. J. Firestone, Tom A. Palmer, and E. A. Tinsman associated themselves together, interested Akron capital, and purchased the plant of the old Standard Tire & Rubber Manufacturing Co. at Willoughby, Ohio. The refinancing which has taken place is due to increased business requiring additional funds to handle the growing demand for the company's tires. In the last three months, the concern has more than doubled its output and with the additional capital will now be able to increase it materially.

DIVIDENDS.

The Advance Rubber Co., Brooklyn, New York, recently declared its semi-annual divedend of four per cent, payable September 10 on stock of record June 30, 1919.

The American Chicle Co., New York City, has declared a dividend of one per cent, payable November 1 on stock of record October 21, 1919.

The American Zinc, Lead & Smelting Co., St. Louis, Missouri, and New York City, has declared its quarterly dividend of $1.50 per share, payable November 1 on preferred stock of record October 24, 1919.

The Ames-Holden-McCready Co., Montreal, Quebec, has declared its quarterly dividend of one and three-quarters per cent, payable October 1 on preferred stock of record September 19, 1919.

The Brunswick-Balke-Collender Co., Chicago, Illinois, has declared its quarterly dividend of one and three-quarters per cent, payable October 1 on preferred stock of record September 20, 1919.

The Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, has declared its quarterly dividend of one and three-quarters per cent, payable September 30 on preferred stock of record September 24, 1919.

E. I. du Pont de Nemours & Co., Wilmington, Delaware, have declared a dividend of one and one-half per cent, payable October 25 on its debenture stock of record October 10, 1919.

The General Electric Co., Schenectady, New York, has declared its quarterly dividend of two per cent, payable October 15 on stock of record September 15, 1919

The General Tire & Rubber Co., Akron, Ohio, has declared its quarterly dividend of one and three-quarters per cent, payable October 1 on preferred stock of record September 20, 1919.

The Goodyear Tire & Rubber Co., Akron, Ohio, has declared its quarterly dividend of one and three-quarters per cent, payable October 1 on first preferred stock of record September 15, 1919.

The Hawkeye Tire & Rubber Co., Des Moines, Iowa, has declared a dividend of eight per cent, payable October 15 on stock of record October 1, 1919.

The Hood Rubber Co., Watertown, Massachusetts, has declared its forty-seventh consecutive quarterly dividend of one and three-quarters per cent, payable November 1 on preferred stock of record October 21, 1919.

The Kelly-Springfield Tire Co., New York City, has declared the following quarterly dividends: cash, $1 per share, and stock dividend of three per cent, payable November 1 on common stock of record October 18; an initial dividend of $2 per share, payable November 15 on eight per cent preferred stock of record November 1, 1919.

The Keystone Tire & Rubber Co., New York City, has declared its quarterly dividend of three per cent, payable October 1 on stock of record September 19, 1919.

The National Aniline & Chemical Co., New York City, has declared its quarterly dividend of one and three-quarters per cent, payable October 1 on preferred stock of record September 15, 1919.

The New Jersey Zinc Co., New York City, has declared a quarterly dividend of four per cent, payable November 10 on stock of record October 31, 1919.

The Owen Tire & Rubber Co., Cleveland, Ohio, has started payment of accrued dividends on preferred stock, checks being sent to stockholders who have paid for stock bought during the last quarter of 1917 and the first quarter of 1918. In December the company expects to pay accrued dividends on stock bought and paid for during the second and third quarters of 1918, and will continue this policy until all accrued dividends on preferred stock shall have been paid.

The Portage Rubber Co., Akron and Barberton, Ohio, has declared its regular quarterly dividend of three per cent, payable November 15 on common stock of record November 5, 1919.

The Tyer Rubber Co., Andover, Massachusetts, declared its regular quarterly dividend of $1.50 per share, payable October 15, 1919, on common stock.

The United States Rubber Co., New York City, has declared its quarterly dividend of two per cent on its first preferred stock and a dividend of two per cent on common stock, both payable October 31 on stock of record October 15, 1919. The common stock dividend is the first since the interruption by the war and is accompanied by the declaration that it is the intention of the company now to place its common stock on a regular eight per cent basis.

The Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, declared its quarterly dividends of two per cent, payable October 15 and 31st, respectively, on preferred and common stock of record October 3, 1919.

RUBBER COMPANY SHARE QUOTATIONS.

The following rubber stock quotations on October 18, 1919, are furnished by John Burnham & Co., 41 South La Salle street, Chicago, Illinois:

	Bid.	Asked.
Ajax Rubber Co., Inc.	95¾	96¾
Brunswick-Balke-Collender Co., preferred	103	...
Du Pont de Nemours & Co., E. I., common	315	320
Du Pont de Nemours & Co., E. I., debentures	91	93
Firestone Tire & Rubber Co., common	178	180
Firestone Tire & Rubber Co., preferred	98	100
Fisk Rubber Co., The, common	51	52
Fisk Rubber Co., The (new), first preferred	98	101
Fisk Rubber Co., The, 2nd preferred	190	200
Goodrich, B. F., Rubber Co., The, common	82½	83½
Goodrich, B. F., Rubber Co., The, preferred	103⅞	104⅞
Goodyear Tire & Rubber Co., The, common	395	402
Goodyear Tire & Rubber Co., The, first preferred	109	111
Kelly-Springfield Tire Co., common	153	154
Kelly-Springfield Tire Co., first preferred	95	97
Lee Tire & Rubber Co.	29½	30½
Marathon Tire & Rubber Co.	...	55
Miller Rubber Co., The, common	188	195
Miller Rubber Co., The, preferred	103	106
Rubber Products Co., The, common	135	140
Portage Rubber Co., The, common	136	141
Swinehart Tire & Rubber Co.	87	90
United States Rubber Co., common	122½	123½
United States Rubber Co., preferred	116½	117½

RUBBER INDUSTRIES ATHLETIC LEAGUE BASKET-BALL TOURNAMENT.

Since the close of the baseball season the Rubber Industries Athletic League has turned its attention to basket ball to which it will devote Friday evenings throughout the winter.

It is the intention of the League officials to put on the floor a team which will compare favorably with any team that ever passed a ball. Only one team will be formed from the entire league membership which will represent the League as a body. The line-up will include such well-known stars as Ruckert and Studebaker of Firestone, Reich and Dreyfus of United States and Belsky of Ajax.

The court at Savage's Gymnasium on 60th street near Broadway, in the heart of the rubber district of New York, has been secured for each Friday evening during the season, beginning November 21.

WINNERS OF THE WATCH FOBS.

The baseball players, whose individual records during the season won for them the watch fobs presented by A. G. Spalding & Brother were: A. J. Savarese, Ajax Tire & Rubber Co., Inc.; L. A. Mayborn, Kelly-Springfield Tire Co., W. Ruckert and C. D. Studebaker, Firestone Tire & Rubber Co.; L. Abbott and H. Knox, The Goodyear Tire & Rubber Co.; E. Head, E. Reich, J. Walsh, and J. Savage, United States Rubber Co.; and J. Gray, P. Teed, and G. Scott, The B. F. Goodrich Co.

GAS MASKS FOR INDUSTRIAL USE.

The gas mask is rapidly finding its proper place in the industries. Experience has shown that it has a wide application in protecting workmen from the noxious gases and fumes given off in many chemical operations. In rubber factories gas masks could be used around volatile solvents, such as carbon disulphide, carbon tetrachloride, sulphur chloride and certain organic accelerators. In allied chemical plants they give good protection in pyrite smelting and roasting operations wherever sulphur dioxide or oxides of nitrogen are encountered. The war gave great impetus to the development of better gas masks, and now the Bureau of Mines has established a gas mask department at the Pittsburgh Experiment Station, where masks of the army type will be developed for industrial use.

AMERICAN ZINC, LEAD & SMELTING CO.'S NEW PLANT.

The American Zinc, Lead & Smelting Co., of St. Louis, Missouri, having found its zinc oxide plant at Hillsboro, Illinois, too small to fill the growing demands for its output, has decided to build a new plant at Columbus, Ohio, on a 40-acre tract of land bordering on the Akron division of the Pennsylvania railroad. Construction will be pushed, and it is hoped to have the works ready for operation by January 1, 1920.

At this plant will be manufactured the Azo ZZZ brand of zinc oxide, and zinc ores free from lead for making this grade will be shipped from the company's mines at Mascot, Tennessee. The company has other mines at Joplin, Missouri, and Platteville, Wisconsin, and smelters at East St. Louis and Hillsboro, Illinois; Caney, Kansas; and Granby, Missouri.

WILLIAM D. ANDERSON HEADS BIBB MANUFACTURING CO.

At the recent annual meeting of the Bibb Manufacturing Co., maker of tire fabrics, Macon, Georgia, William D. Anderson was elected president; E. T. Comer, chairman of the board of trustees; J. H. Porter, vice-president; J. I. Comer, second vice-president; Charles H. Williams, secretary and treasurer, and A. A. Drake, assistant treasurer. John A. Porter continues as general superintendent of the four mills at Macon, two at Porterdale, one at Columbus and another at Reynolds.

Extensive improvements are being made at Columbus and in one of the Macon mills, and an auditorium and other community features are to be built in each of the mill villages in Macon. Bonuses have been paid to faithful employes according to period of service from three to ten years. The usual dividends were declared at the annual meeting.

NEW EXPRESS PACKING RULES.

Effective December 10 the use of paper wrapping for express packages weighing over 25 pounds will not be permitted. Ordinary paper boxes, wrapped or unwrapped, are also forbidden. For shipments over 25 pounds, wooden containers, or containers of fiberboard, pulpboard or corrugated strawboard material are required. The cartons must be made of materials of specified "test strengths," similar to those required for the freight service, and the containers must bear the stamp of the manufacturers certifying that the material used is of strength required for the weight of the shipment carried in it, as called for in the rules. Shippers are requested to study Supplement No. 5 to Express Classification No. 26, in which these rules are embodied, and copies of which may be secured at any express office.

STANDARDIZATION OF GOLF BALLS.

At its first meeting since 1914 the British Golf Rules Committee resolved to submit to the association a new rule standardizing golf balls. Changes in rules by the English authorities are usually followed in America, and golf ball standardization will hardly be an exception. Such an innovation, it is believed, would pave the way for a firmer foundation for international play. With plans in the making in both England and the United States, and entries being booked for the 1920 championships next season may witness all titular play with a standard golf ball.

RUBBER STAMPS AID ARCHITECTS AND DRAFTSMEN.

Rubber stamps are being made that represent interior fittings, such as bath tubs, kitchen sinks with the faucets and so on, which should be convenient for architects and draftsmen who have to draw the same thing over and over again in different parts of a plan. The stamp prints the outline drawn to standard scale, and the impression can be touched up as required. Though only used for plumbing fixtures at present, the stamp offers possibilities for much wider application to parts of drawings that must be repeated frequently.—("Popular Mechanics.")

PERSONAL MENTION.

Duffy and Sears, who have recently opened offices at 133 Front street, New York, as crude rubber brokers, are progressive young men who have grown up in the crude rubber business.

L. A. Duffy.

L. A. Duffy began his rubber career with the New York Commercial Co. in 1902 and was transferred from New York in 1907 to Manáos where he remained two years with A. H. Alden & Co., the parent concern of the New York Commercial Co. From 1913 to 1916 he was connected with W. R. Grace & Co., New York City, resigning to go with the Hagemeyer Trading Co. as assistant manager of the crude rubber department. Here he remained for two years and after a few months with J. Frank Dunbar, New York City, resigned to form the partnership with Mr. Sears.

S. H. Sears.

S. H. Sears also served his apprenticeship with the New York Commercial Co., from 1903 to 1911, when he went to the Firestone Tire & Rubber Co., Akron, Ohio, as a crude rubber expert, and in 1916 was sent to the Far East, visiting the Malay Peninsula, Java, and Sumatra, in the interest of the Firestone company. Mr. Sears was assistant manager of the Firestone crude rubber department when he resigned to engage in business with Mr. Duffy.

The following appointments have been made by The B. F. Goodrich Co., Akron, Ohio: Edward H. Fitch, for three years manager of Philadelphia branch, promoted to the position of manager of manufacturers' sales for the entire Goodrich line, with headquarters at Akron; C. H. Smith, for twenty years in charge of Diamond sales in Chicago and the mid-west district, promoted to managership of Chicago branch, in charge of both Goodrich and Diamond tire sales and the entire Goodrich line of products; N. E. Oliver, for some years in charge of Diamond sales in the New York district, appointed manager of the New York branch, supervising sale of all Goodrich products and retaining supervision of Diamond sales; E. P. Rowen, for fourteen years manager of Chicago branch, appointed manager of Diamond tire sales for the United States, with headquarters at Akron; and H. J. Morehead, for four years manager of the New York branch, promoted to manager of Philadelphia branch, in charge of sale of both Goodrich and Diamond tires and the entire Goodrich line of products.

F. K. Stephenson has been appointed export manager of The Portage Rubber Co., Akron and Barberton, Ohio, with headquarters in New York City. He was formerly export manager for the Republic Rubber Co. in the same city.

B. C. Swinehart has resigned as general manager of the United & Globe Rubber Co., Trenton, New Jersey, and will return to Akron, Ohio, where for six years he was with the Swinehart Tire & Rubber Co.

L. G. Chase, formerly efficiency engineer of the Rosemary Manufacturing Co., Rosemary, North Carolina, has been appointed mechanical engineer of the Yarnall-Waring Co., Chestnut Hill, Philadelphia, Pennsylvania.

E. V. Peters, general sales manager of The New Jersey Zinc Co., New York City, will spend a month in the West, accompanied by R. M. Neumann, of the Chicago office, manager of western sales, and will visit among other cities, Denver, San Francisco, Los Angeles, Portland (Oregon), and Seattle.

C. T. Anderson has been appointed manager for The Portage Rubber Co., Akron and Barberton, Ohio, succeeding B. Anderson-Smith, resigned, at Philadelphia, Pennsylvania.

S. B. Woodbridge has been made director of sales of the lithopone, dry colors and pigment division of E. I. du Pont de Nemours & Co., Wilmington, Delaware. He had been identified with Harrison Bros. & Co., Philadelphia, for ten years previous to the taking over of that concern by the Du Pont company, and was also sales manager for the Beckton Chemical Co., manufacturer of lithopone and allied with the Harrison company at the time both were taken over by the Du Pont company.

Leslie E. Freeman has been appointed resident representative of the American Chamber of Commerce for Brazil in the United States, with offices at 37 Liberty street, New York City.

Curtis L. Moody, for the past four years with The Fisk Rubber Co., Chicopee Falls, Massachusetts, and manager of the schedule and mold engineering department since its establishment two and one-half years ago, has resigned to accept an executive position with The Perfection Tire & Rubber Co., Fort Madison, Iowa.

E. T. Peterson has been appointed manager of the Buffalo, New York, branch of the Pennsylvania Rubber Co., Jeannette, Pennsylvania.

Captain Harry B. Tuttle has been appointed special representative for bicycle and motorcycle tires and tennis balls manufactured by the Pennsylvania Rubber Co., with headquarters at Jeannette, Pennsylvania.

E. H. Fitch.

C. H. Smith.

N. E. Oliver.

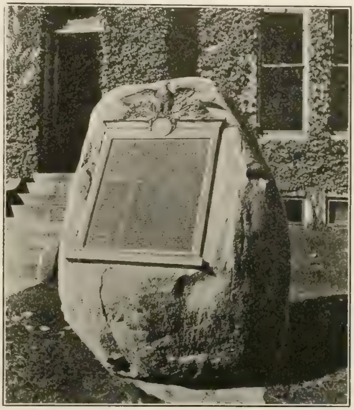
E. P. Rowen.

H. J. Morehead.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

An increase of $20,960,780 in all kinds of property values in Providence is shown by the official assessment of the Board of Tax Assessors for the year 1919. In the list of more than 1,000 individuals, grms and corporations that are assessed upon a valuation of $50,000 or more are the following that are directly, or indirectly, associated with the rubber industry: American Multiple Fabric Co., $94,380; Augustus O. Bourn, $84,640; Bourn Rubber Co., $272,580; Walter S. Ballou, $87,640; Joseph Banigan estate, $1,045,580; Samuel P. Colt, $219,060; Mary E. Davol, widow of Joseph Davol, $834,500; Davol Rubber Co., $500,000; Glendale Elastic Fabric Co., $117,300; International Braid Co., $1,079,320; William B. McElroy et ux, $118,100; Mechanical Fabric Co., $202,500; Revere Rubber Co., $1,346,200; Rhode Island Hospital Trust Co., trustee under the will of Joseph Davol, $465,100; James E. Sullivan (trustee), $288,780; United States Rubber Co., $1,651,960.



War Memorial Erected at the Alice Mill of the Woonsocket Rubber Co.

The Revere Rubber Co., Providence, has purchased additional land at Valley and Eagle streets, aggregating nearly 35,000 square feet for the purpose of enlarging its plant. This with the land already owned gives the company a tract containing more than 1,000,000 square feet.

The property of the American Locomotive Works, containing about 450,000 square feet, was acquired more than a year ago and the rebuilt and new structure were recently put in operation for the manufacture of light rubber goods, especially druggists' sundries.

Since taking over the old Banigan Rubber Co.'s plant several years ago the Revere Rubber Co. has steadily increased its plant. The original factory buildings are now used for the manufacture of solid rubber tires for motor trucks, the production of pneumatic tires and tubes having been transferred to other plants of the United States Rubber Co., which controls the Revere Rubber Co

Work was commenced during the past month on new buildings that will add nearly 60,000 square feet of floor space and cost approximately $200,000. One of the new buildings will be used for laboratory purposes and the other for manufacturing. Both buildings will be of concrete and steel, three stories high. The laboratory building will be 150 by 50 feet and the manufacturing building, 120 by 100 feet.

Another forward step in the movement for the welfare of its employes has been taken by the National India Rubber Co., at Bristol, by the installation of an excellent dental equipment. The outfit consists of a sterilizer and stand, an air compressor, unit equipment and dental chair, an aseptic table stand, dental cabinet, a Bosworth light and a gas oxygen outfit. Employes may have dental work performed at only a nominal fee to help cover the cost of material used. Dr. M. J. O'Brien is in charge.

A legal department has also been established which is to be conducted for the sole interests of the employes of the corporation. Judge Frank H. Hammill, attorney-at-law, has been engaged to maintain an office at the company's plant where he will spend a portion of every working day. Legal advice concerning personal and property rights will be provided without charge.

The Glendale Elastic Fabric Co. has commenced extensive alterations and repairs at its four-story building in Providence.

The Davol Rubber Co. has commenced the erection of a one-story pumping house at its plant in Providence.

P. Raymond Wesley has been made general manager of the Davol Rubber Co., Providence, succeeding Edwin M. Caldwell who resigned October 1. Mr. Wesley has been with that company in responsible positions for about 25 years.

Day and night shifts are being employed at the International Rubber Co.'s plant in West Barrington, owned by the O'Bannon Corporation, owing to the pressure in the market for carriage cloth, one of the products of this concern.

A twelve-ton boulder has been placed on the lawn in front of the office of the Alice Mill of the Woonsocket Rubber Co., facing Fairmount street, Woonsocket, upon which has been mounted a bronze honor roll tablet of the employes of that corporation who went from the Alice Mill into various branches of the country's service during the World War. It bears the names of 90 employes. The memorial was dedicated with appropriate exercises on Saturday, October 11, in the presence of the entire force

The Woonsocket Rubber Co. has received recognition from the United States Government for taking back into its employ every former worker who went into military or naval service, who applied for his place upon returning. Of the employes who went into service, more than two-thirds are reported as being back at their old jobs or better ones.

WESLEY APPOINTED GENERAL MANAGER.

The appointment of P. R. Wesley to the position of general manager of the Davol Rubber Co., Providence, Rhode Island, was a natural and fully deserved promotion of one who had risen step by step during a service of more than a score of years with that corporation.

P. R. Wesley

Mr. Wesley was born in Columbia, Connecticut, September 3, 1871, and was educated in Hartford, that state, where he was graduated with the degree of B.S. from Trinity College in 1894. For three years, while in college, he served on the "Hartford Telegram," and after graduation became buyer for a department store in Providence, Rhode Island. He entered the employ of Joseph Davol, founder of the Davol Rubber Co., in a private capacity in 1898, and then served successively in the pricing and purchasing departments and as assistant to general manager C. J. Davol, now president of the company. Mr. Wesley was made manager of sales four years ago, and on October 1, this year, he became general manager.

THE RUBBER TRADE IN NEW JERSEY.

By Our Regular Correspondent.

TRENTON NOTES.

District managers representing the Empire Tire & Rubber Co. in all sections of the country recently held a three-day conference at the plant at Trenton. Twenty-two representatives attended and plans were arranged for launching the sales campaign next year. Officials announced at the session that bright prospects are held for the coming year, when all records in the automobile tire industry are expected to be shattered.

The Empire Tire & Rubber Corp., Trenton, has engaged a number of women to act as inspectors of rubber goods at the plant.

The Zee-Zee Rubber Co., Yardville, New Jersey, has inaugurated a plan to establish branches in the various cities of New Jersey. The company requests that a merchant in each town deposit between $250 and $5,000, according to size of territory, with the rubber corporation. The deposit will be held for one year at six per cent interest, the principal being returned to the owner when business connections are severed.

Nicholas Loukopulos, a former Trenton merchant, sailed on October 20 for Patras, Greece, where he will introduce the products of the Acme Rubber Manufacturing Co., and establish agencies there for the sale of tires. The Acme company believes that with automobiling increasingly popular in Greece a big demand for American tires will ensue and the Trenton concern is the first in that field.

The Thermoid Rubber Co., Trenton, has appointed John T. Spicer general sales manager, with offices at the Trenton factory. Mr. Spicer has been advertising manager of the company for some time.

The Atlas Tire & Rubber Co., Trenton, has changed its name to the Trent Rubber Co.

MISCELLANEOUS NEW JERSEY NOTES.

Dr. Frederic Dannerth, a leading authority on industrial chemistry, delivered on October 17 the first of a series of thirty lectures on corporation chemistry. This and other lectures in the same group deal with advance industrial surveys, from the point of view of the industrial chemist, of original sources of raw materials and purification plants in the primary markets, including mines, forests, plantations, etc. Subsequent lectures will give directions in the line of efficiency in executive and advisory departments, of laboratory management for business purposes, and of the economic department. The lectures will be given at the College of Technology, 367 High street, Newark, New Jersey, on Friday evenings.

The Victory Tire & Rubber Co. has changed its name to Rydon Tire & Rubber Corp. and discontinued its New York office at 5 Columbus Circle. It is temporarily located at 610 Eighth avenue, Asbury Park, New Jersey, while its new factory is being built.

The Driver-Harris Co., Harrison, New Jersey, is building a three-story reinforced concrete addition to its factory, 50 by 100 feet, to cost $50,000.

The Howe Rubber Co., of New Brunswick, New Jersey, has opened a new cafeteria on the roof of its plant for the comfort and convenience of employes. The opening was a chicken dinner for the 400 employes. The meals are being served at cost. The idea was inaugurated by W. H. Albert, comptroller of the company.

Charles Andrew Perkins, formerly office manager of the Endurance Tire & Rubber Co., New Brunswick, New Jersey, died recently at his home in New Brunswick, after a long illness, aged 32. He was a member of the New Brunswick Lodge of Elks and sang in the Christ Church choir at that place.

The Braender Tire & Rubber Co., Rutherford, New Jersey, is putting up a four-story addition to its factory, which it is expected will double its present production capacity.

THE RUBBER TRADE IN MASSACHUSETTS.

By Our Regular Correspondent.

The Old Bailey Rubber Store, for over 30 years on Boylston street, Boston, is holding a sale preparatory to removing to an even more central location in the shopping district. The new store will be at 11 and 13 Avon street, directly adjoining the Jordan, Marsh Co. annex. The business will occupy the entire four-story and basement building, which will be refitted and equipped for the purpose.

The C. J. Bailey Co., which succeeded to the business of the late Mr. Bailey, will continue to carry a full line of all kinds of rubber goods, but will add thereto a complete line of women's ready-to-wear garments, gowns, shirtwaists, etc. M. S. Lawrence, the treasurer of the company, who will have general management of all departments, was for more than 30 years associated with the late C. J. Bailey, and he will be assisted by H. E. Bailey, son of the founder of the house, and for several years an assistant to his father. While these new lines are to be added, the same attention will be given to the rubber trade, in which the house has become famous.

The embargo on transportation has no terrors for the Ajax Rubber Co., of Trenton, New Jersey, at least as far as the Boston branch of the company is concerned. Motor trucks are bringing tires to this city, the run from the factory being made in 15 or 20 hours. Big trucks holding about 700 tires are used, and on the return trips they are loaded with fabric. Thus time and expense are saved, with a certainty of satisfactory service.

C. E. Aldridge has been appointed manager of the Boston branch of The Portage Rubber Co., Akron and Barberton, Ohio, succeeding G. D. Niles, resigned.

Richards & Co., Inc., Boston, one of the oldest houses in the metal trade, established over a century ago, has recently entered the crude rubber business; making a specialty of Ceylon rubber. This new department is in charge of John Heard, who has been associated with the house for the last decade.

Thomas C. Cummings, for many years connected with the United States Rubber Co., and its subsidiary companies, has associated himself with E. M. Hamlin & Co., bankers, Boston, where he is devoting much of his time to rubber industrial investments. Mr. Cummings was first identified with the National India Rubber Co., Bristol, Rhode Island, later with the Mechanical Rubber Co., Cleveland, Ohio, and more recently until October was located with the mechanical department of the Boston office of the United States Rubber Co.

H. C. Krimmel, who has been manager of truck tire sales in New England for The B. F. Goodrich Rubber Co., Akron, Ohio, has been transferred to the Chicago branch of that concern. He is succeeded by Robert C. Freeman, who has been with the company several years, first as truck tire salesman in some counties of this state, then given exclusive Boston territory, and later made special sales representative to large consumers of truck tires.

The Boston Rubber Shoe Co. has opened a fine recreation room on the first floor of one of its big buildings at its Plant No. 2 in Melrose. The dedication exercises were held October 7, when various officials of the company were present, and addresses were delivered by Superintendent Philip C. Benjamin and by Mayor Adams of Melrose, who highly commended the efforts of the management in its social service to its employes. An interesting musical program was given under the auspices of young women

employed in the factory, and a dance followed the formal exercises. The new recreation room is large, well-lighted, has an excellent dancing floor, a new piano and will accommodate about 400 persons. A matron and teacher of dancing and of physical exercises will be present when the hall is opened for the brief recess period in the forenoon, in some departments, and during the noon hour.

The Associated Industries of Massachusetts held a two-day annual meeting in Boston October 22 and 23, which was presided over by its president, Frederic C. Hood, treasurer and general manager of the Hood Rubber Co., of Watertown. Mr. Hood made two addresses during the conference, one at the opening, and another on the second day, this latter being on the subject of "Employment Relations." The address was an able one and received the hearty approval of the entire assemblage. Mr. Hood retired from the presidency at this meeting and was succeeded by Charles A. Andrews, who is prominently connected with a leading fisheries company. William H. Gleason, formerly of the Revere Rubber Co., Chelsea, Massachusetts, was reelected treasurer.

Chester J. Pike, who for several years was New England selling agent for the United States Rubber Co., but who for the last decade has occupied a prominent position in the advertising world as New England manager of Hoyt's Service, Inc., was chairman of the entertainment committee at the convention of the American Association of Advertising Agencies, which was held in Boston the middle of October.

The Boston Woven Hose & Rubber Co., Cambridge, finds the growth of its leatherette department increasing to such an extent that it is erecting a special building on a lot adjoining its present plant on Portland street, Cambridge. The plan of the building is to have each operation of the manufacture isolated from all others and each room is separated by a twelve-inch fire wall. Four concrete storage bins are provided for the storage of chemicals.

An interesting feature is the arrangement for carrying off vapors peculiar to the manufacture of leatherette. These vapors, heavier than air, are carried away through the floor. The company is developing an extensive foreign trade for its leatherette.

The Converse Rubber Shoe Co., Malden, will soon build a five-story reinforced concrete storehouse, 75 by 52 feet, at an estimated cost of $75,000.

The United Shoe Machinery Corporation is building a three-story reinforced concrete building at its Beverly, Massachusetts, plant. It will be 400 feet long and 120 feet wide, and will be used mainly as a storage warehouse.

The Tyer Rubber Co., Andover, Massachusetts, has greatly enlarged the scope of its machine shop, where a large amount of new equipment has been installed, thus better enabling the company to handle its repairs, and also to manufacture its own mold equipment for tires and sundries. The company reports a marked increase in its export trade in druggists' sundries during the present year. A dinner gathering of the management and employes was held at the Phillips Inn, the evening of October 27, when plans for closer cooperation and mutual service were discussed.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, has organized an educational department, to which all boy employes are eligible. It is under the supervision of Miss Louise Scott. English, spelling and bookkeeping are the subjects now taught, and shorthand and typewriting may be added later. The class is held three nights a week, the sessions lasting from 5.30 to 6.45 o'clock.

The Firestone Tire & Rubber Co., Akron, Ohio, has appointed G. I. Engle, formerly manager of its branch at Springfield, Massachusetts, to be special manufacturers' representative for the New England district.

EASTERN NOTES.

The Norwalk Tire and Rubber Co., Inc., Norwalk, Connecticut, is building a five-story addition to its factory, 85 by 160 feet. The foundations are now being put in and it is expected that the building will be completed by March 1, 1920.

The Goodyear Cotton Mills, Inc., Killingly, Connecticut, recently offered its employes an opportunity to subscribe to its seven per cent cumulative stock. About 200 responded, of whom 13 took stock to the amount of about $1,000 each and 36 others $500 each, the average subscription being $270, and the total, $54,000. This stock carries a bonus of three per cent to all who subscribe and remain employes of the company.

The Mechanical Tire Co., Inc., 49 North Third avenue, Mount Vernon, New York, has increased its capital to $100,000 but no stock has as yet been issued. Aron Rubin is secretary.

The Amalgamated Tire Stores Corp. of Delaware has been organized to acquire the assets of the Newman Tire & Rubber Co., Inc., New York City, now operating eleven stores in New York and Pennsylvania and one in Baltimore, Maryland. No indebtedness will be incurred and the new corporation will open thirty to forty more stores in other cities. The officers are: Stanley Newman, president; Arthur Newman, vice-president; and William Freiday, secretary and treasurer; directors—J. Robinson-Doff, Edward R. Hewitt, George M. L. LaBranche, Jay Rathbun, Jason Rogers, and Frederick A. Travis, in addition to the officers named above. The audit and inventory were made by A. H. Wahn & Co., 120 Broadway, New York City.

The Crompton & Knowles Loom Works, Worcester, Massachusetts, has disposed of its branch plant at 17th and Glenwood avenue, Philadelphia, but has not yet vacated the premises. New property has been purchased on the northwest corner of Rosehill street and East Allegheny avenue, where such changes as may be necessary will probably be made in the building already on the site. The company is also building an addition to its Worcester foundry and increasing the foundry capacity at its works at Providence, Rhode Island.

The Keystone Tire & Rubber Co., Inc., Keystone Building, New York City, has expanded its system of chain stores for automobile tires and tubes so that the number is now 171. They are to be found in every state in the Union and in all the important cities. Each is incorporated separately as a subsidiary of the parent company. The company expects $20,000,000 worth of business a year.

A. J. Sandhoff, who has been interested in various lines of rubber production for many years, has been made assistant superintendent of the Habirshaw Electric Cable Co., Yonkers, New York. Mr. Sandhoff had been connected with rubber companies in the middle west for the past six years.

Adolph Hirsch & Co., Inc., 53 Park Row, New York City, has been incorporated by Adolph and I. Henry Hirsch, the members of the former copartnership of Adolph Hirsch & Co., to continue the business of importing rubber and other products from Brazil. The officers are: Adolph Hirsch, president; I. Henry Hirsch, vice-president and treasurer; and Arthur A. Glass, secretary.

The following tire and rubber companies incorporated within the last few years in the State of New York, have been dissolved: Durable Tire Co., Ironclad Tire Co., Overroad Tire Co., Queen Rubber Co., and the Worthmore Tire Co. The address of all at the time of incorporation was 1789 Broadway, New York City.

The L. H. Butcher Co., Inc., having outgrown its quarters, has removed from 100 William street to 239 Front street, New York City, where it has consolidated its office and warehouse in the five-story and basement building on which it has taken a long

term lease. Increased quantities of color and chemical stocks will be carried.

The Pennsylvania Rubber Co., Jeannette, Pennsylvania, has elected George W. Daum assistant general manager, while H. Wilfred DuPuy has resigned his position as treasurer in favor of A. H. Price.

The Vulcanized Rubber Co., of Morrisville, Pennsylvania, is erecting a new brick office building 80 by 120 feet, adjoining its plant.

J. F. Sieberling, son of F. A. Seiberling, president of The Goodyear Tire & Rubber Co., Akron, Ohio, has been elected president of the New Castle Rubber Co., located at New Castle, Pennsylvania.

GOODRICH ADVERTISING DIRECTOR.

THE APPOINTMENT of E. D. Gibbs as advertising director of The B. F. Goodrich Co., Akron, Ohio, is in line with the policy of that company in maintaining its publicity campaign among the leading advertisers of the country.

E. D. GIBBS.

Mr. Gibbs has a national reputation in the advertising world. For twelve years he was advertising director of the National Cash Register Co., Dayton, Ohio, during which time he built up one of the largest advertising organizations in the country and gathered about him a staff of experts in every branch of publicity. Under his direction the company acquired the second largest printing plant owned by a private corporation.

Resigning his position there, Mr. Gibbs associated himself with Robert Patterson, former vice-president of the National Cash Register Co. and conducted a business in Chicago as advertising and sales counsel. Five years later he took charge of the publicity of the Bush Terminal Co., New York City, resigning that position to become associated with The B. F. Goodrich Co.

His appointment as advertising director is in harmony with plans of H. E. Raymond, first vice-president, to be relieved of the supervision of the company's advertising and concentrates the full direction of advertising under the personal supervision of W. O. Rutherford, second vice-president. Mr. Gibbs' appointment in no way disturbs the present advertising department, which will be continued as heretofore under the direction of E. C. Tibbetts, advertising manager.

Mr. Gibbs has gained a reputation as a writer and lecturer on advertising topics and has been prominently identified with the development of advertising, having held the office of president of the Associated Advertising Clubs of the World, of the Sphinx Club of New York and the New York Sales Managers Club. He is also a charter member of the Sphinx Club of London, England.

THE RUBBER TRADE IN OHIO.

By Our Regular Correspondent.

IN THE ACCOMPANYING ILLUSTRATION, the upper picture shows the reunion dinner given in October by The B. F. Goodrich Co., Akron, to those of its employes, men and women, who had been in its service for twenty or more years. B. G. Work, president, presented gold service pins to 160 men, all but twenty-four of whom are still on active duty. The pins bear the company's "wreath and G" and four stars, each star representing five years with the concern. In two cases father and son went up together; there were cases of two and of three brothers having served the twenty years together; six of the veterans were women.

Among the officials who have served twenty years or more are: B. G. Work, president; H. E. Raymond, C. B. Raymond, H. K. Raymond, and W. A. Means, vice-presidents; and E. C. Shaw, a director. Among the speakers was Percy Leavitt,

THE GOODRICH REUNION OF LONG SERVICE EMPLOYES.

GOODRICH WORKING FORCE IN 1873.

whose portrait is shown, who has been with the company for thirty-nine years. He read a history of the company, ilustrated with slides, describing his experiences during that period. The lower group represents the entire working force of the Goodrich company in 1873, numbering less than 100 where to-day it is more than 20,000.

AKRON NOTES.

The Housing Bureau of The B. F. Goodrich Co. is offering to employes the opportunity of buying homes by the payment of $700 to $900 down and the balance in monthly instalments. The houses are now being constructed in one of Akron's residential districts and will sell for from $7,000 to $9,000.

Liberty Park is henceforth to be called "New Goodrich Field" until familiarity with the name makes "Goodrich Field" sufficient. Improvements are to be made during the coming season, and it is expected that the park will be made one of the finest industrial athletic fields in the country.

A. G. Underwood, until recently manager for The B. F. Goodrich Co., Akron, in Milwaukee, Wisconsin, has succeeded H. M. Bacon as sales manager for Diamond Tires and accessories.

J. C. Lawrence, assistant treasurer of the B. F. Goodrich Co., Akron, has been assigned to the post of director of branch operations, succeeding C. E. Cook, who is now director of mechanical sales.

T. B. Tomkinson, connected with The B. F. Goodrich Co. since its merger with the Diamond Rubber Co., has been promoted to the position of assistant to the comptroller of the company.

He began his career in the rubber industry as a cost clerk for the Diamond Rubber Co. and was brought into prominence because of his intimate knowledge of the company's business at the time of the merger, after which he was made assistant auditor, a position which he held until his recent promotion.

E. C. Shaw, for many years vice-president of The B. F. Goodrich Co., is working energetically for increased facilities for the prevention and cure of tuberculosis in Akron. He is also head of the committee which will erect one of the most extensive polyclinics in the world as a memorial to the Akron soldiers and sailors who participated in the world war. The latest move made by Mr. Shaw is the taking over by Summit County of a large sanitarium formerly operated by five counties.

Employes of the Firestone Tire & Rubber Co., Akron, were

offered until October 6 to purchase from one to five shares of seven per cent preferred stock of the company in addition to that to which they were entitled as common stockholders.

The Firestone Tire & Rubber Co., Akron, entertained 100 local tire dealers at luncheon September 24 and took them through plant No. 2 which has recently been put into operation. The luncheon was given to introduce George H. Bacon, formerly of Baltimore, Maryland, who has recently been appointed manager of the local sales branch of the company. It was announced that the output of the company has been increased from 22,000 to 36,000 tires per day for the coming year.

E. C. Vermillion, for the past year identified with the Americanization work of the Firestone Tire & Rubber Co., has been made director of Americanization work of the public schools following the resignation of E. P. Wiles, formerly of Cleveland.

The latest development in industrial sports in Akron is the formation of an industrial polo league, under the management of J. D. Thomas, formerly county treasurer. The Firestone Tire & Rubber Co., The B. F. Goodrich Co., The Goodyear Tire & Rubber Co and The Miller Rubber Co. are among the rubber factories who have joined the league. The games are to be played in a local amusement park.

The Miller Athletic Association of The Miller Rubber Co., Akron, has won the industrial tennis championship of the city.

The Akron Rubber Mold & Machine Co., Akron, has neither changed hands nor is considering such a move. To the contrary, the officers of the company, consisting of S. W. Harris, president and general manager; W. E. Wilson, vice-president and assistant general manager, and G. F. Hobach, secretary and treasurer, are all active in their respective positions and authorize the announcement that decision has been reached to purchase and install new equipment and increase the size of the plant, which will enable the company to take care of its rapidly increasing business and insure improved service on deliveries to its customers.

Arthur H. Leavitt, who returned to The B. F. Goodrich Co., Akron, in charge of pneumatic truck tire and motor products sales when he received his discharge as major in the Motor Transport Corps, has resigned to accept the position of assistant sales manager with The Akron Rubber Mold & Machine Co., Akron. He had been with the Goodrich company eight years prior to 1917, when he was the first Goodrich employe to enlist.

The Portage Rubber Co., Akron and Barberton, has elected M. S. Long president in place of W. W. Wildman, resigned. The following appointments have also been made: H. M. Kerr, formerly auditor of factory costs and accounts for The B. F. Goodrich Co., Akron, controller; E. W. McCreery, formerly assistant sales manager of the Republic Rubber Co., Youngstown, Ohio, assistant sales manager; B. M. Schreckingost, special factory representative with headquarters at the factory.

The company has ordered the preparation of plans and specifications for a three-story reinforced concrete addition to the factory, to cost approximately $200,000.

The Rubber City Clearing House Co., Akron, has increased its capitalization from $200,000 to $500,000, and is building a four-story building of modern construction, 125 by 150 feet with railroad frontage, which will cost approximately $150,000. The concern deals in blemished seconds and surplus stocks of tires and also in raincoats, rubber shoes, hot-water bottles, etc., in the nature of seconds.

The India Tire & Rubber Co., Akron and Mogadore, Ohio, has appointed William G. Lerch superintendent. He was formerly in charge of tire production for The Miller Rubber Co., Akron.

The insurance plan of The Goodyear Tire & Rubber Co., Akron, recently adopted, operates on a service basis and not on that of salary. Employes may carry as high as $3,000 insurance after 20 years with the company. Ten years entitles a man to $2,000 and 15 to $2,500. The initial policy is for $1,000. These amounts are not affected by the State Workmen's Compensation Fund.

The Goodyear Tire & Rubber Co. has been cited by the War Department for its part in the war. The flag which was given the company as an acknowledgment of its patriotism is hanging in the lobby of the factory office of the company.

Miss Gertrude V. Seiberling, daughter of F. A. Seiberling, president of The Goodyear Tire & Rubber Co., Akron, was married to John L. Handy on October 4, 1919, at Stan Hywet Hall, the Seiberling residence.

The American championship in balloon racing was won by Ralph H. Upson, pilot of the balloon "Goodyear II" of the Akron Aero Club, when he won the recent race which started October 1 from St. Louis, Missouri. Upson was the seventh out of the ten contestants to report landing and the fourth to land in Canada, coming down at 8:55 p. m. October 2 at Dunham, Quebec, in a severe thunderstorm. The duration of the trip was 26 2/3 hours and the straight line distance, 1,020 miles. Upson also won the 1913 race and R. A. D. Preston, another Goodyear man whose picture appeared in The India Rubber World for November 1, 1918, won in 1914. Both Upson and Preston are therefore qualified to enter the international balloon race in 1920.

"Every foreign-born workman speaking English and no man without his first papers by 1921," is the slogan of The Goodyear Tire & Rubber Co. in its Americanization program, aided by the factory school where aliens are taught to read, write, and speak English. There are now 61 classes weekly, and the entire course consists of 250 hours of class-room work in three grades comprising conversational English, history and government, and the ideals of Americanization. Each student is advanced to the next higher class as soon as capable.

CLEVELAND NOTES

The Thermoid Rubber Co., Trenton, New Jersey, has opened a local sales office at 1302-1303 Swetland Building, Cleveland, in charge of H. R. Portugal. Carl A. Schell, in charge of engineering, also has his headquarters at the same place.

The D. & M. Cord Tire Co., Engineers Building, Cleveland, is building a one-story brick building, 140 by 220 feet, for the exclusive manufacture of cord tires, and is planning a three-story brick, steel, and concrete building, 120 by 285 feet, to be started during the coming year. The manufacture of inner tubes will be postponed until completion of the latter building. The production of cord tires is planned to start about February 1, 1920.

The McElrath Tire & Rubber Co., Cleveland, has accepted the factory site offered by the Chamber of Commerce of Ravenna, Ohio, which consists of ten acres of land west of the Erie railroad depot, adjoining the railroad on Oakwood street. The formal acceptance written the Ravenna Chamber of Commerce, signed by R. P. McElrath as president of the company, was dropped in a box from an airplane so that it landed on the new factory site. Ground will be broken in the near future.

The Zenith Tire & Rubber Co., Leader Building, Cleveland, has purchased 236 acres of land at the east edge of the city, between Euclid avenue and the Nickel Plate and New York Central railroads. Plans are being prepared for a group of buildings consisting of a power plant, main factory, and administration building, to cost approximately $1,000,000. Construction work will start early next year.

MISCELLANEOUS OHIO NOTES

The Pennsylvania Rubber Co., East Jeannette, Pennsylvania, has opened a branch office at 120 East 8th street, Cincinnati, in

charge of J. G. Smith, recently returned from overseas where he served as a lieutenant in Germany.

The Kelly-Springfield Tire Co., New York City, has leased for ten years the six-story and basement building at 212-214 East 8th street, Cincinnati, Ohio, where the Cincinnati branch will be established.

Announcement has been made by the Rubber Products Co., at Barberton, that its output of tires will be doubled within the next sixty or ninety days. A large factory addition was recently completed and is now being equipped with machinery. This concern is comparatively new in the tire business, having first engaged in it only two years before the war. Previous to that time it specialized on rubber sundries only.

The vice-president and factory manager of The Master Tire & Rubber Co., Dayton, Ohio, George H. Witsaman, has had 18 years' active experience in the tire industry. He was with The B. F. Goodrich Co., Akron, from 1901 to 1908, being the sixth man in its employ to build automobile tires. From 1908 to 1915, Mr. Witsaman was with The Dayton Rubber Manufacturing Co., Dayton, as superintendent, and from 1917 to June 1, 1919, as factory manager. In the interim from 1915 to 1917 he was experimental and construction engineer in the experimental department of The Goodyear Tire & Rubber Co., Akron. Mr. Witsaman remained with the Dayton company until June 1 of the present year when he resigned to assist in the formation of The Master Tire & Rubber Co.

G. H. Witsaman.

A convention of managers and salesmen including the export manager of The Mason Tire & Rubber Co., Kent, Ohio, was held October 9-10, for the purpose of going over in detail the policies of the company for the coming year. Branch managers from all over the country were present.

The Steele-Alderfer Co., Cuyahoga Falls, Ohio, manufacturer of woolen crates for transporting tires, hose reels, etc., has increased its capital stock from $85,000 to $250,000, to take care of its increasing business. Ground has been broken for the erection of a number of fireproof buildings, and the present main structure will be enlarged by a two-story addition, 60 by 100 feet. The new buildings will include a two-story one, 40 by 100 feet, to accommodate a new large band sawmill; a new office building; a garage; and a dry kiln. Electrical machinery will be installed and a traveling crane to replace the present derrick system for handling logs. The officers of the company are: T. A. Steele, president; Charles McCuskey, vice-president; W. H. Schnabel, secretary; F. R. Steele, treasurer.

Charles J. Hazen has been appointed advertising manager of The Marathon Tire and Rubber Co., Cuyahoga Falls, Ohio.

The Perfect Rubber Co., Mansfield, Ohio, plans to begin the manufacture of rubber novelties, water bottles, and druggists' sundries in the near future.

The De Vilbiss Manufacturing Co., Toledo, Ohio, manufacturer of atomizers, etc., has increased its capital stock from $700,000 to $2,000,000 for the purpose of carrying on its increased business. It has also purchased the plant of the Lenk Wine Co., in West Toledo, to provide a new factory for its Aeron system. This includes seven brick buildings and four of wood, with a total floor space of 75,000 square feet. These will be remodeled and modernized.

The East Palestine Rubber Co., East Palestine, Ohio, at its adjourned annual meeting, elected an entirely new board of directors, namely: C. F. Adamson, J. F. Stoddard, J. H. Whittenberger, William G. Morris, C. F. Woods, S. B. McClure, and P. H. Murphy. The following officers were elected: C. F. Adamson, president and treasurer; S. B. McClure, vice-president; and J. F. Stoddard, secreary.

JOHN YOUNG, FIRESTONE'S CHIEF CHEMIST.

John Young, chief chemist of the Firestone Tire & Rubber Co., Akron, Ohio, was born in Perth, Scotland, in 1886 and educated at Perth Academy and the Royal Technical College at Glasgow, taking degrees with honors in organic chemistry.

John Young.

Mr. Young started as assistant chemist with Thomas de la Rue & Co., London, England, his investigations being principally on gums and mucilages, printing inks and paper, and hard rubber for fountain pens. Later he proceeded to British Guinea, being appointed assistant chemist on a rubber and sugar plantation, and during his two years' stay there, he had charge of all the scientific work in connection with the rubber production, including collection and setting out of seeds and seedlings, fertilization experiments, investigation of plant diseases, collection and coagulation of latex. In 1911 he went to Akron, Ohio, to work in the research laboratory of the Diamond Rubber Co., under Dr. Spence, and while there he published several papers, in collaboration with Dr. Spence, on the theory of vulcanization.

In January, 1916, Mr. Young was appointed assistant chief chemist of the Firestone Tire & Rubber Co., and later in the same year was promoted to the position of chief chemist, in this capacity having charge of the general and research laboratory, and all compounding work and factory control. Early in 1917 it was found necessary to enlarge the department, and a new set of laboratories was equipped to take care of the growing needs of the department which now has a staff of 45 well trained men.

Mr. Young passed examination for associateship of the Institute of Chemistry of Great Britain and Ireland in 1909 and was elected a Fellow of the Institute of Chemistry in 1914. He was elected a Fellow of the Chemical Society of London and a member of the Society of Chemical Industry in 1910. He is also a member of the American Chemical Society.

MID-WESTERN NOTES.

By Our Regular Correspondent.

The Portage Rubber Co., Akron and Barberton, Ohio, has appointed the following new branch managers in the Middle West: Chicago—J. V. Wedgewood, succeeding J. W. Wildman, resigned; Minneapolis—W. R. McCarty, succeeding L. T. Ware, resigned; Detroit—S. R. Waller, succeeding L. T. MacGregor, resigned.

The Victor Rubber Co., Springfield, Ohio, has opened a branch at 1720 South Michigan avenue, Chicago, Illinois, with F. A. Richards as branch manager and George Hoff as office manager. Mr. Richards was formerly with the McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio, and Mr. Hoff comes from the Detroit office of the Victor company.

The Pennsylvania Rubber Co., Jeannette, Pennsylvania, has appointed Daniel McAvoy in charge of its branch at Omaha, Nebraska.

The Federal Rubber Co. of Illinois, Cudahy, Wisconsin, has appointed J. W. Culver, formerly district manager of the Boston Woven Hose & Rubber Co., as manager of its mechanical rubber goods division.

The Racine Rubber Co., Racine, Wisconsin, is building a four-story brick addition with basement, 175 by 80 feet. New equipment is being installed in the company's power house, including additional boilers and a low-pressure turbine with direct-connected generator. The cost of these improvements will be approximately $500,000 and it is expected that the plant will be ready for full operation about the first of February. L. T. Vance is vice-president and general factory manager.

The Surety Tire & Rubber Co., St. Louis, Missouri, has increased its capitalization to $1,500,000.

The International India Rubber Corp., South Bend, Indiana, is building an addition to its plant which will give it 4,000 extra square feet of floor space for storage purposes. A new factory building will also be erected at an early date.

Charles E. Miller, of the Anderson Rubber Works, Anderson, Indiana, is building additions to the plant to add about 40,000 square feet of floor space, making the total available floor space about 100,000 square feet when these improvements are completed. One building is 108 by 108 feet, with basement, and all are of concrete, steel, and brick construction. It is expected that the new buildings will be roofed in by the end of November and will be operating in the spring after the installation of new machinery for the manufacture of the company's tires and rubber-working machinery.

The B. F. Goodrich Rubber Co., Akron, Ohio, has appointed Frank S. Thrope local manager succeeding J. B. Olson at its store at South Bend, Indiana.

The Indiana Cord Tire Co. has removed from South Bend, Indiana, to Mishawaka, Indiana, the adjoining town. The company manufactures the "cord-inner-tire" composed of cord fabric with a breaker strip. R. W. Thomas is president and A. A. Peterson is treasurer and general manager.

The Palmer Tire & Rubber Co., St. Joseph, Michigan, manufacturer of Palmer safety cord tubes and Palmer molded tubes, contemplates the building of an addition to its factory next year so as to enable it to manufacture a tire by a process designed by its president, John E. Palmer.

The Canton-Blackstone Co., Youngstown, Ohio, has received authorization to do business in the State of Michigan with a capital stock of $15,000. Arthur L. Irish is secretary.

W. P. Kastner, 2125 Michigan avenue, Chicago, Illinois, who makes a specialty of dealing in rims and rim parts for automobiles which have not been recently manufactured, has opened a branch at 1741 Woodward avenue, Detroit, Michigan, with N. J. Gender as manager. Standard equipment is also carried.

The Jaxon Steel Products Division of the General Motors Corp., Jackson, Michigan, manufacturer of automobile wheel rims, is enlarging its plant at an approximate cost of $250,000, to include two one-story buildings, 100 by 460 feet, respectively, which will be completed at an early date.

SOUTHERN NOTES.

Jack Miller has been appointed special Texas representative of The Portage Tire & Rubber Co., Akron and Barberton, Ohio, with headquarters in Dallas, Texas.

The Hibbs Rubber Co., 200 South Boaz street, Fort Worth, Texas, has recently purchased a 20-acre site on the outskirts of the city, on which it will build a modern three-story factory building. This company has recently installed at Houston, Texas, a complete tire rebuilding plant equipped throughout with its own special machinery. It is also shipping this machinery into other states. C. D. Hibbs, the president, is the originator of the process and patentee of the machinery used in rebuilding tires by the Hibbs method.

The Firestone Tire & Rubber Co., Akron, Ohio, has appointed R. L. Benham manager at its branch at Houston, Texas. M. T. Smith, one of Firestone's city salesmen in San Antonio, has gone to Houston with Mr. Benham.

The Black & Decker Manufacturing Co., Baltimore, Maryland, has broken ground for a new and larger building, 100 by 200 feet, to be erected west of the present factory and connected with it. It will be of steel and brick construction to conform architecturally with the eight residences the company is building on Joppa Road, and will be finished like them in stucco. It is expected that the new unit will be completed by December 1 so that operation may begin soon after the first of next year. The company has already moved its general offices from 105 South Calvert street to Towson Heights, Baltimore.

The Kelly-Springfield Tire Co., New York City, has awarded the contract for its new plant at Cumberland, Maryland. This will cost approximately $8,000,000 and will be ready for operation in May, 1920. The capacity will be 10,000 tires and 5,000 truck tires daily. The company's "Caterpillar" truck tire is meeting with great success.

The Portage Rubber Co., Akron and Barberton, Ohio, has promoted A. M. Fisher to the position of sales manager at its branch at Atlanta, Georgia, succeeding J. D. Pasho, resigned.

The Pennsylvania Rubber Co., East Jeannette, Pennsylvania, has opened a branch office at Charlotte, North Carolina, in charge of John D. Williamson, formerly North Carolina representative of the company.

THE RUBBER TRADE ON THE PACIFIC COAST.

By Our Regular Correspondent.

LOS ANGELES NOTES.

Ascot Park, the site of the new plant of the Goodyear Tire & Rubber Co. of California, at Los Angeles, is now the scene of great activity. Construction work is being rushed on a tire factory building 580 by 300 feet, of steel and brick, a warehouse 580 by 340 feet, and a cotton fabric mill 580 by 130 feet. The ultimate plans call for enlargement to four times the initial capacity.

The steel strike in the East has to some extent interfered with the construction of the California Goodyear plant, but the work is progressing as rapidly as possible under the circumstances, and the company expects to be able to use as many as 4,000 workmen by the first of March. Practically all the men who assist in building the plant will be given an opportunity to stay with the concern and to learn the tire-making business.

The Goodyear company at Akron, Ohio, has turned over to the California company its established business in the states of California, Oregon, Washington, Idaho, Montana, Utah, Nevada, Wyoming, Colorado, Arizona, New Mexico, and Hawaii. Until the completion of the Los Angeles plant, the Akron company will supply the California one at wholesale. A. F. Osterloh, secretary of the Akron company, has arrived in Los Angeles to assume the active management and succeeds Harry Chandler as vice-president of the California company. He is also vice-president and general manager of the Pacific Cotton Mills Co.

The Pennsylvania Rubber Co., Jeannette, Pennsylvania, has opened a branch office at Los Angeles. The manager in charge is Mr. Edelman, who was formerly with the company's branch at Omaha, Nebraska.

An active movement in support of the plan to make Los Angeles the cotton handling and shipping center of the Pacific coast is urged by the California Development Board. The board in its bulletin explains that the cotton production of the Southwest will reach approximately $43,000,000 this year, which is considerably more than half the value of the citrus crop. This is urged as a reason why the United States Railroad Administration should grant the city rates designed to develop this new industry of Los Angeles. It is believed that making Los Angeles a con-

centration point will have the effect of greatly stimulating production, as there are many thousands of acres in the Southwest on which cotton can be grown successfully.

The first Southern California motor-truck tour, which ended in Los Angeles recently, proved to be a highly successful event. The caravan was a concrete demonstration to cities, towns and rural communities of the economy and reliability of the motor truck. Los Angeles tire dealers, automobile and business men are now talking of making it an annual event like the farm tractor demonstration. Thousands of persons in cities, towns and along the highways gathered to see the trucks go by and to get an idea of what the motor truck will mean to them in future transportation matters. The first section of the caravan included a motorcycle and side car for the train captain, a pilot car for the tour manager, and a scout truck entered by the Automobile Club of Southern California. Then came a giant motor fire engine followed by a line of 21 trucks of nearly as many makes, all carrying capacity loads, varying from hay to drug store supplies.

A new departure for tire companies is the establishment at various points by the Miller Tire Sales Co., of Los Angeles, of tire service stations for its customers

The Planet Rubber Co., Los Angeles, has completed arrangements for the marketing of its new stock issue, the proceeds of which will be used for the enlargement of its plant.

SAN FRANCISCO NOTES.

The Pacific Rubber Co., in order to take care of its increased business, has opened a branch in San Francisco at 150 Mission street. P. H. Stortz, the company's sales manager in Los Angeles, who has an extensive business acquaintance throughout the state, has been given charge.

W. C. Fitzgerald, manager of the San Francisco branch of the Mohawk Rubber Co., has made arrangement with the National Tire & Rubber Co., of that city, to distribute its tires through Contra Costa and Alameda counties.

The Pacific Coast Rubber & Supply Co., Inc., 316 Mission street, San Francisco, is now controlled by the following officers, who hold all of its stock: Irvin Reed, president and manager; Henry D. Byrne, vice-president; Frank C. Stephens, secretary and treasurer. Mr. Reed was formerly Pacific Coast manager of the Republic Rubber Co., Youngstown, Ohio. Mr. Byrne was a member of the old firm, Squires & Byrne Rubber Co., Pacific Coast jobbers.

The Hewitt Rubber Co. of California, 1210 Claus Spreckels Building, San Francisco, is the Pacific Coast division of the Hewitt Rubber Co., Buffalo, New York, and is in charge of Charles W. Harris. This office also controls the company's business in Hawaii and the Philippines. Pacific Coast distributors have been appointed as follows: Howard & Litchfield, 700 Polk street, San Francisco; General Auto Supply Co., Broadway at Hobart street, Oakland, northern California; J. B. Wood Tire Co., 927 South Hill street, Los Angeles, southern California and Arizona; American Tire & Rubber Co., Broadway at Oak street, Portland, Oregon; Tomford Tire Co., 2115 Fourth street, Seattle, Washington.

Salesmen of the Samson Tire & Rubber Corporation, of Compton, California, in the Los Angeles district, held an enthusiastic meeting at the factory during the past month. A. Sleicher, president of the concern, gave a talk upon the technicalities of salesmanship, at the same time explaining the salient points of tire construction.

MISCELLANEOUS WESTERN NOTES.

The Kelly-Springfield Tire Co., New York City, has opened the following branches on the Pacific Coast: Bakersfield, California, J. E. Bradley; Fresno, California, W. A. Kidwell; Portland, Oregon, C. H. Mead; Seattle, Washington, H. M. Gagne.

The cotton crop of the Tucson, Arizona, section is expected to reach 800 bales this year, valued at about $200,000. An exhibit of the local long staple will be displayed at New Orleans at the World Cotton Congress, under the direction of H. Lyon, managing editor of the "Tucson Citizen." Local growers are preparing to undertake a campaign to destroy the wild cotton plants near the cultivated cotton fields of the Santa Cruz Valley with funds contributed by the State Horticultural Board and the county of Pima. No particular danger from the boll weevil which infects these plants is feared, as the variety of the weevil is not the same as that which has done damage in the southern fields, but it is considered best to take proper precautions. It is thought that this species of weevil cannot live through the summer heat of Arizona.

The International India Rubber Corp., South Bend, Indiana, has appointed C. H. Mayer manager of its western district, including the states of California, Arizona, Utah, Nevada, Idaho, Oregon and Washington. Mr. Mayer was formerly with the United States Rubber Co. at San Francisco, Seattle, and Portland, and was its branch manager in the latter city for a number of years.

NORTHWESTERN NOTES.

The Northwestern Tire Corporation, with Jack Rosenstroh as president and manager, has opened quarters at 444 Stark street, Portland, Oregon, for the distribution of the Keystone, National, Speedway and Batavia tires. The Northwestern Tire Corporation is one of 145 similar stores in the principal cities of the United States from one coast to the other. It will do both a wholesale and retail tire business.

Frazar & Co., New York City, manufacturers of chemicals for the rubber trade, have opened an office at Seattle, Washington, to facilitate Pacific Coast exports and imports.

CANADIAN NOTES.

By Our Regular Correspondent.

THE CANADIAN CONSOLIDATED RUBBER CO., Limited, Montreal, Quebec, has made the following changes in its officers and directorate: directors—Sir Charles G. Gordon succeeds R. C. Colt, Lieutenant-Colonel Herbert Molson, M. C., succeeds Ernest Hopkinson, and W. Binmore succeeds Hugo Wellein. J. G. Barrows has been made an assistant treasurer and Walter Binmore has assumed the duties of treasurer in addition to those of secretary of the company.

The Ames Holden Tire Co., Limited, a subsidiary of Ames-Holden-McCready, Limited, Montreal, Quebec, has nearly completed its new plant at Kitchener, Ontario, including a main building 400 by 90 feet, two stories in height, and a power house, machine shop, laboratory, office, and cement house.

The new plant of the Mount Royal Rubber Co., 1399 Messier street, Montreal, Quebec, is shortly to be completed and machinery is due to arrive this month. Talmon H. Rieder is president of the company.

The Montreal Waterproof and Clothing Co., Montreal, Quebec, has increased its capital from $99,000 to $198,000.

W. A. Black, vice-president and general manager of the Ogilvie Co., Montreal, Quebec, has been elected a director of Ames-Holden-McCready, Limited, of the same city.

Ames-Holden-McCready, Limited, Montreal, Quebec, has opened branches in Regina and Saskatoon, of which L. T. McGiverin will have charge.

The Columbus Rubber Co. of Montreal, Limited, Montreal, Quebec, has established a complete line of rubber footwear at its warehouse at 41 Princess street, Winnipeg, Manitoba. G. W. Barrett is manager. G. H. Connolly is manager of the company's branch warehouse at 709 Second street, west, Calgary, Alberta.

The Rubber Trade in Great Britain.

By Our Regular Correspondent.

The activities of the Rubber Growers' Association in the way of finding new outlets for the use of rubber can hardly be considered superfluous in view of the fact that despite the general European demand the stocks in England are larger than at any previous period. It has been difficult to find storage room for all the rubber arriving, and Liverpool and Manchester stores are being utilized, in addition to the London headquarters. The fact that ships have had to wait as long as four weeks at Liverpool to discharge has not troubled the rubber manufacturer, though it has proved annoying to associated interests. Fine hard Pará at 2*s.* 6*d.* per pound continues to show an increase of 7*d.* per pound when washed, over its plantation rival, and the fact remains that this premium continues much the same as was the case ten years ago despite all the efforts that have been made by plantation interests to show that there is no solid grounds for the belief in its superiority.

RATES OF EXCHANGE.

A main topic of discussion with regard to foreign business is the rates of exchange, the present position of affairs not having been generally foreseen. Although the European countries are in the worst position, the state of affairs is not favorable to American exporters. At the time of writing a conference called by the United States Chamber of Commerce is discussing in New York the proposed standardization of rates of exchange, and a leading part in the conference is being played by Marshall Stevens, M. P., chairman of the Xylos Rubber Co., Limited, Traffard Park, Manchester.

TRADE CONDITIONS.

Trade generally is brisk, nearly all departments of the rubber industry reporting themselves busy. At the same time competition is keen and more goods of inferior quality are being made than has been the case during the last few years. The prevailing labor unrest is responsible for a matter which is proving of considerable annoyance to those dealers placing large contracts. I refer to the clause now general in contract that prices may be raised before delivery. The clause is generally as follows: "Our price is based on the present rates of labor and material and is subject to our confirmation on receipt of order. Should any increase come into effect before completion of the order our contract price to be increased accordingly." The buyer in some cases may be excused for an uncomfortable feeling that the "accordingly" may prove to be somewhat excessive as he has no means of checking the calculations. Still if these terms are not complied with there is but little chance of the business maturing. The proofing trade keeps busy and difficulty has been experienced in obtaining a sufficient number of hands. Owing to the high price of other outer coats and umbrellas the waterproof is being more generally worn than used to be the case, though it is a poor substitute for a great coat. One does not naturally see much of rubber and fiber soles for boots, but I was told by a manufacturer specializing in this material that he was bombarded with orders. An article for which there is a great demand at present on the Continent, particularly in France, is card clothing for cotton mills. The mills have to be set going again and the British supplies of card clothing are not bothered with the new French import tax on rubber goods as they sell by special arrangement to a department of the French Government which is financing the mills.

WOMEN IN RUBBER MILLS.

As stated in The India Rubber World of September 1, 1919, it certainly seems to be the fact that women workers in the rubber industry—I refer especially to those taken on during the war—are less seriously affected by the peace than was thought would be the case. In recent visits to rubber factories I have noticed women still at work on the rolls, wet mixing mills, spreading machines, etc., work which was formerly done exclusively by men. It would appear that where an old hand does not claim his job the woman is allowed to go on.

LEYLAND & BIRMINGHAM RUBBER CO., LIMITED.

At the annual meeting of the Leyland & Birmingham Rubber Co., Limited, held in September, with R. T. Byrne in the chair, a dividend of 15 per cent was declared out of the disposable balance of £83,936; £10,000 was put to reserve, making it £75,000, and £46,543 was carried forward against last year's £28,933. In discussing the state of affairs at the various works at Leyland, Glasgow, Pierton and Mitcham, and at the foreign branch depots, the chairman spoke seriously on the labor position. After mentioning the considerable advances in wages and the system adopted of a bonus on output, he regretted to say that in common with many other industries in the country, they had suffered by the pernicious and suicidal policy of limitation of output which was still being pursued in many directions. He did not mind 47 hours or high wages, but he did ask for production and in a great many departments they were not getting it by a long way. It was seriously to be hoped that the operatives would realize the inevitable result of that disastrous policy before home and foreign trade was more seriously affected.

At an extraordinary general meeting a resolution was passed authorizing alteration of the articles of association so as to enable the directors to increase the capital of the company in view of the suggested capitalization of the reserves.

A NEW AMALGAMATION.

The United Rubber Producers, Limited, has been formed with a capital of £250,000, to acquire works for the production of rubber goods for the cycle, motor and allied trades. One works already acquired is the New Turco Rubber Co., Limited, of Clayton, Manchester, and another one is being negotiated for as a going concern. The Turco company is sole owners of two processes for the manufacture of rubber, which are expected to cause something of a revolution in the industry. The rebuilding of tires is to form a prominent part of the new company's business, this being a branch of the trade not hitherto taken up in England, though I understand it is well developed in America. It is stated that the rebuilt tire can be retailed at about one-third of the price of a new tire. In this connection I may remark that the government tires which were offered to reclaimers as scrap rubber had been purposely cut through. Whether this was to prevent them being rebuilt I cannot say. Rubber sponges are also to be an important article manufactured, Louis Alexander, the chairman of the new company, having been closely related with Mr. Leeson, formerly of the New Turco company, in the formation, a few years ago, of the Sorbo Rubber Sponge Products, Limited, whose works are near London.

COHEN & WILKS EXONERATED.

The name of this Manchester firm of waterproofers was adversely referred to in a recent report of the Parliamentary Committee inquiring into alleged defections in the Women's Royal Air Force. A Court of the Air Force was subsequently appointed to inquire into this and various other aspersions and the result of their findings is that Messrs. Cohen & Wilks and Mr. Cohen, a member of the firm, are completely exonerated from charges in connection with contracts for coats

and skirts, made by Miss O'Sullivan, assistant commandant and clothing controller of the force. The main charge was that the garments were cut on the bias, but the court found that only the sample coat was thus cut, the deliveries not being cut in that way after the lady had complained to Mr. Cohen. It was not found that the contract negatived this form of cutting by which only a few inches of cloth per garment would have been saved. The result of the charges generally was that no one, either inspectors, officers or contractors, was really to blame for anything which had occurred, a somewhat common result when departments hold their own courts of inquiry.

LONDON BUSES.

A rubber authority has expressed the opinion that in less than two years all London buses will be running on pneumatic tires.

PROPOSED BRITISH ROAD TAXES INCLUDE TIRES.

Suggestions for keeping British roads in repair by the taxation of vehicles, are made in the "Financial Times," as neither the Government nor the local rates provide sufficient money for the purpose. It is proposed to tax automobiles according to weight on a progressive scale, so that a car weighing a ton would pay ten guineas or about fifty dollars and a car weighing a ton and a half would pay 465 shillings or about $116. The proceeds would be devoted wholly to keeping the roads in order. It also is proposed to tax pleasure cars in proportion to the dust they raise and to impose extra taxes on tires that cut up the road. English makers might thus be driven to manufacture lighter cars which could compete with the American makes in the colonies and the foreign markets.

AN ASSOCIATION OF JAPANESE CRUDE RUBBER MERCHANTS.

The leading crude rubber merchants of Osaka and Kobe, Japan, have organized the Osaka and Kobe Crude Rubber Merchants' Association with headquarters at the offices of Y. Miyagawa & Co., the standing manager, in Kobe. The other managers are Otomune Shoten, Limited, and the Yuasa Trading Co., Limited, both of Osaka, the Masuda Trading Co., Limited, and Mitsui Bussan Kaisha, both of Kobe. The latter firm will act as accountant's supervisor. The by-laws of the association prescribe the procedure in all the transactions and disputes of members.

Other Kobe members include the Ito-Cho Shoten, Imaeda Ryutaro Shoten, Oyawa Shokai, Limited, Ogura Sutejiro Shoten, Kawanishi Zembei Shoten, Kato Shokai, Takahashi Brothe Shokai, Tsuhara Hilcojiro Shoten, Naigai Boyalci Kaisha, Limited, Nanyo Yashi Kaisha, Limited, Kuhara Shoji Kaisha, Limited, Miyazahi Tatsujiro Shoten and Sugimura Sataro Shoten.

The other Osaka members are Higashi-Indo Trading Co., Limited, Kawahara Girolsu Shoten, Furulsawa Shoji Kaisha, Limited, Mitsui Bussan Kaisha and Gomei Kaisha.

FRENCH RUBBER STATISTICS.

Crude rubber was imported into France in 1918 to the extent of 18,957 tons—a decrease of 3,644 tons as compared with the preceding year; 197 tons came from the United States and 12,910 from Great Britain. The importations of manufactured rubber declined from 7,070 tons in 1917 to 6,526 in 1918. The United States furnished 2,863 tons of manufactured rubber in 1918 as compared with 2,705 tons in 1917; while imports for these two years from Great Britain were 3,138 tons and 4,146 tons, respectively.

In the past six months of 1919, France imported 39,588,664 pounds of crude and reclaimed rubber, value $29,907,400, the official figures quoted by *"Le Caoutchouc et la Gutta Percha."* Of this 1,899,924 pounds came from French West Africa, 601,194 pounds from Senegal, 548,504 pounds from the French Congo; England contributed 15,782,070 pounds, the British East Indies 10,185,354 pounds, Brazil 4,687,861 pounds, and other countries 5,882,755 pounds.

The imports of January-June, 1918, were 21,787,655 pounds, valued $16,080,000, and in 1917, 29,159,142 pounds, valued $19,-697,000. The value of the manufactured rubber goods imported was $25,374,400 in the first six months of 1919, $11,078,800 in the same months of 1918, and $14,962,000 in 1917.

The exports of crude and reclaimed rubber, January-June, 1919, were valued $4,886,400; in 1918 they were 4,471,812 pounds and in 1917 7,678,022 pounds. Manufactured goods to the amount of $15,112,400 were exported January-June, 1919.

DR. ANDRE DUBOSC, C. E.

THE LIKENESS here shown is that of the noted French chemist, André Dubosc, editor in chief of our valued contemporary, *Le Caoutchouc et la Gutta Percha."*

DR. ANDRÉ DUBOSC.

M. Dubosc's name stands high in the investigation and chemistry or rubber, and his books are standard in the literature of the rubber industry. His work, in collaboration with Dr. A. Luttinger, "Le Caoutchouc; Sa Chimie Nouvelle; Ses Syntheses," published in Paris in 1914, and in English later in this country, shows deep research and is a valuable contribution on the subject. Equally valuable is his "Les Cholsterols, au Point de Vue Scientifique et Industriel."

M. Dubosc is a tireless investigator, and a prolific writer, particularly on rubber chemistry. Among his studies and conclusions may be mentioned the recommendation of the use of formic acid, in place of sulphuric acid in reclaiming; the discovery of a new process for separating pure rubber from combined sulphur in reclaimings; a method of determining the amount of uncombined rubber in reclaimed vulcanized rubber; an investigation of the treating of crude jelutong with acetone and ether; a study of the various methods of analysis of the sulphides of antimony; of the influence of hypophosphites on colored crêpe rubber; a review of catalysis and its application to vulcanization; essays on rubber substitutes, etc. Many of these were prepared for and published in THE INDIA RUBBER WORLD. His briefs of the work of contemporary scientists, as published in his own journal, show a complete grasp of the subjects, much research and keen observation.

M. Dubosc visited the United States in 1915-1916, and one result of his inspection and investigation here was the instituting in Paris of a course in chemistry applied to rubber, similar to those in this country, in England and in Germany, the classes being held in his laboratory in Paris.

FRENCH TESTS OF PNEUMATIC AND SOLID TIRES.

AN IMPORTANT PARIS TRANSPORTATION COMPANY HAS 100 TRUCKS of 2½ tons capacity running on dual pneumatics and is convinced that, for a 2½-ton load the pneumatic tire is superior to the solid because of its lower cost of maintenance and the greater tonnage transported by reason of the higher average speed. The experience of this firm is that with six-inch dual tires on the rear and the same size single on the front, the average tire life is 7,500 miles on the front wheels and 5,000 miles on the rear. There is reason to believe that if these trucks had been

designed originally for use with pneumatic tires the mileage would have been higher.

Tests to ascertain the comparative advantages of solid and pneumatic tires for trucks were made by the Michelin company in France, using a pair of 2½-ton trucks worked side by side, one of these trucks being on solid tires and the other on six-inch dual pneumatics. These tests lasted five months during which time the solid-tired truck ran 6,523 miles and the pneumatic-tired truck, 9,631 miles. The tests were brought to a close when the solid-tired truck became unfit for further service, a rear wheel being broken and the steering pivots very badly worn. The increased mileage, by reason of the higher average speed of the pneumatic-tired truck and the absence of visits to the repair shop amounted to about 50 per cent.

The following advantages in favor of pneumatics were noted as the outcome of these tests:

1. Lower cost of repairs and maintenance.
2. Increased tonnage transported by reason of the higher average speed.
3. Lower physical effort for the driver.
4. Better performance on snow or on heavy clay roads.
5. Truck less dependent on road surface.

Tire makers are not all certain that the pneumatic tire competes with the solid for heavy haulage, certain ones holding to the opinion that each type of tire has its distinct field. In France the opinion is growng that modern large-size pneumatics can compete with solids and such tire equipment is being offered for useful loads of 2 to 3½ tons.

It is maintained that the 10 and 12-inch tire does not give any better riding qualities than a couple of six-inch, while it has the disadvantages of very high cost, great weight, and difficulty of fitting.

In France only the soft-bead tire is known and some of the difficulties of mounting would disappear with the use of the straight-side tire. In France, too, the value of the detachable steel disk wheel has been thoroughly established by the severe tests of war service. ("Automotive Industries.")

THE RECONSTRUCTION OF GERMANY'S RUBBER INDUSTRY.

HAMBURG AS A RUBBER MARKET.

Hamburg as a world market for middle grade rubber is a thing of the past. The fact must be faced that only comparatively small quantities of "wild" rubber, with the exception of the Pará qualities, will be collected and shipped to Europe. The experience of Liverpool, which was an important market for this kind of rubber, has been, during the war, that the drop in the price of rubber to about 50 cents a pound for the best plantation grades has killed what interest the producers had in collecting wild rubber so that they have turned their attention to other raw materials.

This will naturally affect Hamburg also, which will find besides in Amsterdam a new rival for the world rubber trade in addition to her former competitors, Antwerp and London, which have the advantage not only of dealing with their own colonies but of controlling abundant free capital in the hands of enterprising tradesmen. The output of the Dutch East Indies plantations, which are owned almost exclusively in Holland, amounting to over 50,000 tons a year, will be shipped for the most part to Amsterdam or will at any rate be marketed there.

It will take all the enterprise, the combined effort and perfect organization of Hamburg business men to contend against the influence of the foreign markets and secure for Hamburg independence in trading and in the direct importation of plantation rubber to supply the needs of the German rubber industry.

GERMAN TRADE NOTES.

German Government control of industries keeps on. Small dealers in waste and reclaimed rubber are ordered, by a decree issued May 13, 1919, to turn over whatever stock they gather to twenty-two specified firms in Frankfurt am Main, Hanover, Berlin, Hamburg, Dresden, Leipzig, Köln, Minden, Breslau and Lübeck.

The German Government has sanctioned importation of foreign motor tires, under license; unlicensed importations will be confiscated. The "*Gummi-Zeitung*" criticises the measure sharply; it sees no reason for hurrying automobile business before German manufacturers are able to procure rubber and to have their chance to compete. The Continental Caoutchouc & Guttapercha Co. has published a protest against the sanction.

A "Protective Association of Inventors" has been formed in Berlin, which asks a government subvention to further its objects, which are to see that German inventors are protected in their patent rights, which have suffered much from irregularities of all kinds during the war, and also to further the use of German inventions wherever they are likely to serve German interests and the reconstruction of German industries.

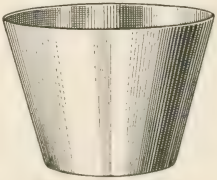
HOLLAND'S RUBBER MANUFACTURING INDUSTRY GROWS.

When the war broke out in 1914 the principal manufacturers of rubber goods in Holland were, Hevea at Hoogezand, Pompe at Amsterdam, Hollandsche Draad & Kahelfabriek, also at Amsterdam, Gebr. Merens at Haarlem, St. Joris, better known as Bakker, at Ridderkerk and Vredestein at Loosduinen. Many of these extended their operations during the war and the first two amalgamated with some other firms in the N. V. Vereenigde Nederlandsche Rubber Fabrieken, which has erected very large works at Doorwerth near Oosterbeck. Many new firms have gone into the manufacture of rubber articles, so that in the first months of 1919 there were 29 factories, large and small, in Holland where crude rubber was turned into finished articles.

The closing of the ports created a great demand for tires of all descriptions; rubber insulated wire, which had before been mostly imported, was made by the Hollandsche Draht & Kabelfabriek; the making of ebonite wares for the electro-technical industries was developed. The war introduced into Holland the cold vulcanizing process and the manufacture of surgical gloves and fingers, supplies, tobacco pouches, balloons, dentists' supplies, valve tubing, waterproof sheeting, erasers and so on. The little pilot balloons used by the Royal Meteorological Institute, which used to be imported, are now home made and a beginning attempted in the manufacture of tennis balls.

ALUMINUM LATEX CUPS.

That latex cups made of aluminum are in use on rubber plantations is well known and not particularly interesting. But the fact that they are made in the United States and by the hundred thousands is another matter and worthy of more than passing notice.



Nesting Tapping Cups.

The cup shown here is an American product made from a straight sheet of pure aluminum, No. 25 B. & S. gage, and goes through six operations before the cup assumes its final shape. The cups are finally cleaned in an acid bath and dried in hot sawdust. The fact that they nest is a convenience, not only in shipping but on the plantation as well. (American Metal Works, 4865 Stenton avenue, Philadelphia, Pennsylvania.)

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED SEPTEMBER 2, 1919.

No. 1,314,650. Tire valve. E. E .Holt, assignor to Holt Auto Devices Co.—both of Chicago, Ill.

1,314,670. Hard rubber pipe reinforced with metal embedded in it and encased in soft rubber. W. H. Juve and H. A. Hoffman, Akron, O., assignors to The B. F. Goodrich Co., New York City.

1,314,764. Resilient tire. G. Stever, Akron, O.

1,314,799. Garment protector. G. K. Guinzburg, assignor to I. B. Kleinert Rubber Co.—Both of New York City.

1,314,819. Telephone set for dictograph. C. H. Lehman, assignor by mesne assignments to Dictograph Products Corp.—both of New York City.

1,314,930. Casing for pneumatic tire. E. K. Baker, assignor by mesne assignment to himself and C. G. Hawley—both of Chicago, Ill.

1,314,932. Demountable rim for tires. E. K. Baker, assignor to Universal Rim Co.—both of Chicago, Ill.

1,314,933. Demountable rim for tires. E. K. Baker, assignor to Universal Rim Co.—both of Chicago, Ill.

1,314,934. Demountable rim for tires. E. K. Baker, assignor to Universal Rim Co.—both of Chicago, Ill.

1,314,935. Demountable rim for tires. E. K. Baker, assignor to Universal Rim Co.—both of Chicago, Ill.

1,314,936. Demountable rim for tires. E. K. Baker, assignor to Universal Rim Co.—both of Chicago, Ill.

1,314,937. Demountable rim for tires. E. K. Baker, assignor to Universal Rim Co.—both of Chicago, Ill.

1,314,938. Transplit demountable rim for tires. E. K. Baker, assignor to Universal Rim Co.—both of Chicago, Ill.

1,314,997. Resilient shoe with rubber heel. G. J. Winter and C. S. Diebolt—both of Buffalo, N. Y.

1,315,001. Resilient tire. W. Ashcroft, Garson Quarry, Manitoba, Can.

1,315,043. Resilient automobile wheel. W. Seidel, Chicago, Ill.

1,315,062. Cushion tire. W. E. Walker, Cottage Grove, Ore. (Renewed January 23, 1919.)

1,315,091. Resilient automobile wheel. W. G. Chipley, Omaha, Neb.

1,315,092. Tread and felloe construction for wheels. W. G. Chipley, Omaha, Neb.

1,315,136. Pneumatic tire. P. S. Lietz, Chicago, Ill.

1,315,164. Syringe. O. O. R. Schwidetzky, Hasbrouck Heights, assignor to Becton Dickinson & Co., Rutherford—both in N. J.

1,315,173. Automatic pressure relief valve for pneumatic tires. L. M. Wampler, Liberal, Kans.

1,315,178. Combination of pneumatic tire and inwardly channeled wheel rim, etc. G. G. Buckland, San Francisco, Calif.

1,315,184 Fastening means for demountable rims. J. C. Fuller, Sewaren, N. J.

ISSUED SEPTEMBER 9, 1919.

1,315,199. Demountable rim for tires. A. J. Anderson, Binford, N. D.

1,315,267. Aquatic device. M. C. White, Los Angeles, Calif.

1,315,286. Divisible wheel for automobiles. W. Brown, Peterborough, Eng.

1,315,292. Pneumatic-tire tread. T. Dunn, London, Eng.

1,315,471. Tire. H. Dalwigk, San Antonio, Tex.

1,315,482. Non-slip tread for shoes, with solid rubber margin and interior of sponge rubber.

1,315,515. Gas mask. C. W. Kohler and F. H. Martin, Akron, O., assignors to The B. F. Goodrich Co., New York City.

1,315,573. Hose supporter. C. C. Peterson, Washington, D. C.

1,315,598. Armored pneumatic tire. F. Fisher, Ironton, Mo.

1,315,626. Resilient tire. W. Gerwien, San Francisco, Calif.

1,315,683. Rubber heel, J. H. Overton, Trenton, N. J.

1,315,778. Dust cap for tire valve. H. P. Kraft, Ridgewood, N. J.

1,315,837. Resilient tire. C. E. Hopkins, Washington, D. C.

ISSUED SEPTEMBER 13, 1919.

1,315,955. Valve for inflating toy balloons, etc. H. R. Gill, Ashland, O.

1,315,995. Tire valve. L. H. Shoup and E. H. Webb, Montrose, Colo.

1,316,072. Milking machine with rubber teat cups. C. O. Anderson, Springfield, Ill.

1,316,186. Resilient tire. G. J. Rheuban, assignor of ½ to I. J. Tatro—both of Youngstown, O.

1,316,340. Suction apparatus for surgical use. A. H. Tuttle, Cambridge, Mass.

1,316,364. Raincoat. F. W. Howard, New York City.

1,316,423. Pneumatic arch support. R. S. Carling, Los Angeles, Calif.

1,316,469. Combined pneumatic mattress and garment. R. Werner, San Francisco, Calif.

1,316,501. Elastic non-inflatable rubber tire. C. A. Morrison, Delaware, O.

ISSUED SEPTEMBER 23, 1919.

1,316,562. Rubber-soled shoe and method of manufacture. J. A. Dunphy, Groton, Mass., assignor by mesne assignments to United Shoe Machinery Corp., Paterson, N. J.

1,316,594. Tire casing. S. C. Rand, Chicago, Ill.

1,316,605. Tire rim. J. H. Wagenhorst, Akron, O.

1,316,686. Pneumatic tire. J. C. Chapman, New York City.

1,316,766. Pneumatic tire with clincher rim, etc. J. T. Clark, Provo, Utah.

1,316,773. Tire and method of forming. Delille Daigre, Levallois-Perret, France.

1,316,978. Reinforced pneumatic tire. J. F. Robinson, Minneapolis, Minn.

1,317,010. Combined solid and pneumatic tire. A. F. Fairchild, Delavan, Wis.

1,317,102. Hot-water bag. M. L. Reid, San Francisco, Calif.

1,317,140. Collapsible box for shipping purposes. E. Lenke, Cuyahoga Falls, assignor to F. T. Lahey, Akron—both in Ohio.

ISSUED SEPTEMBER 30, 1919.

1,317,161. Shoe with combined innersole, arch support, ventilator, etc. J. T. Hay, Lackawanna, N. Y.

1,317,185. Tread for pneumatic tires. R. W. Twombly, Freeport, Tex.

1,317,223. Cigarette and cigar case with elastic band for retaining contents in place. F. S. Russell, Glasgow, Scotland.

1,317,235. Pneumatic mattress. C. H. Stonebridge, New York City.

1,317,305. Inflatable knee-pad. U. C. Miller, Waurika, Okla.

1,317,326. Hose clamp. H. B. Sherman, Battle Creek, Mich.

1,317,472. Fountain pen. F. M. Ashley, Brooklyn, N. Y., assignor by mesme assignments to the Wahl Co., Wilmington, Del.

1,317,478. Split rim for tires. W. N. Booth, assignor to Kelsey Wheel Co., Inc.—both of Detroit, Mich.

1,317,571. Smoker's pouch. F. Goertz, Newark, N. J., assignor to The Scoban Co., Inc., New York City.

1,317,585. Solid rubber tire. C. Macbeth and H. C. Young, Birmingham, assignors to The Dunlop Rubber Co., Limited, Westminster, London—both in England.

1,317,615. Tire abrader. F. N. Cordell, St. Louis, Mo.

THE DOMINION OF CANADA.

ISSUED SEPTEMBER 9, 1919.

192,509. Garter. T. D. Anagnostopoulos, Eunice, La., U. S. A.

192,553. Fountain pen. J. Hillinger, Chicago, Ill., U. S. A.

192,595. Tire tread. J. W. Taylor, Kellogg, Ida., U. S. A.

192,624. Pneumatic valve. The Double Seal Tire Valve Co., Detroit, Mich, assignee of W. P. Porter, Bronx, N. Y.—both in the U. S. A.

ISSUED SEPTEMBER 16, 1919.

192,673. Garment supporter. W. D. Corder, Phillippi, W. Va., U. S. A.

192,701. Pneumatic tire. E. J. Kreis, Mendota, Ill., U. S. A.

192,708. Shoulder braces. A. Malcolmson, Moorefield, Ont.

192,734. Hot-water bag. M. L. Reid, San Francisco, Calif., U. S. A.

192,737. Tire valve. M. C. Schweinert, West Hoboken, N. J., U. S. A.

192,798. Valve for tires. T. A. Lowe, Renfrew, assignee of W. Goodwin, Peterborough—both in Ontario.

ISSUED SEPTEMBER 23, 1919.

192,812. Rim for pneumatic tires. P. G. Beremand, Bay City, Mich., U. S. A.

192,821. Demountable rim for tires. G. W. Clements, Detroit, Mich., U. S. A.

192,829. Auxiliary rim for tires in combination with wheel and main rim. C. G. Evans, Sault Ste. Marie, Ont.

192,832. Respirator. L. Farr, El Portal, Calif., U. S. A.

192,865. Bottle closure. J. G. Newman, North Sydney, N. S. W., Australia.

192,874. Waterproof garment with ventilated seam. C. B. Shane, Chicago, Ill., U. S. A.

192,878. Reinforcing boot for tires. E. M. Steell, Spokane, Wash., U. S. A.

192,898. Collapsible rim for tires. The Baer Collapsible Rim Corp., assignee of C. H. Baer—both of San Francisco, Calif., U. S. A.

192,903. Patch for balloons. The Goodyear Tire & Rubber Co., assignee of H. T. Kraft—both of Akron, O., U. S. A.

192,914. Transversely split demountable rim. The Universal Rim Co., assignee of E. K. Baker—both of Chicago, Ill.

ISSUED SEPTEMBER 30, 1919.

192,936. Tire abrader. F. N. Cordell, St. Louis, Mo., U. S. A.

192,999. Ear drum. W. L. Stewart, Trenton, N. J., U. S. A.

193,000. Resilient tire. E. J. Taylor, Edmonton, Alta.

193,016. Tire patch. The Durkee-Atwood Co., assignee of H. C. Atwood—both of Minneapolis, Minn., U. S. A.

THE UNITED KINGDOM.

ISSUED SEPTEMBER 3, 1919.

129,029. Shock-absorbing device for airplanes, with rubber springs. Siddeley-Deasy Motor Car Co. and F. M. Green, Parkside, Coventry.

129,048. Rubber face-pad for field glasses, etc. E. T. P. Goodyear, Colley Corner, Reigate Heath, Surrey.

129,115. Fountain pen. E. C. R. Marks, 57 Lincoln's Inn Fields, London. (Conklin Pen Manufacturing Co., Toledo, O., U. S. A.)

129,141. Hollow rubber ring for expanding piston packing-ring in double-acting pump for liquids, air, etc. H. Hewins, The Elms, Grimsby, Lincolnshire.

129,159. Surgical douche apparatus. T. H. McNamara, 1146 Mission street, San Francisco, Calif., U. S. A.

129,195. Tire patch. W. C. Wood, 74 Western avenue, Minneapolis, Minn., U. S. A.

129,233. Latex spout. Sir J. Anderson, 5 Whittington avenue, Leadenhall street, London.

ISSUED SEPTEMBER 10, 1919.

129,416. Parachute, case, and damp-proof lining. F. C. Mears, West Africa House, Kingsway, London.

129,428. Rectal support. J. McIntyre, 128 Beach street, Jersey City, N. J., U. S. A.

129,592. Arch support with rubber pad. Orthopedists, Limited, King's Cross Road,. London.

129,597. Valve for tires. C. J. Faurbye, Skjern, and S. Alstrup, Aarhus —both in Denmark.

ISSUED SEPTEMBER 17, 1919.

129,744. Tire valve. J. N. Newsom, 2714 La Salle street, St. Louis, Mo., U. S. A.

129,756. Rubber heel lift recessed for inserting metal plate. I. Henne, 957 Kent avenue, Brooklyn, N. Y., U. S. A.

129,783. Self-sealing pneumatic tire, etc. C. A. Cleghorn, Brackenside, Woburn Sands, Bedfordshire.

129,852. Resilient tire with core of cork sections, etc. A. E. Williams, 30 East Parade, Rhyl, Denbighshire.

129,914. Metal plate to protect rubber heels when being applied. F. A. Nolan, 216 New York Life Building, St. Paul, Minn., U. S. A.

Chemical Patents will be found on pages 86, 87. Machinery Patents on pages 92.

129,917. Foot arch support. T. Cottey, 901 South Mabel street, Tulsa, Okla.
129,965. Life-saving garment. D. Del Re, Iron River, Mich., U. S. A. (Not yet accepted.)

ISSUED SEPTEMBER 24, 1919.

130,147. Artificial feet with rubber cushions to restrain ankle movement. W. H. Tresidder, trading as W. R. Grossmith, 12 Burleigh street, Strand, London.
130,280. Boot sole with top and bottom layers of wood and one or more intermediate layers of rubber, canvas, etc. V. Buckland, 68 Windmill Road, West Croydon, Surrey.
130,282. Rubber band stamp with means for adjusting tension and dismantling. F. Pitman, Bulla-Harre, Campbell street, East Kew, Victoria, Australia.
130,306. [illegible] J. D. Pollard, 2755 West Jackson Boulevard, Chicago, Ill., U. S. A.
130,331. Demountable rim for tires. B. Tamburello, New York City, U. S. A. (Not yet accepted.)
don, near Southampton. (Not yet accepted.)

THE FRENCH REPUBLIC.

PATENTS ISSUED, WITH DATES OF APPLICATION.

491,067. (July 29, 1918.) Holder for cup and dripping spout in tapping. [illegible] Rubber Co.
491,113. (February 3, 1915.) Elastic insulated fender as lining for bullet-proof [illegible]. A. Delille-Daigre, G. de St. Marc, and S. de Szeptycki.
491,373. (July 6, 1918.) Pneumatic valve. Holt Auto Devices Co.
492,168. (October 5, 1918.) Improvements in leggings. Mme. E. Charlet, née B. F. Bergougnan.
492,311. (May 17, 1918.) Respiratory apparatus for use in rarified atmospheres. A. F. S. Kent.
492,330. (October 16, 1918.) Hose coupling. J. B. Gagné.
492,350. (September 28, 1918.) Resilient tire for vehicle wheels. J. A. Allure.
492,394. (October 18, 1918.) Improvements in rubber heels. B. W. Brockett.
492,418. (September 28, 1916.) Apparatus for walking on the water. E. Y. Gong, U. S. A.
492,421. (October 6, 1916.) Floating apparatus for walking on the water. P. Géné.
492,438. (October 22, 1918.) Life-saving suit. J. E. Lepage.
492,603. (October 28, 1918.) Sectional casing for pneumatic tires. Société Anonyme Berendenck's Syndicast voor Banden en Deelen.
492,605. (October 30, 1918.) Non-skidding tire casing. E. Héritier, 96 rue d'Annonay, Saint-Etienne (Loire).
492,614. (October 1, 1915.) Gas Mask. G. R. Delattre.
492,643. (October 30, 1918.) Improvements in hollow bodies made of rubberized cord fabric, and their process of manufacture. T. Sloper.
492,771. (December 24, 1915.) Gas mask permitting prolonged stay in unbreathable atmospheres. J. Tissot.
492,863. (August 27, 1918.) Tire improvements. Morand Bros. and Martin Cushion Wheel Co., Chicago, Ill., U. S. A.
492,844. Life-saving vest. Mme. Beaumont, née O. Newman.
20,859/483,349. (May 16, 1918.) First certificate of addition to patent dated November 4, 1916, for improvements in stylographic and other fountain pens. D. Cameron.

TRADE MARKS.

THE UNITED STATES.

NO. 112,581. The word LIBERTY above representation of statue of Liberty on horizontal rectangle beside vertical rectangle—rubber tire patch. Liberty Patch Co., Oklahoma, Okla.
113,078. The word AUTOGRAPH—fountain pens. Charles R. Keeran, Chicago, Ill.
114,256. The initials R & L enclosed in a rectangle—rubber overshoes. Rosman & Laveson, Philadelphia, Pa.
115,189. The word SAFEPACK—sheets of paper or paper and textile combined, plain or treated by coating or impregnation to be waterproof, for use in wrapping tires, etc. Safepack Mills, Boston, Mass.
115,744. Conventional combination of the words VICTORY TIRES so arranged that the letter T serves in both words while the ends of its cross-piece are formed into the letters V and Y—pneumatic tires and inner tubes. Victory Tire & Rubber Co., New York City.
116,048. The word TIRELESS—pneumatic and solid tires. Demas Armor-Cased Tire Saving Co., Inc., Pittsburgh, Pa.
116,200. The word LILY—dress shields. Brooklyn Shield & Rubber Co., Brooklyn, N. Y.
116,353. The word SAWACO—fountain pens, erasers, etc. Samuel Ward Manufacturing Co., Boston, Mass.
117,499. The letters O and F connected by representation of a scroll bearing the word OILSKIN—rubber and balata belting, etc. Olmsted-Flint Co., Cambridge, Mass.
117,634. The word ARMORCORD—inner tubes. Armorcord Rubber Co., Morgantown, W. Va., and Washington, D. C.
117,733. The word MAYFLOWER—rubber heels and soles. Mayflower Rubber Works Co., Braintree, Mass.
117,916. The words WA-CO-FAB—waterproof dressing for textile fabrics, etc. Baker-Overton Co., Dallas, Tex.
118,040. The word EXCELSIOR—belting, hose and packing. Boston Belting Corp., Boston, Mass.
118,413. The word VULCALUN—treads and panels for stairways, floors, etc., composed of broken masses of hard mineral matter embedded in and on matrices of vulcanized rubber. American Abrasive Metals Co., New York City.
118,554. Representation of a cross within a triple circle and the word HANES arranged within the cross vertically and horizontally so that the letter N serves in both words—tires and inner tubes. Hanes Rubber Co., Winston-Salem, N. C.
118,730. The words UNION HEART separated by representation of two hearts, one superimposed on the other—tires and inner tubes. Marius Greenspan, Chicago, Ill.
118,762. The word "MIDCO" quoted—tires and tubes. The Mid-Continent Tire Manufacturing Co., Wichita, Kans.
118,879. The word FLEXO—laminated rubber and leather belts for motor vehicles. Detroit Leather Works, Detroit, Mich.
118,898. The word USCO—rubber pump-valves. United States Rubber Co., New Brunswick, N. J., and New York City.
119,818. Representation of the shaft and dart of an arrow separated by the word [illegible] [illegible] blankets. [illegible]
[illegible] The word OMO [illegible] fabric. The Omo Manufacturing Co., Middletown, Conn.
[illegible] The word OMO having a pair of wings spreading upward from the top points of the letter M—hospital sheeting made of waterproof treated fabric. The Omo Manufacturing Co., Middletown, Conn.
120,242. The words WHOLE-SOLE—fabric coverings for rubber tires. George W. Eno Rubber Co., Los Angeles, Calif.
120,492. The initials O. K. D.—golf balls. Harry C. Lee & Co., New York City.

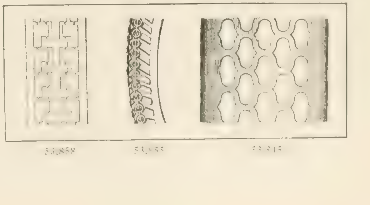
THE DOMINION OF CANADA.

24,866. The word VETERAN—rubber tires, footwear, hose, belting, and water bags. John M. Percy, Toronto, Ont.
24,879. Representation of label bearing words DICK'S PACKING and representation of two hands holding a twisted rope—packing and hose of all kinds. W. F. and J. A. Dick trading as Dick's Asbestos Co., 47 Fenchurch street, London, Eng.
24,882. The words CANADIAN BEAUTY and representation of a [illegible] rubber packing rings, jar rings, hose, and tires. Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ont.
24,884. Representation of two crossed snowshoes and a sunken shield—rubber boots, shoes, overshoes, and other footwear composed wholly or partly of rubber or rubber compositions. Canadian Consolidated Rubber Co., Limited, Montreal, Que.
24,290. The words FAULTLESS CHIPS—chewing gum. The Faultless Chemical Co., Baltimore, Md., U. S. A.
24,897. The word "IRIS" and a representation of the flower iris—elastic webs, sandaling, and cords, and rubber threads, cloths, and dress shields. Faire Bros. & Co., Limited, 2 Southampton street and St. George's Mills, Leicester, Eng.
24,898. The word "LILY" and a representation of a lily—elastic webs and cords. Faire Bros. & Co., Limited, 2 Southampton street and St. George's Mills, Leicester, Eng.
24,899. The words "THE ROSE" and the representation of a rose—elastic webs and cords. Faire Bros. & Co., Limited, 2 Southampton street and St. George's Mills, Leicester, Eng.
24,900. The word "VIOLET" and the representation of a violet—elastic webs, sandaling, and cords, rubber threads, cloths, and dress shields. Faire Bros. & Co., Limited, 2 Southampton street and St. George's Mills, Leicester, Eng.
24,901. The word "PANSY" and the representation of a pansy—elastic webs, sandalings and cords, rubber threads, cloths, and dress shields. Faire Bros. & Co., Limited, 2 Southampton street and St. George's Mills, Leicester, Eng.
24,902. The word "SNOWDROP" and the representation of a snowdrop—elastic webs, sandalings, and cords, rubber threads, cloths, and dress shields. Faire Bros. & Co., Limited, 2 Southampton street and St. George's Mills, Leicester, Eng.
24,939. The words "MOUNTAIN GOAT TIRES WITH GOAT HOOF TREADS"—automobile tires. Frank W. Bull, Oshawa, Ont.
24,986. The word "TRIANGLE" within an equilateral triangle—rubber boots, shoes, oversoes, and other footwear composed wholly or rubber or rubber compositions. Canadian Consolidated Rubber Co., Limited, Montreal, Que.
25,081. The words "THREAD RUBBER" between two concentric circles and the letter W inside the inner circle—storage batteries and parts. Willard Storage Battery Co., Cleveland, O., U. S. A.
25,087. The word "IBEX"—tires. Frank Wesley Bull, Oshawa, Ont.
25,102. The word "SLICES"—chewing gum, etc. Charles W. Pike, San Francisco, Calif, U. S. A.
25,122. The word "MADERITE"—tennis balls, water bottles, fountain and combination syringes, face and ice bags. United Drug Co., Limited, Toronto, Ont.
25,127. The word "SYMBOL"—druggists' sundries. United Drug Co., Limited, Toronto, Ont.
25,128. The word "REPUTATION"—druggists' sundries. United Drug Co., Limited, Toronto, Ont.
25,168. The word "REDDCOM"—rubber-lined cotton hose, etc. F. Reddaway & Co., Limited, Victoria Mills, Cheltenham street, Pendleton, Manchester, Lancaster County, Eng.

DESIGNS.

THE UNITED STATES.

NO. 53,845. Tire. Patented September 16, 1919. Term 14 years. Walter R. Denman, Cleveland, O.
53,855. Tire. Patented September 16, 1919. Term 7 years. E. L. McKimm, assignor to Premier Tire & Rubber Co.—both of Kansas City, Mo.
53,858. Tire or tire casing. Patented September 16, 1919. Term 14 years. Arthur E. Pearce, Ashtabula, O.



53,858 53,855 53,845

Review of the Crude Rubber Market.

NEW YORK.

Throughout October the rubber market has been very firm, with a steady and improving demand from the factories that has raised the price of plantation rubbers both here and abroad. The fluctuations in prices have been within narrow limits. At the close of the month prices were being strongly maintained. The Brazil market has been practically dead, the increase of production keeps the price down; it has become so unimportant that dealers take little interest in it. The market for guayule and balata has also been quiet. Prices for plantation and for South American rubber at the beginning and toward the close of the month are shown in the following quotations:

Plantation *Hevea*. September 27, first latex crêpe, spot 50-51½ cents, October-December 50¾ cents, January-March 51 cents, January-June 51-51½ cents, July-December, 1920, 52 cents, October 24, spot 53 cents, futures 53 cents, July-December, 1920, 53½ cents.

September 27, ribbed smoked sheet 49½ cents, October-December 49¾ cents, January-March 50 cents, January-June 50 cents, July-December, 1920, 51 cents, October 24, spot 52 cents, futures 52 cents, July-December, 1920, 52½ cents.

September 27, No. 1 amber crêpe, spot 47 cents, October 24, spot 49-50 cents.

September 27, clear thin brown crêpe, spot 46 cents, October 24, spot 44-46 cents.

September 27, No. 1 roll brown crêpe, spot 36½ cents, October 24, spot 40-41 cents.

South American Para and Caucho. Spot prices: September 27, upriver fine 54 cents, islands fine 47 cents, upriver coarse 33¾ cents, islands coarse 21½ cents, Cametá coarse 22 cents, caucho ball 33¾ cents. October 24, spot prices practically unchanged.

NEW YORK QUOTATIONS.

Following are the New York spot quotations, for one year ago, one month ago and on October 25, the current date:

	November 1, 1918, Free Rubber.	October 1, 1919.	October 25, 1919.
PLANTATION HEVEA—			
First latex crêpe	59 @	49½ @	53 @
Amber crêpe No. 1	56 @	46½ @	49 @
Amber crêpe No. 2	55 @	45½ @	48 @
Amber crêpe No. 3	54 @	44½ @	47 @
Amber crêpe No. 4	53 @	43½ @	46 @
Brown crêpe, thick and thin clean	53 @ 55	44½ @	44 @
Brown crêpe, thin specky	44 @	42½ @	41½ @
Brown crêpe, rolled	36 @	37 @	40½ @
Smoked sheet, ribbed, standard quality	57 @	48½ @	52 @
Smoked sheets, plain, standard quality	54 @	45 @	49 @
Unsmoked sheet, standard quality	50 @	42 @	47 @
Colombo scrap No. 1	40 @	38 @	35 @
Colombo scrap No. 2	38 @	36 @	34 @
EAST INDIAN—			
Assam crêpe	@	None	48 @
Assam onions	@	None	@
Penang block scrap	@	None	@
PONTIANAK—			
Banjermassin	@	12 @	11 @12
Palembang	@	None	12¾ @
Pressed block	@	24 @	22½ @
Sarawak	@	None	09¾ @
SOUTH AMERICAN—			
PARAS—			
Upriver fine	62 @	54½ @	52½ @53
Upriver medium	56 @	52 @	50 @
Upriver coarse	37 @	33 @	34½ @
Upriver weak, fine	@	41 @	41 @
Islands, fine	@	47½ @	47½ @48
Islands, medium	@	45 @	45 @
Islands, coarse	@	22 @	21½ @
Cameta, coarse	@	22½ @	23 @
Madeira, fine	@	56 @	53½ @
Acre Bolivian, fine	@	55 @ 55½	53½ @
Peruvian fine	@	52 @	51 @
Tapajos fine	@	53 @	50 @
CAUCHO—			
Lower caucho ball	@	31½ @	31 @
Upper caucho ball	37 @	33 @	35½ @
MANICOBAS—			
Ceara negro heads	@	38 @	40 @
Ceara scrap	@	28 @	30 @
Maniçoba (30% guarantee)	@	35 @	37 @
Mangabeira thin sheet	@	38 @	40 @
CENTRALS—			
Corinto scrap	38 @	33 @	34 @34½
Esmeralda sausage	38 @	32 @	34 @34½
Central scrap	38 @	32 @	34 @34½
Central scrap and strip	36½ @	29 @30	30 @
Central wet sheet	27 @	23 @	24 @24½
Guayule (20% shrinkage)	@	24 @	27 @
Guayule, dry	35 @	35 @	36 @
AFRICANS—			
Niger flake, prime	28 @	@	18 @
Benguela, extra No. 1, 28%	@	@	@
Benguela No. 2, 32½%	@	25½ @	26½ @
Congo prime, black upper	@	39 @	@
Congo prime, red upper	@	@	@
Rio Nunez ball	@	@	@
Rio Nunez sheets and strings	@	@	@
Conakry niggers	@	@	@
Massai sheets and strings	@	@	@
GUTTA PERCHA—			
Gutta Siak	28 @	25 @	23 @ 25
Red Macassar	@	None	2.60@2.75
BALATA—			
Block, Ciudad, Bolivar	71 @	76 @	57 @60
Colombia	60 @	56 @	48 @50
Panama	58 @	45 @	40 @45
Surinam sheet	95 @	@	84 @85
amber	97 @	@	87 @88

RECLAIMED RUBBER.

The reclaimed rubber market has shown marked improvement the past month. Boot and shoe reclaims have been in strong demand due to activity in the carriage cloth, automobile topping and insulated wire trades. There has been slight improvement also in the call for tire reclaims by the mechanical goods trade. Prices remain unchanged from last month's quotations.

NEW YORK QUOTATIONS.

October 25, 1919.

Subject to change without notice.

Standard reclaims:				
Floating	*lb.*	.30	@	.35
Friction	*lb.*	.25	@	.35
Mechanical	*lb.*	.11	@	.16
Red	*lb.*	.20	@	.25
Shoe	*lb.*	.15	@	.15¾
Tires, auto	*lb.*	.15	@	.16¾
truck	*lb.*	.11½	@	.12½
White	*lb.*	.22	@	.25

THE MARKET FOR COMMERCIAL PAPER.

In regard to the financial situation, Albert B. Beers, broker in crude rubber and commercial paper, No. 68 William street, New York City, advises as follows:

"During October there has been a fair demand for paper, mostly from out-of-town banks, and the best rubber names have been taken at 5½ to 5¾ per cent, and those not so well known 6 to 6½ per cent."

ANTWERP RUBBER MARKET.

GRISAR & CO., Antwerp, report [October 31, 1919]:

The market has continued firm during the past week although the demand has quieted down somewhat. The stock in Antwerp was 2,234 tons. Business in futures was a little quieter; 132,500 kilograms were registered. Prices at closing ranged from 9.45 to 9.55 francs.

SINGAPORE WEEKLY RUBBER REPORT.

GUTHRIE & CO., LIMITED, Singapore, report [September 14, 1919]:

Influenced partly by advices of higher values in London, the rubber auctions which opened on Wednesday showed further advances in prices. At the commencement fine pale crêpe realized up to 85½ cents per pound (three lots sold at 86 cents), showing an advance on the week of 3½ cents. Ribbed smoked sheet was in good demand at 84/85 cents (three lots realized 85½ cents), which figure is 6 cents up on the week.

On the second day the tone of the market was distinctly easiér and closing prices may be given as 84½ cents for crêpe and 83½ for sheets

Lower grades were in good demand at 2½/4½ cents advance on last week.

The quantity catalogd was 1 035 tons, of which 948 tons were offered and 728 tons sold.

The following is the course of values:

	In Singapore, per Pound.[1]	Sterling Equivalent per Pound in London.
Sheet, fine ribbed smoked	83c @ 85c	[illegible]
Sheet, good ribbed smoked	74 @ 83	1/11⅜ @ 2/ 2
Crêpe, fine pale	83½ @ 85½	[illegible]
Crêpe, good pale	75 @ 83	[illegible] @ 2/ 2½

[1]Quoted in S. S. Currency —$1 = $0.567.

AMSTERDAM MARKET REPORT.

JOOSTEN & JANSSEN, Amsterdam, report [October 24, 1919]:

During the past week the rubber market was very animated. Several parcels spot and afloat, c.i.f. Amsterdam, changed hands and also a part of the new arrivals, originally destined for subscription sale, were sold privately, on a basis of about f. l. 38-l. 42½ for *Hevea* standard quality.

On the terminal market, too, some contracts were closed for November and March delivery at f. l. 39 and for delivery in August at f. l. 38½.

BATAVIA RUBBER MARKET.

HERMANS, MARSMAN & CO., Batavia, report [July 15-August 15, 1919]:

The market opened with a very weak tendency and prices decreased to $.456 for fine pale crêpe and $.448 for prime smoked sheets. In the beginning of this month prices improved a little on account of more demand from the United States. Speculators are paying good prices for October-December delivery, but only little is offered for this forward delivery. The market closed with the following quotations:

	In Batavia Per ½-kilo.[1] Guilders.	Equivalent Per ½-kilo in U. S. Currency.
Fine pale crêpe	1.20	$0.480
First pale crêpe	1.15	0.460
Prime smoked sheets	1.17	0.468
Fine pale crêpe basis 75 per cent	1.12	0.448

[1] Quoted per ½-kilo (1.1 lb.) in Dutch Indian guilders ($0.40).

CEYLON RUBBER IMPORTS AND EXPORTS.

IMPORTS.

	January 1 to September 8.	
	1918.	1919.
Crude rubber:		
From Straits Settlements ... *pounds*	1,523,919	1,680,728
India	2,158,976	953,551
Burma and other countries	3,107	....
Totals	3,686,002	2,634,279

EXPORTS.

	1918.	1919.
Crude rubber:		
To United Kingdom ... *pounds*	12,664,651	19,944,621
Belgium	....	29,120
France	470,207	330,010
[1]Victoria	513,119	98,755
[1]New South Wales	294,787	154,212
United States	12,685,166	41,048,225
Canada and Newfoundland	5,124,498	260,026
India	2,329	2,313
Straits Settlements	....	454
Japan	206,058	186,626
Totals	31,915,815	62,054,362

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official report from Singapore states that the export of rubber from Straits Settlements ports in the month of August amounted to 8,933 tons (of which 1,286 tons were transshipments), which compares with 7,818 tons in July, and 1,249 tons in the corresponding month last year. The total for eight months of the present year is 99,476 tons, compared with 45,407 tons in 1918 and 50,653 tons in 1917. Comparative statistics follow:

	1917.	1918.	1919.
January ... tons	[illegible]	[illegible]	[illegible]
February	6,495	2,334	15,661
March	8,299	8,858	20,908
April	6,103	6,584	10,848
May	6,282	13,587	15,845
June	8,775	6,515	5,059
July	7,351	1,978	7,818
August	3,786	1,249	8,933
Totals	50,653	45,407	99,476

FEDERATED MALAY STATES RUBBER EXPORTS.

An official report from Kuala Lumpur states that the Federated Malay States exported 10,626 tons of plantation rubber in the month of August, as against 8,640 tons in July and 5,291 tons in the corresponding month last year. The total export for eight months amounted to 69,983 tons, compared with 51,554 tons for the corresponding period in 1918 and 51,761 tons in 1917. Appended are the comparative statistics:

	1917.	1918.	1919.
January ... *tons*	5,995	7,588	7,163
February	7,250	6,820	10,809
March	7,088	7,709	10,679
April	5,955	7,428	7,664
May	7,179	5,851	7,308
June	6,009	5,161	7,094
July	5,798	5,706	8,640
August	6,487	5,291	10,626
Totals	51,761	51,554	69,983

PLANTATION RUBBER EXPORTS FROM THE FAR EAST.

Six Months Ended June 30, 1919.

	Singapore.	Penang.	Port Swettenham.	Malacca.	Totals.
To Great Britain ... *pounds*	32,832,534	14,634,119	21,203,154	1,415,462	70,085,269
Europe	8,328,267	......	......	......	8,328,267
United States:					
New York.	88,225,331	4,701,789	1,432,649	......	94,359,769
Pacific Ports	56,928,397	3,360,713	108,549	......	60,397,659
Japan	9,388,133	275,147	......	......	9,663,280
Canada	2,199,467	179,283	28,000	......	2,406,750
South America	64,933	......	......	......	64,933
Colombo	198,534	204,625	890,974	......	1,294,133
Australian Ports	212,667	......	......	......	212,667
Totals	198,378,263	23,355,676	23,663,326	1,415,462	246,812,727

(*Compiled by R. F. Bradford, Penang, Straits Settlements.*)

PLANTATION RUBBER EXPORTS FROM JAVA.

	July.		Six Months Ended July 31.	
	1918.	1919.	1918.	1919.
To Holland ... *kilos*	....	236,000	....	415,000
England	....	790,000	1,659,000	4,605,000
United States	389,000	458,000	4,551,000	10,564,000
Canada	....	....	....	36,000
Singapore	841,000	123,000	5,207,000	3,086,000
Japan	7,000	....	641,000	179,000
Australia	....	....	....	169,000
Other countries	....	....	510,000	12,000
Totals	1,237,000	1,607,000	12,568,000	19,066,000
Ports of origin:				
Tandjong Priok	806,000	968,000	6,212,000	10,116,000
Semarang	10,000	57,000	115,000	317,000
Soerabaya	419,000	582,000	5,776,000	8,069,000
Tjilatjap	....	....	....	149,000
Totals	1,235,000	1,607,000	12,103,000	18,651,000

EXPORTS OF INDIA RUBBER FROM MANAOS DURING THE MONTH OF AUGUST, 1919.

	NEW YORK.					EUROPE.					
Exporters.	Fine.	Medium.	Coarse.	Caucho.	Total.	Fine.	Medium.	Coarse.	Caucho.	Totals.	Grand Totals.
Tancredo, Porto & Co. ... *kilos*	382,349	33,665	107,098	235,888	759,000	94,093	37,910	......	17,997	150,000	909,000
T. A. Mendes & Co.	194,093	32,148	132,428	315,919	674,588	58,310	......	......	......	58,310	732,898
Stowell & Co.	111,898	90,768	62,745	53,581	318,992	93,523	1,889	6,663	106	102,181	421,173
General Rubber Co. of Brazil	112,755	9,191	63,761	109,293	295,000	55,903	3,308	789	....	60,000	355,000
Y. G. Araujo	....	....	....	....		95,040	2,560	2,550	....	100,150	100,150
Adelbert H. Alden, Limited	3,400	3,276	16,863	5	23,544	50,045	....	46	22,648	72,739	96,283
A. Souza & Co.	14,921	728	2,046	64,592	82,287	....	....	....	....	....	82,287
Ohliger & Co.	30,666	16,800	988	10,086	58,540	....	....	....	....	....	58,540
Simfronio & Co.	31,732	381	2,508	6,147	40,768	....	....	....	....	....	40,768
Chase Import & Export Corp.	14,884	9,264	4,459	2,800	31,407	....	....	....	....	....	31,407
C. Zencovich	....	....	....	....		24,849	1,823	1,564	147	28,383	28,383
Francisco Salles Vieira	7,128	....	2,062	10,158	19,348	1,050	....	....	....	1,050	20,398
Moraes, Carneiro Co.	13,181	1,101	4,463	1,250	19,995	....	....	....	....	....	19,995
Higson & Fall	.....	.	.	14,570	14,570	....	....	....	....	....	14,570
B. Lévy & Co.	10,443	637	1,580	....	12,660	....	....	....	....	....	12,660
M. Corbacho & Co.	2,885	320	212	....	3,417	....	....	....	....	....	3,417
Total, Manáos	930,335	198,279	401,213	824,289	2,354,116	472,813	47,490	11,612	40,898	572,813	2,926,929
In transit, Iquitos	196	17,566	969	3,082	21,813	5,153	6,382	1,388	64,017	76,940	98,753
Totals	930,531	215,845	402,182	827,371	2,375,929	477,966	53,872	13,000	104,915	649,753	3,025,682

(*Compiled by Stowell & Co., Manáos, Brazil.*)

CRUDE RUBBER ARRIVALS AT ATLANTIC AND PACIFIC PORTS AS STATED BY SHIPS' MANIFESTS.

PARAS AND CAUCHO AT NEW YORK.

Pounds.

	Fine	Medium	Coarse	Caucho	Mixed Rubber	Totals, Pounds
SEPTEMBER 18. By the S. S. *Holbein*, from Pará.						
H. A. Astlett & Co	‡150,506	......	‡53,200	‡127,000	***4,500	335,200
G. Amsinck & Co., Inc.	......	......	......	......	***20	6,113
Poel & Kelly	93,062	1,066	‡1,952	‡105,085	1,300	202,465
Various	......	......	7	212	607	437,805
SEPTEMBER 23. By the S. S. *Marpesa*, from Buenos Aires.						
Various	......	......	......	......	44	12,980
SEPTEMBER 29. By the S. S. *Bivan*, from Pará and Manáos.						
General Rubber Co.	1,513	33	43	......	......	520,500
H. A. Astlett & Co.	‡172,800	......	‡41,000	‡74,000	......	287,800
Raw Products Co.	71	......	......	......	......	23,430
Poel & Kelly	‡54,137	‡2,350	‡1,216	......	......	57,703
Meyer & Brown, Inc.	†281,400	......	......	‡7,000	......	288,400
G. Amsinck & Co., Wigmore	72	101	31	......	......	64,530
Paul Bertuch	*2,759	......	......	......	......	922,770
Various	*950	24	215	304	2	477,372
Various	......	......	......	......	......	......
OCTOBER 2. By the S. S. *Mayaro*, from Ciudad Bolivar.						
South & Central America Commercial Co.	‖158	......	......	......	......	18,810
OCTOBER 3. By the S. S. *Carmania*, at New York.						
Poel & Kelly	......	......	......	‡159,808	......	‡159,808
OCTOBER 5. By the S. S. *General O. H. Ernst*, from Cristobal.						
G. Amsinck & Co., Inc.	¶300	......	¶33	......	......	20,645
OCTOBER 7. By the S. S. *Rivera*, from Montevideo.						
Neuss, Hesslein & Co.	154**	......	......	......	......	6,721
Everett Heany	......	......	......	......	♮417	181,395
Various	......	......	......	......	♮198	86,130
OCTOBER 14. By the S. S. *Belgic*, from Liverpool.						
Poel & Kelly	......	......	......	607	......	156,501
OCTOBER 15. By the S. S. *Tennyson*, from Pará.						
F. R. Henderson & Co.	‡9,920	‡6,720	......	‡6,720	***4,480	27,840
H. A. Astlett & Co.	‡39,500	......	‡8,400	......	***14,000	61,900
G. Amsinck & Co., Inc.	‡119,967	‡3,390	‡9,367	‡2,092	......	64,816
Raw Products Co.	256	......	......	......	......	89,600
Wm. Schall & Co.	‡341,600	......	‡28,560	‡531,560	......	901,720
Poel & Kelly	‡62,900	‡2,900	‡3,100	‡1,700	***1,300	71,900
Various	§1,440	......	......	3,640	......	5,080
OCTOBER 19. By the S. S. *Bronte*, from Buenos Aires.						
Various	......	......	......	......	6,683	3,414,768

*Including skins. †Pounds, including medium. ‡Pounds. ¶Bales. ‖Bags and packages. **Packages, including caucho. ♮Bundles. ***Pounds, cametá. §Including extra fine and coarse.

PLANTATIONS.

(Figured 180 pounds net to the bale or case.)

	Shipment from:	Shipped to:	Pounds.	Totals.
SEPTEMBER 10. By the S. S. *Monteagle*, at Vancouver.				
F. R. Henderson & Co.	Hongkong	Seattle	205,100	
Federal Export Corp.	Hongkong	New York	69,940	276,040
SEPTEMBER 16. By the S. S. *Colusa*, at San Francisco.				
The B. F. Goodrich Co.	Singapore	San Fran'co	1,291,320	
The B. F. Goodrich Co.	Penang	Akron, Ohio	297,900	
Firestone Tire & Rubber Co.	Singapore	Akron, Ohio	534,780	
Firestone Tire & Rubber Co.	Penang	Akron, Ohio	163,000	
Poel & Kelly	Singapore	San Francisco	151,660	
Pacific Trading Corp. of America	Penang	New York	133,020	
Various	Singapore	New York	45,900	2,517,580
SEPTEMBER 19. By the S. S. *Toyama Maru*, at New York.				
William H. Stiles & Co.	Singapore	New York	30,960	
L. Littlejohn & Co., Inc.	Singapore	New York	302,400	
Poel & Kelly	Singapore	New York	50,400	
Jaeger & Co.	Singapore	New York	45,900	
Gaston, Williams & Wigmore	Singapore	New York	43,100	
E. S. Kuh & Valk Co.	Singapore	New York	33,660	
Fred Stern & Co.	Singapore	New York	20,160	
Various	Singapore	New York	202,500	729,080
SEPTEMBER 19. By the S. S. *Abron*, at New York.				
Chas. T. Wilson Co., Inc.	Colombo	New York	65,700	
The Goodyear Tire & Rubber Co.	Colombo	Akron, Ohio	323,563	
L. Littlejohn & Co., Inc.	Colombo	New York	251,820	
Meyer & Brown, Inc.	Colombo	New York	216,000	
Poel & Kelly	Colombo	New York	182,520	
C. C. Trevanion & Co.	Colombo	New York	79,200	1,118,803
SEPTEMBER 19. By the S. S. *Empress of Japan*, at Vancouver.				
Firestone Tire & Rubber Co.	Hongkong	Akron, Ohio	282,600	
SEPTEMBER 22. By the S. S. *Empress of Russia*, at Vancouver.				
Firestone Tire & Rubber Co.	Hongkong	Akron, Ohio	161,960	
The Fisk Rubber Co.	Hongkong	Chicopee Falls	96,300	
F. R. Henderson & Co.	Singapore	New York	184,000	442,260
SEPTEMBER 22. By the S. S. *Floseric*, at New York.				
Meyer & Brown, Inc.	Colombo	New York	67,200	
Poel & Kelly	Colombo	New York	46,177	
Littlejohn & Co., Inc.	Singapore	New York	28,000	
W. R. Grace & Co.	Colombo	New York	35,280	
Various	Colombo	New York	63,440	240,097
SEPTEMBER 22. By the S. S. *Wauchusett*, at New York.				
F. R. Henderson & Co.	Singapore	New York	231,840	
William H. Stiles & Co.	Singapore	New York	79,200	
J. T. Johnstone & Co., Inc.	Soerabaya	New York	11,500	
L. Littlejohn & Co., Inc.	Singapore	New York	784,000	
L. Littlejohn & Co., Inc.	Soerabaya	New York		
L. Littlejohn & Co., Inc.	Batavia	New York	208,260	
The Goodyear Tire & Rubber Co.	Singapore	Akron, Ohio	201,600	
The Goodyear Tire & Rubber Co.	Batavia	Akron, Ohio	109,800	
United Malaysian Rubber Co., Ltd.	Singapore	New York	94,320	
Jaeger & Co., Ltd.	Singapore	New York	91,980	
Rutger & Bleecker	Singapore	New York	78,580	
Fred Stern & Co.	Batavia	New York	84,600	
Winter, Ross & Co.	Singapore	New York	72,000	
Winter, Ross & Co.	Soerabaya	New York	33,840	
Peninsular Trading Agency	Soerabaya	New York	17,280	2,098,800
SEPTEMBER 22. By the S. S. *Valencia*, at New York.				
T. D. Downing & Co.	London	New York	466,380	
Poel & Kelly	London	New York	9,453	
Various	London	New York	642,420	1,118,253
SEPTEMBER 24. By the S. S. *Port Bowen*, at New York.				
The Goodyear Tire & Rubber Co.	Liverpool	Akron	51,480	
Poel & Kelly	Liverpool	New York	45,139	
Curry, McPhillips & Co.	Liverpool	New York	2,522	99,141
SEPTEMBER 24. By the S. S. *Kentucky*, at New York.				
L. Littlejohn & Co., Inc.	Colombo	New York	58,000	
Poel & Kelly	Colombo	New York	38,321	96,321
SEPTEMBER 25. By the S. S. *Michigan*, at New York.				
T. D. Downing & Co.	London	New York	54,540	
Various	London	New York	470,160	524,700
SEPTEMBER 25. By the S. S. *Lapland*, at New York.				
Various	Southampton	New York	149,080	149,080
SEPTEMBER 26. By the S. S. *Marengo*, at New York.				
Curry, McPhillips & Co.	Hull	New York	59,580	59,580
SEPTEMBER 26. By the S. S. *Triumph*, at New York.				
F. R. Henderson & Co.	London	New York	56,000	
Various	London	New York	45,880	101,880
SEPTEMBER 26. By the S. S. *Persia Maru*, at San Francisco.				
F. R. Henderson & Co.	Hongkong	New York	485,928	
Firestone Tire & Rubber Co.	Hongkong	Akron	61,740	547,668
SEPTEMBER 27. By the S. S. *Kashima Maru*, at Seattle[1].				
Rubber Trading Co.	Singapore	Seattle	159,040	
Geo. S. Bush & Co., Inc.	Singapore	New York	80,100	
Geo. S. Bush & Co., Inc.	Singapore	Akron	44,640	
Various			415,880	699,660

[1] Ex. Nippon Yusen Kaisha S. S. *Kashima Maru*, from Yokohama.

	Shipment from:	Shipped to:	Pounds.	Totals.
SEPTEMBER 27. By the S. S. *Oneka*, at New York.				
Meyer & Brown, Inc.	Colombo	New York	60,000	
Poel & Kelly	Hongkong	New York	30,126	
L. Littlejohn & Co., Inc.	Colombo	New York	22,900	113,026
SEPTEMBER 28. By the S. S. *City of Lahore*, at New York.				
L. Littlejohn & Co., Inc.	Colombo	New York	100,800	
Poel & Kelly	Colombo	New York	27,215	128,015
SEPTEMBER 29. By the S. S. *Nagano Maru*, at New York.				
Poel & Kelly	Colombo	New York	234,970	
Meyer & Brown, Inc.	Colombo	New York	162,000	
Fred Stern & Co.	Colombo	New York	89,800	
Chas. T. Wilson Co., Inc.	Colombo	New York	44,640	
Various	Colombo	New York	18,360	549,770
SEPTEMBER 30. By the S. S. *Baltic*, at New York.				
Aldens' Successors, Ltd.	Liverpool	New York	47,433	47,433
OCTOBER 1. By the S. S. *Tyndareus*, at Vancouver.				
Fred Stern & Co.	Singapore	Seattle	104,400	138,000
Poel & Kelly	Singapore	Vancouver	33,600	
OCTOBER 1. By the S. S. *Mesaba*, at New York.				
Robinson & Co.	London	New York	46,980	
Meyer & Brown	London	New York	44,800	91,780
OCTOBER 1. By the S. S. *Western Cross*, at New York.				
F. R. Henderson & Co.	Batavia	New York	1,090,008	
The B. F. Goodrich Co.	Batavia	Akron, Ohio	364,140	
Firestone Tire & Rubber Co.	Batavia	Akron, Ohio	144,720	
J. T. Johnstone & Co.,	Batavia	New York	125,500	
Aldens' Successors, Inc.	Soerabaya	New York	55,562	
William H. Stiles & Co.	Batavia	New York	50,940	
Manhattan Rubber Mfg. Co.	Soerabaya	New York	27,000	
L. Littlejohn & Co., Inc.	Soerabaya	New York	896,000	
Winter, Ross & Co.	Soerabaya	New York	402,840	
Winter, Ross & Co.	Batavia	New York	346,140	
Chas. T. Wilson Co., Inc.	Batavia	New York	16,800	
The Goodyear Tire & Rubber Co.	Batavia	New York	356,400	
Fred Stern & Co.	Batavia	New York	245,543	
Poel & Kelly	Batavia	New York	141,660	
Poel & Kelly	Soerabaya	New York	84,780	
Mitsui & Co., Ltd.	Batavia	New York	90,000	

(S. S. *Western Cross*—Continued.)

	Shipment from:	Shipped to:	Pounds	Totals
Edward Maurer Co., Inc.	Batavia	New York	86,220	
Kidder, Peabody & Co..	Soerabaya	New York	82,800	
Peninsular Trading Agency	Batavia	New York	75,060	
Gaston, Williams & Wigmore	Soerabaya	New York	68,220	
Gaston, Williams & Wigmore	Batavia	New York	49,860	
Vernon Metal & Produce Co.	Soerabaya	New York	49,860	5,332,235
October 2. By the S. S. *Rangoon Maru*, at New York.				
F. R. Henderson & Co..	Colombo	New York	149,600	
William H. Stiles & Co..	Colombo	New York	20,240	
Chas. T. Wilson Co., Inc.	Colombo	New York	10,080	
Meyer & Brown, Inc....	Colombo	New York	263,800	
L. Littlejohn & Co., Inc.	Colombo	New York	179,200	
Poel & Kelly...........	Colombo	New York	59,785	
C. C. Trevanion & Co..	Colombo	New York	50,400	730,105
October 2. By the S. S. *Bengkalis*, at San Francisco.				
General Rubber Co......	Batavia	New York	54,000	
Thornett & Fehr........	Batavia	New York	19,980	
Thornett & Fehr........	Soerabaya	New York	6,300	
Firestone Tire & Rubber Co.	Batavia	New York	6,120	
Various[2]	Batavia	New York	54,360	140,760

[2] 360 pounds shortshipped.

	Shipment from:	Shipped to:	Pounds	Totals
October 3. By the S. S. *Wyandotte*, at Boston.				
Aldens' Successors, Inc..	London	Boston	56,510	56,510
October 3. By the S. S. *Carmania*, at New York.				
Poel & Kelly...........	Liverpool	New York	157,498	
General Rubber Co......	Liverpool	New York	99,360	
The Fisk Rubber Co....	Liverpool	Chicopee Falls, Mass.	41,120	297,978
October 4. By the S. S. *Norman Monarch*, at New York				
Poel & Kelly...........	London	New York	40,951	
L. Littlejohn & Co., Inc.	Colombo	New York	33,600	74,551
October 5. By the S. S. *Ariosto*, at New York.				
William H. Stiles & Co..	Colombo	New York	30,240	
Gaston, Williams & Wigmore	Colombo	New York	209,700	
The Goodyear Tire & Rubber Co..........	Colombo	Akron, Ohio	139,680	
Fred Stern & Co........	Colombo	New York	69,120	
Volkhart Bros.	Colombo	New York	43,200	
C. C. Trevanion & Co..	Colombo	New York	33,660	
L. Littlejohn & Co., Inc.	Colombo	New York	238,000	
Thornett & Fehr........	Colombo	New York	12,600	776,200
October 6. By the S. S. *Glensanda*, at New York.				
Aldens' Successors, Inc..	Rotterdam	New York	176,611	176,611
October 6. By the S. S. *Ceylon Maru*, at New York.				
The Goodyear Tire & Rubber Co.	Colombo	New York	60,300	
Meyer & Brown, Inc....	Colombo	New York	168,000	
L. Littlejohn & Co., Inc..	Colombo	New York	168,000	
Poel & Kelly...........	Colombo	New York	102,355	498,655
October 6. By the S. S. *Galileo*, at New York.				
Curry, McPhillips & Co..	Hull	New York	65,340	65,340
October 6. By the S. S. *Indianola*, at New York.				
Aldens' Successors, Inc..	London	New York	1,192,434	
The B. F. Goodrich Rubber Co.	London	Akron, O.	809,640	
Poel & Kelly...........	London	New York	301,410	
L. Littlejohn & Co., Inc.	London	New York	168,300	
T. D. Downing..........	London	New York	54,000	
Vernon Metal & Produce Co.	London	New York	26,640	
Various	London	New York	1,832,686	4.385,110
October 6. By the S. S. *Lancastrian*, at New York.				
Curry, McPhillips & Co.	Antwerp	New York	10.890	10,890
October 6. By the S. S. *Homestead*, at New York.				
F. R. Henderson & Co..	Singapore	New York	551,827	
J. T. Johnstone & Co...	Penang	New York	255,000	
Aldens' Successors, Inc..	Singapore	New York	112,038	
William H. Stiles & Co..	Singapore	New York	83,700	
Hood Rubber Co........	Singapore	Watertown	71,980	
Rubber Trading Co......	Singapore	New York	67,200	
Pell & Dumont, Inc.....	Singapore	New York	63,000	
Chas. T. Wilson Co., Inc.	Penang	} New York	78,400	
Chas. T. Wilson Co., Inc.	Singapore			
Pacific Trading Corp. of America	Singapore	New York	44,460	
Raw Products Co.......	Singapore	New York	30,240	
W. S. Ryckman Co., Inc..	Singapore	New York	180	
L. Littlejohn & Co., Inc..	Singapore	New York	1,657,600	
Poel & Kelly...........	Singapore	New York	515,640	
Fred Stern & Co........	Singapore	New York	448,000	
Edward Maurer Co., Inc.	Singapore	New York	437,040	
Rubber Importers & Dealers Co., Inc..........	Singapore	New York	280,980	
Gaston, Williams & Wigmore	Singapore	New York	254,060	
Thos. A. Desmond & Co.	Singapore	New York	238,320	
Jaeger & Co............	Singapore	New York	156,060	
East Asiatic Co.........	Singapore	New York	98,280	
Joosten & Janssen.......	Singapore	New York	89,820	
Mitsui & Co., Ltd.......	Singapore	New York	79,740	
Winter, Ross & Co......	Singapore	New York	75,780	
Vernon Metal & Produce Co.	Singapore	New York	61,200	
T. Jay France..........	Singapore	New York	45,000	
Rogers-Pyatt Shellac Co.	Singapore	New York	41,940	
The Goodyear Tire & Rubber Co.	Singapore	New York	1,889	
Frank F. Waterhouse & Co.	Singapore	New York	540	
Various	Singapore	New York	948,573	6,788,487
October 7. By the S. S. *Methven*, from Singapore, at Seattle				
Firestone Tire & Rubber Co.	Singapore	Akron	780,840	
F. R. Henderson & Co..	Singapore	Seattle	284,000	
Raw Products Co......	Singapore	New York	57,600	
Raw Products Co......	Penang	New York	12,240	
The Gates Rubber Co...	Singapore	Denver, Colo.	128,520	
[3]L. Littlejohn & Co., Inc.	Port Sw't'nh'n	New York	49,500	
Thos. A. Desmond & Co.	Singapore	New York	48,060	
Poel & Kelly...........	Penang	New York	47,160	
Joosten & Janssen......	Penang	New York	34,380	1,44[illegible] 360

[3] Four cases shortshipped.

	Shipment from:	Shipped to:	Pounds	Totals
October 8. By the S. S. *West Conoc*, at San Francisco.				
F. R. Henderson & Co..	Hongkong	New York	194,400	
Fred Stern & Co........	Hongkong	New York	134,460	
Various	Hongkong	Boston	25,200	354 060
October 9. By the S. S. *Noordam*, at New York.				
Aldens' Successors, Inc..	Rotterdam	Hoboken	89,600	
Meyer & Brown, Inc...	Rotterdam	New York	224,000	313,600
October 10. By the S. S. *Matappo*, from Calcutta, at New York.				
Hood Rubber Co.......	Colombo	Watertown	11,220	
L. Littlejohn & Co., Inc.	Colombo	New York	179,200	
Chas. T. Wilson & Co., Inc.	Colombo	New York	33,600	
Various	Colombo	New York	139,200	363,220
October 10. By the S. S. *Independence*, at New York.				
[4]The B. F. Goodrich Co.	London	Akron	677,700	
Rubber Trading Co.....	London	New York	22,400	700,100

[4] 1,204 cases shortshipped.

	Shipment from:	Shipped to:	Pounds	Totals
October 10. By the S. S. *City of Birmingham*.				
L. Littlejohn & Co., Inc.	Colombo	New York	280,000	280.000
October 14. By the S. S. *Belgic*, at New York.				
F. R. Henderson & Co..	Liverpool	New York	112,000	
Aldens' Successors, Inc.	Liverpool	New York	61,920	
Thos. A. Desmond & Co.	Liverpool	New York	87,980	
L. Littlejohn & Co., Inc.	Liverpool	New York	78,400	340,300
October 14. By the S. S. *East Indian*, at New York.				
H. P. Winter & Co....	London	New York	67,200	
The Goodyear Tire & Rubber Co.	London	Akron, Ohio	540	67,740
October 14. By the S. S. *Saxonia*, at New York.				
T. R. Downing & Co....	London	New York	68,760	
Various	London	New York	212,760	281,520
October 14. By the S. S. *Korea Maru*, at San Francisco.				
F. R. Henderson & Co..	Hongkong	San Fran.	112,000	
Thornett & Fehr........	Hongkong	New York	23,040	135,040
October 14. By the S. S. *Bardic*, at New York.				
Rubber Trading Co....	London	New York	33,600	
Thos. A. Desmond & Co.	London	New York	143,820	
T. D. Downing & Co..	London	New York	76,320	
Various	London	New York	178,100	431,840
October 15. By the S. S. *Yelsdijk*, at New York.				
General Rubber Co.....	Soerabaya	New York	320,000	
Manhattan Rubber Manufacturing Co.	Batavia	New York	56,160	
J. T. Johnstone & Co....	Soerabaya	New York	35,500	
Winter, Ross & Co.....	Batavia	New York	440,280	
Kuharah Trading Co., Ltd.	Batavia	New York	200,340	
Peninsular Trading Co..	Batavia	New York	201,600	
Peninsular Trading Co..	Soerabaya	New York	48,240	
Poel & Kelly...........	Batavia	New York	7,920	
Meyer & Brown, Inc...	Batavia	New York	2,520	
Various	Batavia	New York	306,180	
United Malaysian Rubber Co., Ltd.	Borneo	New York	9,327	1,628,067
October 15. By the S. S. *Gaelic Prince*, at New York.				
F. R. Henderson & Co..	Singapore	New York	872,050	
William H. Stiles & Co..	Singapore	New York	305,100	
Chas. T. Wilson & Co., Inc.	Singapore	New York	69,440	
J. T. Johnstone & Co. Inc.	Medan	New York	98,100	
Hood Rubber Co.......	Singapore	Watertown	89,733	
W. G. Ryckman, Inc....	Singapore	New York	87,300	
United States Rubber Co.	Singapore	New York	79,560	
Rubber Trading Co.....	Singapore	New York	56,000	
Pell & Dumont, Inc....	Singapore	New York	50,400	
Poel & Kelly...........	Singapore	New York	377,640	
Thos. A. Desmond & Co.	Singapore	New York	365,400	
The Goodyear Tire & Rubber Co.	Singapore	New York	324,540	
The Goodyear Tire & Rubber Co...........	Medan	New York	46,440	
Meyer & Brown, Inc....	Singapore	New York	268,800	
Rubber Importers & Dealers Company.........	Singapore	New York	171,000	
Fred Stern & Co.......	Singapore	New York	162,180	
Fred Stern & Co........	Medan	New York	43,200	
Gaston, Williams & Wigmore	Singapore	New York	113,040	
Hadden & Co...........	Singapore	New York	105,840	
Edward Boustead & Co..	Singapore	New York	79,020	
East Asiatic Co.........	Singapore	New York	47,880	
Mitsui & Co., Limited...	Singapore	New York	44,880	
Eastern Rubber Co......	Singapore	New York	40.860	

(S. S. [illegible])

	Shipment from	Shipped to	Pounds.	Totals.
Curry, McPhillips & Co..	Singapore	New York	38,880	
Jaeger & Co., Ltd......	Singapore	New York	27,540	
Gravenhorst & Co.......	Manila, P. I.	New York	23,220	
Federal Products Co....	Singapore	New York	22,320	
Joosten & Janssen......	Singapore	New York	3,600	
Various	Singapore	New York	198,180	
Various	Singapore	New York	141,700	4,353,843
OCTOBER 16. By the S. S. *Calcutta Maru*, at New York.				
Chas. T. Wilson Co., Inc.	Colombo	New York	56,000	
William H. Stiles & Co..	Colombo	New York	30,240	
Aldens' Successors, Inc..	Colombo	New York	22,400	
L. Littlejohn & Co., Inc.	Colombo	New York	179,200	
Meyer & Brown, Inc ...	Colombo	New York	150,100	
Fred. Stern & Co.......	Colombo	New York	89,600	
The Goodyear Tire & Rubber Co...........	Colombo	New York	48,960	
C. C. Trevanion & Co...	Colombo	New York	45,360	
Rogers-Pyatt Shellac Co.	Colombo	New York	37,080	
Poel & Kelly...........	Colombo	New York	36,720	
Various	Colombo	New York	57,600	753,260
OCTOBER 17. By the S. S. *Vardulia*, at New York.				
Poel & Kelly...........	London	New York	519,720	
L. Littlejohn & Co., Inc.	London	New York	264,000	
Chas. T. Wilson Co., Inc.	London	New York	56,000	
Various	London	New York	749,860	1,589,580
OCTOBER 19. By the S. S. *Invincible*, at New York.				
L. Littlejohn & Co., Inc.	London	New York	258,480	
Edward Maurer Co., Inc.	London	New York	191,880	
Various	London	New York	831,100	1,281,460

CENTRALS.

	Shipment from:	Shipped to:	Pounds.	Totals.
SEPTEMBER 22. By the S. S. *Advance*, at New York.				
Mecke & Co............	Cristobal	New York	2,400	
G. Amsinck & Co., Inc..	Cristobal	New York	2,200	
South & Central American Commercial Co....	Cristobal	New York	400	5,000
SEPTEMBER 26. By the S. S. *Panama*, at New York.				
Chas. E. Griffin.........	Cristobal	New York	600	
Isaac Brandon & Bros...	Cristobal	New York	500	1,100
SEPTEMBER 27. By the S. S. *Abangarez*, at New York.				
Isaac Brandon & Bros...	Cristobal	New York	200	200
SEPTEMBER 27. By the S. S. *Zethon*, at New York.				
A. S. Cookman & Co...		New York	100	100
OCTOBER 2. By the S. S. *Mayaro*, from Trinidad, at New York.				
Southern Sales Corp....	Ciudad Bolivar	New York	4,500	
[6]Middleton & Co........	Ciudad Bolivar	New York	4,300	8,800
OCTOBER 10. Ex S. S. *Gauca*, from South Pacific, at New York.[7]				
G. Amsinck & Co., Inc..	Colon	New York	6,200	
Dumarest Bros.	Colon	New York	1,200	
Fidanque Bros. & Sons..	Colon	New York	400	
Isaac Brandon & Bros...	Colon	New York	100	7,900
OCTOBER 14. By the S. S. *General W. G. Gorgas*, at New York.				
Pablo, Calvet & Co.....	Cristobal	New York	70,000	
G. Amsinck & Co., Inc..	Cristobal	New York	18,000	
A. M. Capen's Sons, Inc.	Cristobal	New York	13,000	
Ultramares Corp.	Cristobal	New York	6,200	
William Peck & Co.....	Cristobal	New York	4,500	
Mecke & Co............	Cristobal	New York	3,200	
W. R. Grace & Co......	Cristobal	New York	121,500	
Various	Cristobal	New York	1,400	237,800

[6]West Indian rubber.
[7]Transhipped at South Pacific.

AFRICANS.

	Shipment from	Shipped to	Pounds.	Totals.
SEPTEMBER 24. By the S. S. *Port Bowen*, at New York.				
Poel & Kelly...........	Liverpool	New York	65,130	76,230
Meyer & Brown, Inc...	Liverpool	New York	11,100	
OCTOBER 1. By the S. S. *Niagara*, at New York.				
Curry, McPhillips & Co.	Bordeaux	New York	36,295	
Various	Bordeaux	New York	424,235	460,530
OCTOBER 6. By the S. S. *Lancastrian*, at New York.				
Curry, McPhillips & Co.	Antwerp	New York	94,451	94,541
OCTOBER 10. By the S. S. *Wheaton*, at New York.				
Curry, McPhillips & Co.	Antwerp	New York	2,300	2,300
OCTOBER 11. By the S. S. *Victoria*, at New York.				
L. Littlejohn & Co., Inc.	Liverpool	New York	40,250	
General Rubber Co.....	Liverpool	New York	32,200	
Poel & Kelly...........	Liverpool	New York	25,710	
Rubber Trading Co.....	Liverpool	New York	11,200	109,360
OCTOBER 16. By the S. S. *Gothland*, at New York.				
Poel & Kelly...........	Antwerp	New York	6,900	6,900

PONTIANAK.

	Shipment from	Shipped to	Pounds.	Totals.
SEPTEMBER 19. By the S. S. *Toyama Maru*, at New York.				
Meyer Bros. & Co......	Singapore	Seattle	179,100	179,100
OCTOBER 1. By the S. S. *Western Cross*, at New York.				
Joosten & Jansen.......	Batavia	New York	3,000	3,000
OCTOBER 6. By the S. S. *Homestead*, at New York.				
United Malaysian Rubber Co.	Singapore	New York	356,283	
Paterson, Simmons & Co.	Singapore	New York	437,700	
Jaeger & Co., Limited...	Singapore	New York	237,600	
Stephano Berizzi & Co..	Singapore	New York	79,200	
Rubber Importers & Dealers' Co., Inc.........	Singapore	New York	45,600	1,156,333

	Shipment from:	Shipped to	Pounds.	Totals.
OCTOBER 14. By the S. S. *East Indian*, at New York.				
Hadden & Co...........	London	New York	59,700	59,700
OCTOBER 15. By the S. S. *Yseldijk*, at New York.				
United Malaysian Rubber Co., Ltd.........	Soerabaya	New York	538,247	
Various	Borneo	New York	20,953	559,200
OCTOBER 15. By the S. S. *Gaelic Prince*, from Philippine Islands, at New York.				
L. Littlejohn & Co.....	Singapore	New York	364,500	
Jaeger & Co., Limited...	Singapore	New York	135,000	
Innes & Co............	Singapore	New York	62,400	
Chas. T. Wilson Co., Inc.	Singapore	New York	6,600	
F. R. Henderson & Co..	Singapore	New York	300	568,800

BALATA.

	Shipment from	Shipped to	Pounds.	Totals.
SEPTEMBER 19. By the S. S. *Matura*, at New York.				
G. Amsinck & Co., Inc..	Trinidad	New York	10,695	
General Export & Commission Co.	Trinidad	New York	9,912	
Various	Trinidad	New York	31,165	51,772
SEPTEMBER 26. By the S. S. *Panama*, at New York.				
Isaac Brandon & Bros...	Cristobal	New York	4,800	
G. Amsinck & Co., Inc.	Cristobal	New York	900	
New York American Industries	Cristobal	New York	900	
Various	Cristobal	New York	3,150	9,750
OCTOBER 2. By the S. S. *Mayaro*, from Trinidad, at New York.				
Southern Sales Corporation	Ciudad Bolivar	New York	24,300	
G. Amsinck & Co., Inc..	Ciudad Bolivar	New York	16,950	
South & Central America Commercial Co..	Ciudad Bolivar	New York	10,925	
Middleton & Co........	Ciudad Bolivar	New York	6,150	
Mueller, Schall & Co...	Ciudad Bolivar	New York	3,600	61,925
OCTOBER 3. By the S. S. *Lakehurst*, at New York.				
W. Reed Williams, Inc.	Cristobal	New York	9,250	9,250
OCTOBER 5. By the S. S. *General O. H. Ernst*, at New York.				
Antioquia Commercial Corp.	Cristobal	New York	6,800	
Mecke & Co............	Cristobal	New York	3,000	
J. S. Sembrada & Co...	Cristobal	New York	750	10,550
OCTOBER 9. By the S. S. *Turrialba*, at New York.				
American Trading Co...	Kingston	New York	3,150	3,150
OCTOBER 10. Ex S. S. *Gauca*, from South Pacific, at New York.[5]				
Fromme & Co..........	Colon	New York	9,900	
Various	Colon	New York	6,450	16,350
OCTOBER 14. By the S. S. *Belgic*, at New York.				
Earle Bros.	Liverpool	New York	3,000	3,000

[5]Transhipped at South Pacific.

GUTTA PERCHA.

	Shipment from	Shipped to	Pounds.	Totals.
OCTOBER 6. By the S. S. *Homestead*, at New York.				
Jaeger & Co., Limited...	Singapore	New York	60,000	60,000
OCTOBER 15. By the S. S. *Yseldijk*, at New York.				
United Malaysian Rubber Co. Limited......	Borneo	New York	91,060	91,060

GUTTAS.

	Shipment from	Shipped to	Pounds.	Totals.
OCTOBER 15 By the S. S. *Gaelic Prince*, via P. I., at New York.				
L. Littlejohn & Co.....	Singapore	New York	187,500	187,500

GUAYULE.

	Shipment from	Shipped to	Pounds.	Totals.
SEPTEMBER 22. By the S. S. *Esperanza*, at New York.				
G. Amsinck & Co., Inc..	Vera Cruz	New York	13,500	13,500

UNITED STATES CRUDE RUBBER IMPORTS FOR 1919 (BY MONTHS).

1919.	Plantations.	Paras.	Africans.	Centrals.	Guayule.	Maniçoba and Matto Grosso.	Totals for 1919.	Totals for 1918.
January ... *tons*	4,906	2,141	2	114	72	...	7,235	16,084
February	14,079	2,701	489	100	87	...	17,456	13,108
March	23,680	3,808	337	211	187	...	28,223	17,161
April	24,678	2,794	90	144	330	110	28,146	13,425
May	14,856	772	389	97	234	...	16,348	16,288
June	13,645	1,706	264	263	390	51	16,319	24,124
July	17,645	121	16	82	101	...	17,965	16,092
August	8,221	2,594	137	74	41	...	11,067	10,421
September	10,143	3,423	312	51	11	96	14,036	5,353
Totals	131,853	20,060	2,036	1,136	1,453	257	156,095	132,056

(Compiled by The Rubber Association of America, Inc.)

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES, DURING THE MONTH OF AUGUST, 1919.

EXPORTED TO—	Belting Hose and Packing. Value.	Boots.		Shoes.		Druggists' Rubber Sundries. Value.	Tires		Insulated Wire and Cables. Value.	All Other Manufactures of Rubber. Value.	Totals. Value.
		Pairs.	Value.	Pairs.	Value.		Automobiles. Value.	All Others. Value.			
EUROPE:											
Austria-Hungary										$42,200	$42,200
Azores and Madeira Islands				222	$284						284
Belgium	$2,718					$657	$3,170		$17,027	3,001	26,573
Denmark	901			29,145	19,130	135	166,448	$5,040	4,031	50,768	246,453
France	4,857	7	$28				62,665			33,125	100,675
Greece	46						9,031			540	9,617
Italy	63	168	531	4,248	3,586	234	25		3,115	455	8,009
Malta, Gozo and Cyprus Islands										47	47
Netherlands	21,344			11,928	6,974	321	105,442	3,685	3,199	7,268	148,233
Norway	40,307	24	32	101,523	55,806	2,084	122,360	13,961	50,248	26,342	311,140
Portugal							51,126	6,000	2,030	114	59,270
Roumania							14,561				14,561
Russia in Europe										11	11
Spain	35	12	54	96	75	513	158,841		2,217	8,330	170,065
Sweden	13,955			372	219	3,117	31,876	2,750	10,950	3,559	66,426
Switzerland							7,490				7,490
Turkey in Europe				2,184	2,292				1,113		3,405
England	47,447	10,860	15,506	281,645	159,415	12,049	154,988		38,745	150,925	579,075
Scotland	2,570					301				931	3,802
Ireland										645	645
TOTALS, EUROPE	$134,243	11,071	$16,151	441,363	$249,751	$19,411	$888,023	$31,436	$132,075	$328,261	$1,797,981
NORTH AMERICA:											
Bermuda	$355			832	$941	$29	$163	$98	$183	$88	$1,857
British Honduras	143			906	944	27	575	4		142	1,835
Canada	20,062	3,978	$12,351	6,577	9,452	17,004	71,518	4,308	13,787	149,225	297,707
Costa Rica	1,227					57	254		74	41	1,653
Guatemala	244			60	66	829	5,239	955	1,276	1,534	10,143
Honduras	715					160	4,121			293	5,289
Nicaragua	1,461			225	162	63	2,620	114	299	671	5,390
Panama	6,288	66	370	1,722	1,980	61	21,345	478	1,940	1,576	34,038
Salvador	1,991					158	3,324		889	1,813	8,175
Mexico	37,580			4,988	4,489	10,830	57,354	5,427	21,755	20,935	158,370
Miquelon, Langley, etc.		221	820	2	4						824
Newfoundland and Labrador	12,734	12,257	37,804	18,573	17,322	63	2,395	222	5,391	5,125	81,056
Barbados	83	6	18	308	325	92	1,577		73	433	2,601
Jamaica	435			1,928	1,966	104	12,533	190	36	1,957	17,221
Trinidad and Tobago	818					281	3,474	311	265	251	5,400
Other British West Indies	1,061			544	438	94	3,112	82	520	432	5,739
Cuba	39,549			17,948	17,970	9,431	141,928	21,440	14,330	43,338	287,986
Danish West Indies	236			841	1,178		1,151	118	85	3	2,771
Dutch West Indies	18						1,427	25		6	1,476
French West Indies	1,452			1,074	834		6,712		17	495	9,510
Haiti	360					4	11,089	113	53	604	12,223
Dominican Republic	1,345			108	121	3,785	36,465	2,587	659	2,625	47,587
TOTALS, NORTH AMERICA	$128,157	16,528	$51,363	56,636	$58,192	$43,072	$388,376	$36,472	$61,632	$231,587	$988,851
SOUTH AMERICA:											
Argentina	$21,480			35,951	$29,056	$4,907	$210,527	$2,726	$105,322	$41,699	$415,717
Bolivia	6,535					422	1,862		377	320	9,516
Brazil	17,303	96	$525	12,075	9,647	5,007	94,196	3,196	52,886	26,034	208,794
Chile	9,644	74	522	2,826	3,009	3,943	44,089	87	18,283	4,314	83,891
Colombia	1,291			14	8	1,262	7,911	174	1,487	1,070	13,203
Ecuador	4,315					28	4,660		544	572	10,119
British Guiana	76						2,495	250	521	161	3,503
Dutch Guiana	356			120	78		514		27	168	1,143
Paraguay	118								238		356
Peru	3,472	24	300	973	1,098	1,791	16,686	339	7,932	3,520	35,138
Uruguay	1,531			144	95	3,610	117,866		7,564	11,067	141,733
Venezuela	2,514					317	13,882	220	4,163	1,533	22,629
TOTALS, SOUTH AMERICA	$68,635	194	$1,347	52,103	$42,991	$121,287	$514,688	$6,992	$199,344	$90,458	$945,742
ASIA:											
China	$1,538	2	$11	31,584	$34,262	$582	$11,155	$4,297	$72,170	$9,074	$133,089
Japanese China				2,164	1,815					140	1,955
Chosen				124	119					46	165
British India	4,397			950	788	1,328	30,948		60,761	3,107	101,329
Straits Settlements				240	142	48	95,298	8,797		1,636	105,921
Other British East Indies						105	1,937			265	2,307
Dutch East Indies	2,660			216	326	252	54,656	3,992	58,932	7,821	128,639
French East Indies	17								595	92	694
Hongkong	36			77	135	308	2,093		1,602	500	4,674
Japan	28,113	1,650	4,945	39,109	36,328	2,890	64,426		6,118	15,378	158,498
Persia							167				167
Russia in Asia	880			3	4	268	600			382	2,134
Siam	5					93	1,055				1,153
Turkey in Asia				2,496	7,578				134	410	8,122
TOTALS, ASIA	$37,946	1,652	$4,956	76,963	$81,497	$5,874	$262,335	$17,086	$200,312	$38,841	$648,847
OCEANIA:											
Australia	$11,372	576	$1,522			$2,845	$31,607	$3,511	$6,368	$5,827	$63,052
New Zealand	22,965	144	538	144	$336	1,116	110,662	472	2,295	17,321	155,705
Other British Oceania							256	74		294	624
French Oceania	134					3	967	235		353	1,692
German Oceania							1,794	74		141	2,009
Philippine Islands	50,152			21,637	26,444	1,780	86,089	11,222	75,843	62,590	314,120
TOTALS, OCEANIA	$84,623	720	$2,060	21,781	$26,780	$5,744	$231,375	$15,588	$84,506	$86,526	$537,202
AFRICA:											
British West Africa							$5,070			$652	$5,722
British South Africa	$62,027	716	$2,868	2,035	$1,850	$529	53,783		$62,132	11,489	194,678
British East Africa							585			3	588
French Africa							239				239
Portuguese Africa	2,473					21				16	2,510
Spanish Africa	206										206
Egypt				40	51		6,500	$2,999	842	1,344	11,826
TOTALS, AFRICA	$64,706	716	$2,868	2,075	$1,901	$550	$66,267	$2,999	$62,974	$13,504	$215,769
TOTALS	$518,310	30,881	$78,745	640,921	$459,142	$95,938	$2,351,064	$110,573	$741,443	$789,177	$5,144,392

SHIPMENTS TO NON-CONTIGUOUS TERRITORY.

	Belting Hose and Packing. Value	Boots and Shoes. Pairs.	Boots and Shoes. Value	Druggists' Rubber Sundries Value	Tires. Automobiles Value	Tires. All Others. Value.	Insulated Wire and Cables. Value.	All Other Manufactures of Rubber Value.	Totals. Value.
Hawaii	$8,284	787	$942	....	$80,186	$2,073	....	$7,709	$99,194
Porto Rico	4,819	10,645	7,136	....	87,704	667	....	16,528	116,854
Totals	$13,103	11,432	$8,078	....	$167,890	$2,740	....	$24,237	$216,048

(Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.)

Official India Rubber Statistics for the United States.

Calendar Year 1918.

INDIA RUBBER.

IMPORTS OF CRUDE INDIA RUBBER BY COUNTRIES (FREE).

From	Pounds.	Value.
Europe		
France	169,318	$72,406
Portugal	424,424	152,362
United Kingdom—		
England	6,627,165	3,723,993
Totals, Europe	7,220,907	$3,948,761
North America—		
Canada	2,712,336	$1,314,386
Central American States—		
Costa Rica	22,579	11,026
Guatemala	12,012	3,113
Honduras	7,376	3,236
Nicaragua	158,140	48,339
Panama	164,445	67,346
Salvador	22,592	9,973
Mexico	2,185,809	850,123
West Indies		
British—		
Trinidad and Tobago	51,246	30,618
Other British	434	216
Cuba	4,390	1,452
Totals, North America	5,341,359	$2,339,828
South America		
Argentina	390,734	$107,832
Bolivia	474,781	207,793
Brazil	40,332,620	13,378,588
Chile	1,246	560
Colombia	884,792	356,226
Ecuador	244,521	81,424
Guiana—		
British	47,561	37,540
Dutch	5,916	3,798
Peru	1,373,751	489,146
Uruguay	8,585	3,916
Venezuela	158,857	74,825
Totals, South America	43,921,364	$14,741,648
Asia—		
China	559,658	$180,307
China, leased territory—		
French	15,680	6,041
East Indies—		
British—		
British India	9,248,210	4,091,968
Straits Settlem'ts.	198,904,100	91,142,953
Other British	19,543,495	9,738,475
Dutch	37,344,813	18,204,689
Hongkong	562,717	294,381
Japan	2,529,395	1,346,494
Totals, Asia	268,710,068	$125,005,308
Oceania—		
Other British	622	$378
Philippine Islands	666,102	311,737
Totals, Oceania	666,724	$312,115
Africa		
British West Africa	76,264	$19,446
Portuguese Africa	22,622	11,207
Totals, Africa	98,886	$30,653
Calendar year, 1918	325,959,308	146,378,313
Fiscal year, 1917-18	389,599,015	202,800,392
Fiscal year, 1916-17	333,373,711	189,328,674
Fiscal year, 1915-16	267,775,557	155,044,790
Fiscal year, 1914-15	172,068,428	83,030,269
Fiscal year, 1913-14	131,995,742	71,219,851
Fiscal year, 1912-13	113,384,359	90,170,316
Fiscal year, 1911-12	110,210,173	93,013,255
Fiscal year, 1910-11	72,046,260	76,244,603
Fiscal year, 1909-10	101,044,681	101,078,825
Fiscal year, 1908-09	88,359,895	61,709,723
Fiscal year, 1907-08	62,233,160	36,613,185
Fiscal year, 1906-07	76,963,838	58,919,981
Fiscal year, 1905-06	57,844,345	45,114,450

IMPORTS OF CRUDE INDIA RUBBER BY CUSTOMS DISTRICTS (FREE).

At	Pounds.	Value.
Massachusetts	10,222,733	$3,671,477
New York	119,664,398	49,381,919
Philadelphia	31,480	11,496
New Orleans	10,650	3,234
San Antonio	808,372	302,187
San Francisco	53,063,123	28,445,675
Southern California	78,345	37,034
Washington	109,557,617	51,099,147
Buffalo	693,490	319,270
Chicago	1,297,791	648,524
Dakota	6,008,636	2,771,712
Michigan	336,194	150,439
Ohio	19,157,829	7,424,035
St Lawrence	487,934	269,357
Vermont	4,095,971	1,630,230
Minnesota	299,568	149,784
Omaha	48,445	26,644
Pittsburgh	96,732	36,149
Calendar year, 1918	325,959,308	$146,378,313

IMPORTS OF MANUFACTURES OF INDIA RUBBER AND GUTTA PERCHA BY COUNTRIES (DUTIABLE).

[+ indicates increase; — indicates decrease, compared with preceding year.]

From—	Value.
Europe—	
France	$4,285+
Italy	487
Spain	665—
Switzerland	2,564+
United Kingdom	
England	216,425—
Scotland	26,936+
Ireland	1,659+
Total, Europe	$253,021
North America—	
Canada	$167,682—
Mexico	265+
Total, North America	$167,947
South America—	
Colombia	$2,900
Asia	
Japan	21,441—
Oceania—	
British New Zealand	23+
Totals, Calendar year, 1918	$445,332

	Gutta Percha.	India Rubber.
Fiscal year, 1917-18	$16,978	$599,763
Fiscal, year, 1916-17	173,975	608,954
Fiscal year, 1915-16	57,875	398,020
Fiscal year, 1914-15	10.841	791,281
Fiscal year, 1913-14	42,023	1,517,789
Fiscal year, 1912-13	77,300	1,217,236
Fiscal year, 1911-12	41,098	874,736
Fiscal year, 1910-11	61,283	875,125
Fiscal year, 1909-10	80,567	1,154,347
Fiscal year, 1902-09	71,819	1,391,779
Fiscal year, 1907-08	93,545	1,956,590

IMPORTS OF INDIA RUBBER AND GUTTA PERCHA BY CUSTOMS DISTRICTS (DUTIABLE).

At—	Value.
Maine and New Hampshire	$748
Maryland	7,323
Massachusetts	19.579
New York	374,593
Philadelphia	794
Porto Rico	292
Rhode Island	741
Alaska	2
Hawaii	2,136
Oregon	3
San Francisco	1,549
Southern California	144
Washington	1,295
Buffalo	2,580
Chicago	3,504
Dakota	59
Duluth and Superior	7
Michigan	11,015
Montana and Idaho	128
Ohio	5,518
Rochester	23
St. Lawrence	203
Vermont	185
Wisconsin	9,193
Omaha	400
Pittsburgh	3,316
St. Louis	2
Calendar year, 1918	$445,332

REEXPORTS OF IMPORTED CRUDE INDIA RUBBER.

To—	Pounds.	Value.
United Kingdom—		
England	123,395	$72,920
Canada	5,568,816	2,794,008
Mexico	12	10
West Indies—		
Cuba	229,790	120,996
Chile	1,617	1,230
British Oceania—		
Australia	227,125	144,458
Calendar year, 1918	6,150,755	$3,133,622
Fiscal year, 1917-18	8,208,280	4,274,543
Fiscal year, 1916-17	12,355,898	7,304,820
Fiscal year, 1915-16	4,662,889	2,661,331
Fiscal year, 1914-15	6,383,145	3,361,107
Fiscal year, 1913-14	3,747,749	2,398,150
Fiscal year, 1912-13	5,272,387	4,476,379
Fiscal year, 1911-12	5,610,951	4,890,905
Fiscal year, 1910-11	5,267,588	5,439,282
Fiscal year, 1909-10	6,492,947	7,629,380
Fiscal year, 1908-09	3,791,971	2,964,496
Fiscal year, 1907-08	4,110,667	2,994,208
Fiscal year, 1906-07	4,215,350	3,593,912

REEXPORTS OF MANUFACTURES OF INDIA RUBBER AND GUTTA PERCHA.

To—	Value.
United Kingdom—England	$2,018
Canada	36,024
Central American States—Nicaragua	19
Mexico	33
West Indies—Cuba	586
Argentina	383
Venezuela	84
British Oceania—New Zealand	954
Calendar year, 1918	$40,101

	Gutta Percha.	India Rubber.
Fiscal year, 1917-18	$18,216	$13,563
Fiscal year, 1916-17	421	10,905
Fiscal year, 1915-16	537	38,649
Fiscal year, 1914-15	....	7,489
Fiscal year, 1913-14	....	7,638
Fiscal year, 1912-13	....	7,973
Fiscal year, 1911-12	65	6,681
Fiscal year, 1910-11	8,687	29,356
Fiscal year, 1909-10	....	13,568
Fiscal year, 1908-09	....	36,401
Fiscal year, 1907-08	....	176,129
Fiscal year, 1906-07	....	32,712

GUTTA PERCHA.

IMPORTS OF CRUDE GUTTA PERCHA BY COUNTRIES (FREE).

From	Pounds.	Value.
Europe—		
United Kingdom—		
England	22,791	$6,[illegible]39
Totals, Europe	22,791	$6,[illegible]39

GUTTA PERCHA—Continued.

	Pounds.	Value.
Asia—		
East Indies—		
British—Straits Settlements	354,794	$108,718
Dutch	306,241	18,632
Totals, Asia	661,035	$127,350
Africa—		
British Africa—		
West	22,400	$7,392
South	501,760	84,941
Totals, Africa	524,160	$92,333
Calendar year, 1918	1,207,986	$225,922
Fiscal year, 1917-18	1,151,312	147,323
Fiscal year, 1916-17	2,021,794	332,223
Fiscal year, 1915-16	3,188,449	342,226
Fiscal year, 1914-15	1,618,214	230,750
Fiscal year, 1913-14	1,846,109	323,567
Fiscal year, 1912-13	480,853	167,313
Fiscal year, 1911-12	1,204,406	225,797
Fiscal year, 1910-11	1,648,921	390,548
Fiscal year, 1909-10	784,501	167,873
Fiscal year, 1908-09	255,559	82,136
Fiscal year, 1907-08	188,610	100,305
Fiscal year, 1906-07	546,890	201,339
Fiscal year, 1905-06	500,770	188,161

IMPORTS OF CRUDE GUTTA PERCHA BY CUSTOMS DISTRICTS (FREE).

At—	Pounds.	Value
New York	470,477	$57,553
New Orleans	501,760	84,941
San Francisco	7,053	430
Washington	228,696	82,998
Calendar year, 1918	1,207,986	$225,922

REEXPORTS OF CRUDE GUTTA PERCHA.

To—	Pounds.	Value.
England	126,731	$29,015
Calendar year, 1918	126,731	$29,015
Fiscal year, 1917-18	202,646	47,211
Fiscal year 1916-17	763	558
Fiscal year, 1915-16	60,023	11,446
Fiscal year, 1914-15	9,457	4,603
Fiscal year, 1913-14	14,649	5,255
Fiscal year, 1912-13	22,352	2,665
Fiscal year, 1911-12	1,011	945
Fiscal year, 1910-11	62,391	19,235
Fiscal year, 1909-10	74,137	13,886
Fical year, 1908-09	9,370	3,730
Fiscal year, 1907-08	....	....
Fiscal year, 1906-07	5,000	700

GUAYULE.

IMPORTS OF GUAYULE BY COUNTRIES (FREE).

From—	Pounds.	Value.
North America		
Mexico	1,371,385	$411,322
South America		
Colombia	4,700	2,162
Calendar year, 1918	1,376,085	$413,484
Fiscal year, 1917-18	4,307,539	1,341,095
Fiscal year, 1916-17	2,854,372	764,484
Fiscal year, 1915-16	2,816,068	880,813
Fiscal year, 1914-15	5,111,849	1,441,367
Fiscal year, 1913-14	1,475,804	607,076
Fiscal year, 1912-13	10,218,191	4,345,088
Fiscal year, 1911-12	14,238,625	6,463,787
Fiscal year, 1910-11	19,749,522	10,443,157

IMPORTS OF GUAYULE BY CUSTOMS DISTRICTS (FREE).

At—	Pounds.	Value.
New York	4,700	$2,162
El Paso	47,950	8,631
San Antonio	1,323,435	402,691
Calendar year, 1918	1,376,085	$413,484

REEXPORTS OF GUAYULE.

To—	Pounds.	Value.
Canada	9,778	$2,936
Calendar year, 1918	9,778	$2,936

JELUTONG.

(PONTIANAK.)

IMPORTS OF JELUTONG BY COUNTRIES (FREE).

From—	Pounds.	Value.
Europe—		
England	2,675	$113
Totals, Europe	2,675	$113
North America—		
Canada	4,051	$284
Totals, North America	4,051	$284
South America		
Colombia	16,825	$4,238
Totals, South America.	16,825	$4,238
Asia—		
East Indies—		
British—		
Straits Settlem'ts.	6,779,262	$522,345
Other British	28,000	2,800
Dutch	3,099,282	153,479
Japan	2,381	292
Totals, Asia	9,808,925	$678,916
Calendar year, 1918	9,932,476	$683,551
Fiscal year, 1917-18	7,481,292	474,366
Fiscal year, 1916-17	....	....
Fiscal year, 1915-16	27,858,335	1,322,262
Fiscal year, 1914-15	14,851,264	731,995
Fiscal year, 1913-14	24,926,571	1,155,402
Fiscal year, 1912-13	45,345,338	2,174,441
Fiscal year, 1911-12	48,795,268	2,255,050
Fiscal year, 1910-11	51,420,872	2,872,633
Fiscal year, 1909-10	52,392,444	2,419,223
Fiscal year, 1908-09	24,826,296	852,372
Fiscal year, 1907-08	22,803,303	1,039,776
Fiscal year, 1906-07	28,437,660	1,085,098

IMPORTS OF JELUTONG BY CUSTOMS DISTRICTS (FREE).

At—	Pounds.	Value
New York	6,983,863	$482,525
San Francisco	1,353,171	99,082
Washington	1,579,896	100,240
Vermont	15,546	1,704
Calendar year, 1918	9,932,476	$683,551

IMPORTS OF JELUTONG (DUTIABLE).

	Pounds.	Value.
Fiscal year 1917-18	9,994,572	$501,450
Fiscal year 1916-17	23,376,389	1,044,022

REEXPORTS OF JELUTONG.

To	Pounds.	Value.
Canada	73,868	$9,756

BALATA.

IMPORTS OF BALATA BY COUNTRIES (FREE).

From—	Pounds.	Value.
North America—		
Central American States—		
Panama	535,065	$224,348
West Indies—		
British—		
Trin. and Tobago	53,883	34,588
Dutch	32,814	23,991
Totals, North America	621,762	$282,927
South America		
Brazil	7,619	$5,301
Colombia	316,520	136 058
Ecuador	2,000	920
Guiana—		
British	218,868	180,308
Dutch	120,078	89,364
Venezuela	260,491	141,505
Totals, South America	925,576	$553,456
Calendar year, 1918	1,547,338	$836,383
Fiscal year, 1917-18	2,449,881	1,278,610
Fiscal year, 1916-17	3,287,445	1,649,452
Fiscal year, 1915-16	2,544,405	996,102
Fiscal year, 1914-15	2,472,224	963,384
Fiscal year, 1913-14	1,533,024	793,126
Fiscal year, 1912-13	1,318,598	766,772
Fiscal year 1911-12	1,517,066	984,012
Fiscal year, 1910-11	878,305	624,702
Fiscal year, 1909-10	399,003	196,878
Fiscal year, 1908-09	1,157,018	522,872
Fiscal year, 1907-08	584,582	276,756
Fiscal year, 1906-07	799,029	305,041
Fiscal year, 1905-06	374,220	152,689

IMPORTS OF BALATA BY CUSTOMS DISTRICTS (FREE).

At—	Pounds.	Value.
New York	1,547,338	$836,383

REEXPORTS OF BALATA.

To	Pounds.	Value.
Europe		
Greece	5,000	$4,625
United Kingdom—		
England	637,822	$384,820
Scotland	10,080	5,350
Totals, Europe	652,902	$394,795
North America—		
Canada	9,639	5,443
Asia—		
Japan	43,644	36,014
Calendar year, 1918	706,185	$436,252
Fiscal year, 1917-18	473,915	$303,338
Fiscal year, 1916-17	879,765	474,538
Fiscal year, 1915-16	667,168	245,329
Fiscal year, 1914-15	1,076,619	426,735
Fiscal year 1913-14	223,983	127,139
Fiscal year, 1912-13	118,334	77,963
Fiscal year, 1911-12	62,529	38,423
Fiscal year, 1910-11	264,589	235,575
Fiscal year 1909-10	....	42,750
Fiscal year, 1908-09	....	223,907
Fiscal year, 1907-08	....	18,741
Fiscal year, 1906-07	....	12,659

RECLAIMED RUBBER.

EXPORTS OF RECLAIMED RUBBER BY COUNTRIES.

To—	Pounds.	Value.
Europe—		
France	137,519	$20,061
Italy	143,000	33,319
Totals, Europe	280,519	$53,380
North America—		
Canada	2,591,012	$441,492
Honduras	5	1
Cuba	20,663	4,917
Totals, North America	2,611,680	$446,410
Asia—		
Straits Settlements	11,200	$2,268
Japan	35	10
Totals, Asia	11,235	$2,278
Africa—		
South Africa	800	$108
Totals, Africa	800	$108
Calendar year, 1918	2,904,234	$502,176
Fiscal year, 1917-18	3,284,958	$567,278
Fiscal year, 1916-17	4,938,991	814,199
Fiscal year, 1915-16	6,406,946	871,262
Fiscal year, 1914-15	5,970,380	822,561
Fiscal year, 1913-14	5,583,860	834,440
Fiscal year, 1912-13	5,413,247	932,904
Fiscal year, 1911-12	5,397,806	875,501
Fiscal year, 1910-11	4,994,527	781,650
Fiscal year, 1909-10	3,622,556	535,795
Fiscal year, 1908-09	3,196,551	414,861
Fiscal year, 1907-08	2,947,974	418,738
Fiscal year, 1906-07	4,550,788	665,109
Fiscal year, 1905-06	4,084,696	511,843
Fiscal year, 1904-05	*a*	522,902

(*a*) Not officially reported.

EXPORTS OF RECLAIMED RUBBER BY CUSTOMS DISTRICTS.

At—	Pounds.	Value.
New York	313,182	$60,673
New Orleans	5	1
San Francisco	35	10
Buffalo	1,638,462	291,065
Dakota	2,300	376
Michigan	17,036	1,859
St. Lawrence	200,573	34,745
Vermont	732,641	113,447
Calendar year, 1918	2,904,234	$502,176

SUBSTITUTES, ELASTICON, ETC.

IMPORTS OF ELASTICON AND SIMILAR SUBSTITUTES FOR INDIA RUBBER BY COUNTRIES (DUTIABLE).

From—	Value.
Europe	
United Kingdom—	
England	$4,623
Totals, Europe	$4,623
Asia—	
East Indies—	
British—	
Straits Settlements	326,474
Dutch	52,400
Total, Asia	$378,874
Calendar year, 1918	$383,497
Fiscal year, 1917-18	136,438
Fiscal year, 1916-17	39,815
Fiscal year, 1915-16	16,179
Fiscal year, 1914-15	30,349
Fiscal year, 1913-14	87,642
Fiscal year, 1912-13	97,452
Fiscal year, 1911-12	87,328
Fiscal year, 1910-11	115,601
Fiscal year, 1909-10	114,516
Fiscal year, 1908-09	60,625
Fiscal year, 1907-08	27,000

IMPORTS OF ELASTICON AND SIMILAR SUBSTITUTES OF INDIA RUBBER BY CUSTOMS DITRICTS (DUTIABLE).

At—	Value.
Massachusetts	$4,623
New York	265,480
San Francisco	35,008
Washington	78,386
Calendar year, 1918	$383,497

REEXPORTS OF ELASTICON AND SIMILAR SUBSTITUTES OF INDIA RUBBER BY COUNTRIES.

From—	Value.
United Kingdom—	
Scotland	$9,463
Canada	10,891
Japan	45,360
French Oceania	51
Calendar year, 1918	$65,765
Fiscal year, 1917-18	11,098

SCRAP RUBBER.

IMPORTS OF SCRAP RUBBER BY COUNTRIES (FREE).

To—	Pounds.	Value.
Europe—		
France	780,347	$77,324
Italy	242,376	62,760
United Kingdom—		
England	4,741,202	378,320
Totals, Europe	5,763,925	$518,404

SCRAP RUBBER—Continued.

North America—		
Canada	1,390,235	$76,940
Central American States—		
Costa Rica	200	14
Panama	53,439	2,908
Mexico	88,514	3,032
Newfoundland and Labrador	64,205	4,984
West Indies—		
British—		
Jamaica	1,912	118
Trinidad and Tabago	6,543	361
Other British	794	109
Cuba	585,435	28,402
Dominican Republic	468	23
Haiti	150	20
Totals, North America	2,191,895	$116,911
South America—		
Brazil	473,196	$6,675
Colombia	3,428	101
Venezuela	635	194
Totals, South America	477,259	$6,970
Oceania—		
British—		
Australia	10,000	$500
New Zealand	83,341	2,796
Totals, Oceania	93,341	$3,296
Calendar year, 1918...	8,526,420	$645,581
Fiscal year, 1917-18...	13,980,303	1,019,222
Fiscal year, 1916-17...	20,517,328	1,569,448
Fiscal year, 1915-16...	16,371,573	1,271,903
Fiscal year, 1914-15...	11,006,928	726,914
Fiscal year, 1913-14...	25,958,261	2,063,198
Fiscal year, 1912-13...	43,385,456	3,709,238
Fiscal year, 1911-12...	26,293,192	2,095,605
Fiscal year, 1910-11...	26,948,000	2,334,870
Fiscal year, 1909-10...	37,364,671	2,998,697
Fiscal year, 1908-09...	20,497,695	1,543,267
Fiscal year, 1907-08...	16,331,035	1,496,822
Fiscal year, 1906-07...	29,335,193	2,607,987

IMPORTS OF SCRAP RUBBER BY CUSTOMS DISTRICTS (FREE).

At—	Pounds	Value.
Maine and New Hampshire	224,275	$21,454
Maryland	203,961	33,630
Massachusetts	56,087	1,611
New York	6,742,948	529,933
Galveston	54,300	1,531
San Francisco	93,341	3,296
Southern California	100	5
Washington	202,656	10,501
Buffalo	296,637	19,921
Chicago	30,491	2,534
Michigan	194,357	3,763
Ohio	47,057	2,843
St Lawrence	220,435	9,954
Vermont	159,775	4,605
Calendar year, 1918...	8,526,420	$645,581

EXPORTS OF SCRAP RUBBER BY COUNTRIES.

To—	Pounds.	Value.
Europe—		
Totals, Europe	8,041	$4,452
France	8,041	$4,452
North America		
Canada	2,923,570	$283,392
Mexico	318	39
Totals, North America	2,923,888	$283,431
Calendar year, 1918...	2,931,929	$287,883
Fiscal year, 1917-18...	2,117,257	235,811
Fiscal year, 1916-17...	3,696,661	415,526
Fiscal year, 1915-16...	3,904,715	400,148
Fiscal year, 1914-15...	2,422,091	291,421
Fiscal year, 1913-14...	6,207,672	598,287
Fiscal year, 1912-13...	7,269,465	880,442
Fiscal year, 1911-12...	7,336,984	780,188
Fiscal year, 1910-11...	7,049,729	723,664
Fiscal year, 1909-10...	6,143,610	578,944
Fiscal year, 1908-09...	4,071,795	402,897
Fiscal year, 1907-08...	4,255,789	449,727
Fiscal year, 1906-07...	4,756,621	548,695

EXPORTS OF SCRAP RUBBER BY CUSTOMS DISTRICTS.

At—	Pounds	Value.
Maine and New Hampshire	2,285	$224
Massachusetts	8,041	4,452
New York	178	27
San Antonio	100	2
Southern California	40	10
Buffalo	1,330,459	170,410
Dakota	3,675	300
Michigan	430,055	29,307
St. Lawrence	841,607	63,411
Vermont	315,489	19,680
Totals	2,931,929	$287,883

REEXPORTS OF SCRAP RUBBER.

To—	Pounds.	Value.
Canada	58,574	$16,032
Calendar year 1918...	58,574	$16,032
Fiscal year, 1917-18...	74,497	$16,965
Fiscal year, 1916-17...	1,626	215
Fiscal year, 1915-16...	9,204	734
Fiscal year, 1914-15...	3,483	373
Fiscal year, 1913-14...	24,295	2,450
Fiscal year, 1912-13...	87,930	10,723
Fiscal year, 1911-12...	302,105	28,196
Fiscal year, 1910-11...	401,231	43,338
Fiscal year, 1909-10...	61,395	5,373
Fiscal year, 1908-09...	38,506	2,093
Fiscal year, 1907-08...	21,713	2,943
Fiscal year, 1906-07...	105,463	9,444

Note.—Details of exports of domestic merchandise by countries for the calendar year 1918, were given on pages 736, 737 of The India Rubber World, September 1, 1919.

EXPORTS OF UNITED STATES RUBBER GOODS, CALENDAR YEAR 1918. (BY CUSTOMS DISTRICTS.*)

From—	Belting, Hose, and Packing. Value	Boots Pairs.	Boots Value	Shoes Pairs.	Shoes Value.	Druggists' Rubber Sundries. Value.	Tires. Automobile Value.	Tires. All Other. Value.	All Other Manufactures of Rubber. Value.	Totals. Value.
Maine and New Hampshire	$40,791	16,392	$57,906	23,284	$23,596	$1,718	$100,324	$1,055	$48,712	$274,102
Maryland	7,321	......	......	......	......	469	71,114	......	21,699	100,603
Massachusetts	7,059	147,988	538,091	95,931	97,571	36,233	1,110	23	138,691	818,778
New York	2,324,029	547,703	2,009,169	461,539	424,945	408,215	7,383,784	394,062	2,994,757	15,938,961
Philadelphia	11,581	......	......	......	......	795	3,070	......	711	16,157
Virginia	......	......	......	......	......	......	588	......	......	588
Porto Rico	590	......	......	552	672	2,086	7,007	1,000	3,829	15,184
Florida	10,929	......	......	10	12	2	447,409	31,778	32,149	522,279
Galveston	302	......	......	......	......	......	120	......	855	1,277
Mobile	1,733	923	769	1,827	1,347	180	13,033	13,106	4,908	35,076
New Orleans	53,164	252	634	77,666	67,208	7,914	74,281	15,920	9,755	228,876
Sabine	17,026	......	......	......	......	288	4,403	5	986	22,708
Arizona	72,394	71	350	10,226	9,799	2,001	120,852	2,350	11,285	219,031
El Paso	34,618	6	13	1,388	1,056	2,123	26,629	815	8,417	73,671
San Antonio	145,471	64	398	2543	2,127	10,294	455,401	15,547	26,916	656,154
Alaska	233	666	2,630	385	743	......	519	......	310	4,435
Hawaii	3	......	......	45	25	4	705	82	214	1,033
San Francisco	987,009	5,401	15,687	174,021	136,784	44,597	3,371,767	154,699	607,959	5,318,502
Southern California	1,965	17	99	559	559	2,215	7,157	68	2,097	14,160
Washington	262,221	6,390	20,748	39,121	40,746	13,125	569,827	33,669	127,911	1,068,247
Buffalo	149,156	1,307	5,112	9,278	9,003	71,902	119,881	31,586	383,209	769,849
Dakota	157,420	7,746	27,586	71,036	55,063	41,748	502,987	26,176	179,204	990,184
Duluth and Superior	12,192	340	781	3,555	5,976	5,492	100,172	730	20,023	145,357
Michigan	56,841	34,000	105,885	8,322	6,953	26,989	348,812	11,226	163,940	720,646
Montana and Idaho	2,115	......	......	60	110	939	5,641	......	969	9,774
Ohio	181	......	......	......	......	......	......	......	392	573
Rochester	......	......	......	......	......	......	......	......	69	69
St. Lawrence	116,079	1,638	7,528	951	809	12,569	651,228	15,468	337,772	1,141,453
Vermont	52,820	1,682	5,730	302,811	699,652	80,641	123,800	6,523	634,340	1,603,506
‖Calendar year 1918...	$4,525,243	772,586	$2,799,116	1,285,110	$1,584,747	$772,539	$14,511,621	$755,888	$5,762,079	$30,711,233
Fiscal year, 1917-18...	$4,578,396	1,559,598	$4,861,213	1,244,170	913,128	884,245§	13,977,671	1,130,623	6,194,816	32,540,092
Fiscal year, 1916-17...	3,532,383	600,455	1,483,379	3,356,484	1,716,225	......	12,330,201	2,547,652	8,265,509	29,875,349
Fiscal year, 1915-16...	2,986,953	720,130	1,619,260	1,976,896	1,046,102	......	17,936,227	3,003,077	7,290,345	33,881,964
Fiscal year, 1914-15...	1,807,848	318,727	726,765	2,219,900	2,053,560	......	4,963,270	576,602	3,525,486	13,653,531
Fiscal year, 1913-14...	2,372,887	101,361	279,206	1,634,258	834,289	......	3,505,267	563,372	3,453,472	11,008,493
Fiscal year, 1912-13...	2,605,551	109,528	274,330	2,231,467	1,163,953	......	3,943,220	611,458	3,913,036	12,511,548
			Boots and Shoes.† Pairs.	Boots and Shoes.† Value.						
Fiscal year, 1911-12...	$2,315,484	......	2,545,076	$1,502,890	......	......	$2,657,809	$546,833	$4,144,273	$11,167,289
Fiscal year, 1910-11...	2,163,416	......	3,984,332	2,219,430	......	......	2,085,107‡	592,470	3,886,825	10,947,248
Fiscal year, 1909-10...	1,960,825	......	3,791,084	1,984,739	......	......	......	......	5,115,331	9,060,895
Fiscal year, 1908-09...	1,498,445	......	2,396,435	1,292,673	......	......	......	......	3,823,956	6,615,074
Fiscal year, 1907-08...	1,347,775	......	3,080,253	1,614,290	......	......	......	......	3,743,040	6,705,105
Fiscal year, 1906-07...	1,253,369	......	2,310,420	1,231,898	......	......	......	......	3,729,643	6,214,910
Fiscal year, 1905-06...	1,221,159	......	2,693,690	1,505,082	......	......	......	......	2,966,144	5,692,385
Fiscal year, 1904-05...	994,100	......	2,390,539	1,214,342	......	......	......	......	2,572,375	4,780,817
Fiscal year, 1903-04...	880,010	......	2,310,420	1,231,898	......	......	......	......	3,729,643	6,214,910
Fiscal year, 1902-03...	819,985	......	2,307,401	1,056,491	......	......	......	......	2,299,875	4,176,351
Fiscal year, 1901-02...	634,146	......	2,594,708	1,046,315	......	......	......	......	1,781,941	3,462,402
Fiscal year, 1900-01...	565,726	......	1,459,100	724,015	......	......	......	......	1,727,527	3,017,268

*Exports of United States rubber goods, calendar year 1918, by countries, was published in The India Rubber World, September 1, 1919, page 737.

†States separately after 1912. ‡Tires were not specifically reported before 1910-11. §Druggists' rubber sundries were not specifically reported before 1917-18. ‖These figures are given for the calendar year ended December 31, 1918.

UNITED KINGDOM RUBBER STATISTICS.

IMPORTS.

	August.			
	1918.		1919.	
UNMANUFACTURED—	Pounds.	Value.	Pounds.	Value.
Crude rubber:				
From				
Dutch East Indies	173,300	£18,699	1,156,900	£111,293
French West Africa	17,900	2,630	....	....
Gold Coast	83,800	7,166	12,200	1,174
Other African countries	14,300	1,203	54,900	4,984
Peru	......	....	70,200	6,973
Brazil	....	....	677,300	73,257
British India	52,200	5,573	716,200	69,045
Straits Settlements and dependencies, including Labuan	1,463,900	165,413	4,595,700	460,442
Federated Malay States	584,600	58,704	2,779,800	260,110
Ceylon and dependencies	2,580,200	297,652	1,054,300	104,060
Other countries	221,300	25,833	354,600	33,760
Totals	5,191,500	£582,873	11,472,100	£1,125,098
Waste and reclaimed rubber	1,000	£23	253,200	£6,989
Totals, unmanufactured	5,192,500	£582,896	11,725,300	£1,132,087
Gutta percha	....	....	....	....
MANUFACTURED—				
Boots and shoes...*dozen pairs*	7,420	£15,339	32,904	£52,474
Waterproofed clothing	....	....	....	1,392
Automobile tires and tubes	....	14,568	....	239,952
Motorcycles tires and tubes	....	2,349	....	1,246
Bicycle tires and tubes	....	926	....	7,485
Carriage tires and tubes	....	....	....	2,999
Insulated wire	....	....	....	901
Totals	7,420	£33,177	32,904	£312,449

EXPORTS.

	1918.		1919.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED—				
Waste and reclaimed rubber	720,200	£21,158	1,066,800	£24,074
MANUFACTURED—				
Waterproof clothing	....	29,031	....	213,245
Boots and shoes...*dozen pairs*	5,417	6,987	16,608	34,442
Insulated wire	....	8,654	....	102,511
Submarine cables	....	34,225	....	73,983
Carriage tires and tubes	....	9,827	....	19,911
Automobile tires and tubes	....	58,221	....	252,150
Motorcycle tires and tubes	....	13,470	....	25,130
Bicycle tires and tubes	....	31,255	....	181,037
Other rubber manufactures	... ...	118,951	....	272,410
Totals	725,617	£331,779	1,103,408	£1,198,893

EXPORTS—COLONIAL AND FOREIGN.

	1918.		1919.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED—				
Crude rubber:				
To Belgium	....	....	2,506,500	£189,465
France	1,569,400	£169,936	2,070,900	195,419
Italy	721 200	78,315	1,511,800	164,033
Russia	....	....	....	....
United States	44,500	5,165	771,700	65,227
Other countries	272,900	27,746	4,107,500	401,886
Totals	2,608,000	£281,162	10,968,400	£1,016,030
Waste and reclaimed rubber	....	......	45,000	2,022
Gutta percha	900	223	90,500	16,592
MANUFACTURED—				
Boots and shoes...*dozen pairs*	1	£12	643	£1,462
Insulated wire	...	....	....	42
Automobile tires and tubes	....	5,978	....	7,798
Motorcycle tires and tubes	....	......	....	161
Bicycle tires and tubes	....	4,535	....	84
Carriage tires and tubes	....	....	....	371
Totals	1	£10,525	643	£9,918

RUBBER STATISTICS FOR THE DOMINION OF CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	July.			
	1918.		1919.	
UNMANUFACTURED—*free*	Pounds.	Value.	Pounds.	Value.
Rubber, gutta percha, etc.:				
From United Kingdom	86,874	$38,450	242,991	$108,856
United States	436,362	198,176	579,034	226,144
British East Indies:				
Ceylon	92,543	46,119	......	......
Straits Settlements	1,234,282	476,765	1,195,633	520,046
Other countries	5,980	3,514	......	......
Totals	1,856,041	$763,024	2,017,658	$855,046
Rubber, recovered	191,277	$33,065	492,265	$72,995
Hard rubber sheets and rods	825	867	14,375	5,547
Hard rubber tubes	......	14,231	......	1,995
Rubber, powdered, and rubber or gutta percha scrap	411,918	31,486	24,305	856
Rubber thread, not covered	2,588	3,822	3,253	4,553
Rubber substitute	91,381	19,384	26,437	4,315
Totals	697,989	$102,855	560,635	$89,461
Chicle	49,018	$34,075	109,955	$75,452
MANUFACTURED—*dutiable*				
Boots and shoes	......	$15,176	......	$12,696
Waterproofed clothing	......	20,002	......	19,004
Belting, hose and packing	......	39,105	......	36,823
Gloves and hot-water bottles	......	(1)	......	2,708
Tires	......	101,499	......	162,652
Other manufactures	......	161,585	......	69,506
Totals	......	$337,367	......	$303,389

[1] Included in "Other manufactures."

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	1918.		1919.	
	Produce of Canada.	Reexports of Foreign Goods.	Produce of Canada.	Reexports of Foreign Goods.
UNMANUFACTURED—	Value.	Value.	Value.	Value.
Crude and waste rubber	......	......	......	$191
Waste	$2,385	......	37,790	......
MANUFACTURED—				
Hose	24,103	......	7,823	......
Boots and shoes	37,321	437	169,462	222
Clothing	3,659	6,315	538	186
Tires	73,089	3,596	666,805	8,824
Belting	9	......	2,085	......
All other—n. o. p.	9,384	4,974	18,930	1,631
Total	$149,950	$15,322	$903,433	$11,054
Chicle	$85,849	......	$73,484	......

THE MARKET FOR RUBBER SCRAP.

NEW YORK.

THERE has been hardly any change in the rubber scrap market since a month ago. Manufacturers have been buying in small lots, the interest being centered around boots and shoes and standard auto tires.

Price changes in the list since last month show a quarter of a cent advance in boots and shoes, a decline of one cent in standard white auto tires and three-eighths in solid truck tires, otherwise the list is unchanged.

QUOTATIONS FOR CARLOAD LOTS DELIVERED.

OCTOBER 25, 1919.

Prices subject to change without notice.

BOOTS AND SHOES:				
Arctic tops	*lb.*	.01	@	
Boots and shoes	*lb.*	.08⅜	@	.08½
Trimmed arctics	*lb.*	.06½	@	.06⅝
Untrimmed arctics	*lb.*	.05⅝	@	
HARD RUBBER:				
Battery jars, black compound	*lb.*	.01	@	
No. 1, bright fracture	*lb.*	.23	@	.24
INNER TUBES:				
No. 1, old packing	*lb.*	.19	@	.20
No. 2	*lb.*	.10¾	@	.10¾
Red	*lb.*	.10	@	.10½
MECHANICALS:				
Black scrap, mixed, No. 1	*lb.*	.03½	@	.04
No. 2	*lb.*	.03	@	
Car springs	*lb.*	.03½	@	.04
Heels	*lb.*	.03	@	.03½
Horse-shoe pads	*lb.*	.03	@	.03½
Horse, air brake	*lb.*	.04¼	@	
fire, cotton lined	*lb.*	.01½	@	.01¾
garden	*lb.*	.01½	@	.01¾
Insulated wire stripping, free from fiber	*lb.*	.03½	@	.04
Matting	*lb.*	.01¼	@	.01½
Red packing	*lb.*	.05½	@	.06
Red scrap, No. 1	*lb.*	.09	@	.10
No. 2	*lb.*	.06¾	@	.07¼
		.10	@	.11
		.08	@	.09
TIRES:				
PNEUMATIC—				
Auto peelings, No. 1	*lb.*	.07	@	.08
No. 2	*lb.*	.05	@	.05½
Bicycle	*lb.*	.03	@	.03¼
Standard white auto	*lb.*	.03¾	@	.03⅞
Standard mixed auto	*lb.*	.04	@	
Stripped, unguaranteed	*lb.*	.03	@	
White, G. & G., M. & W., and U. S.	*lb.*	.05	@	.05¼
SOLID—				
Carriage	*lb.*	.04	@	.04¼
Irony	*lb.*	.01	@	
Truck	*lb.*	.03½	@	.03¾

THE MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

IN OCTOBER after hovering around 32 cents for a time with sharp fluctuations, the spot price for middling uplands cotton advanced steadily and reached 36.60 cents on October 24. Speculation was based on the conviction that the crop would be even shorter than the government estimate and that the quality would be poor. Rain and bad weather spoiled the cotton and interfered with picking the cotton in season, while the insect pests abounded, the boll weevil appearing further north than ever before. The

demand is very great and the prospect is that prices will be extremely high.

Egyptian Cotton. The supply of Egyptian cotton has been larger than was expected for the crop was good, though the staple was shorter than usual in many cases, owing to the native trick of cutting off the water in order to force the boll to open early. The high price offered offset in some degree English competition.

From the first to the middle of October, prices advanced sharply but later in the month the market fell off, medium Sakellarides bring quoted 58⅛ cents and medium uppers at 56 cents.

American-Egyptian. Arizona has yielded the largest crop yet produced, but this, combined with imported Egyptian, will not make up for the deficiency due to the shortage of Sea Island cotton. A fair amount of this cotton has been marketed and the demand, although somewhat restricted, continues to take care of the output of all gins. Prices have held steadily around 68 and 70 cents for the best grades.

Sea Island Cotton. Sea Island cotton conditions show no change, with an exceedingly small crop in prospect. The government estimate of 15,000 bales will probably be reduced at the end of the year. Good grades are demanding very high prices. Probably a good grade of average extra choice could be bought for 70 cents.

Tire Fabrics. The market is very strong. Increased production of tires and the condition of the cotton crop, with the increased shortage in long staple, make it impossible for the mills to meet the demand. The product is sold substantially to the end of 1920.

Other Fabrics. A like excess of demand over supply prevails with other cotton fabrics. For waterproofing materials, for sheetings, for hose and belting, for drills and ducks it is the same story of goods very scarce and deliveries for next year only. Asbestos cloth and yarns are hard to get; there are almost no imports from England and none from Germany.

NEW YORK QUOTATIONS.

October 25, 1919.

Prices subject to change without notice.

ASBESTOS CLOTH:		
Brake lining, 2½ lbs. sq. yd., brass or copper insertion	lb.	$0.85 @
2¼ lbs. sq. yd., brass or copper insertion	lb.	.90 @
BURLAPS:		
32—7-ounce	100 yards	*12.50 @
32—8-ounce		*13.50 @
40—7½-ounce		*14.15 @
40—8-ounce		*14.25 @
40—10-ounce		*18.00 @
40—10½-ounce		*18.25 @
45—7½-ounce		*16.85 @
45—8-ounce		*17.00 @
45—9½-ounce		None
48—10-ounce		*20.00 @
DRILLS:		
38-inch 2.00-yard	yard	.37½ @
40-inch 2.47-yard		.30¼ @
52-inch 1.90-yard		.48¼ @
52-inch 1.95-yard		.48¼ @
60-inch 1.52-yard		.62 @
DUCK:		
CARRIAGE CLOTH:		
38-inch 2.00-yard enameling duck	yard	.37½ @
38-inch 1.74-yard		.43 @
72-inch 16.66-ounce		.92½ @
72-inch 17.21-ounce		.96¼ @
MECHANICAL:		
Hose	pound	* .65 @
Belting		* .65 @
HOLLANDS, 40-INCH:		
Acme	yard	* .30 @
Endurance		* .38 @
Penn		* .46 @
OSNABURGS:		
40-inch 2.35-yard	yard	.29¾ @
40-inch 2.48-yard		.28¼ @
37½-inch 2.42-yard		.20 @
RAINCOAT FABRICS:		
COTTON:		
Bombazine 64 x 60 water-repellent	yard	.23 @
60 x 48 not water-repellent		.20 @
Cashmeres, cotton and wool, 36-inch, tan		.95 @
Twills 64 x 72		.43 @
64 x 102		.45 @
Twill, mercerized, 36-inch		.45 @
Tweed		.60 @ .70
printed		.24 @
Plaids 60 x 48		.21 @
56 x 44		.20 @
Repp		.45 @ .50
Surface prints 60 x 48		.21½ @
64 x 60		.24 @
IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING—PLAIN AND FANCIES:		
63-inch, 3¼ to 7½ ounces	yard	1.30 @ 3.50
36-inch, 2¾ to 5 ounces		.75 @ 1.90
IMPORTED PLAID LINING (UNION AND COTTON):		
63-inch, 2 to 4 ounces	yard	.90 @ 1.85
36-inch, 2 to 4 ounces		.55 @ 1.10
DOMESTIC WORSTED FABRICS:		
36-inch, 4½ to 8 ounces	yard	.65 @ 1.50
DOMESTIC WOVEN PLAID LININGS (COTTON):		
36-inch, 3¼ to 5 ounces		.21 @ .32
SHEETINGS:		
40-inch, 2.35-yard	yard	.30⅛ @
40-inch, 2.50-yard		.28¼ @
40-inch, 2.70-yard		.26½ @
40-inch, 2.85-yard		.25 ¼
40-inch, 3.15-yard		.28 @
40-inch, 3.60-yard		.24 @
JACKET:		
Delaware	yard	.30 @
Schuylkill	yard	.37 @
SILKS:		
Canton, 38-inch	yard	.57½ @
Schappe, 36-inch		.75 @

TIRE FABRICS:

17¼-ounce Sea Island, combed	pound	1.60	@
17¼-ounce Egyptian, combed		1.40	@
17¼-ounce Egyptian, carded		1.30	@
17¼ ounce, Peelers, combed		1.42	@
17¼-ounce Peelers, carded		1.00	@

*Nominal.

SEA ISLAND CROP MOVEMENT.

	Receipts. 1919-20.	Receipts. 1918-19.
Stock on hand, August 1, 1919		
FROM AUGUST 1, 1919, TO OCTOBER 31, 1919.		
Savannah, 4,901; Charleston, 90 ... *bales*	4,991	15,764
Received at Savannah (gross)	1,793	2,304
Received at Charleston	591	1,680
Received at Jacksonville	2,907	2,110
Totals	10,282	21,858
Less exports	5,474	9,938
Stock October 31, 1919:		
Savannah 4,215; Charleston 593	4,808	11,920
Crop in sight at all ports to date	5.291	6,094

From—	To Great Britain	Continent.	North Mills.	South Mills.	Total
Savannah	....	238	1,863	378	2,479
Charleston	....	. .	88	....	88
Jacksonville	....	....	2,907	....	2,907
Total	..	238	4,858	378	5,474
1918-19	144	. ..	9,144	650	9,938
	†144	*238	†4,286	†272	†4,464

*Increase. †Decrease.

(Compiled by John Malloch & Co., Savannah, Georgia.)

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

NEW YORK.

IN COMMON with other important industries the rubber trade is suffering from the abnormal freight and labor conditions prevalent. In New York movement of all water-borne freight has been stopped for weeks. These conditions have stimulated demand for spot stocks and raised prices. In some lines production is very much oversold and deliveries postponed.

ANILINE OIL. Almost impossible to obtain at present from spot stock. Futures are booked so far that manufacturers cannot name a price or promise deliveries a month or six weeks ahead.

BARYTES. Stocks very low owing to shipments being tied up by harbor strikes.

BENZOL. Spot stock at great premium, because supply in quantities is practically off the market on account of the steel strike.

GOLDEN ANTIMONY. In great demand with supply very short.

MAGNESIA, HEAVY CALCINED. Stocks short, manufacturers oversold and in some cases closed down because raw supplies cannot be obtained owing to freight and labor troubles.

MONTAN WAX. The first shipments since five years ago have arrived at this port and are now available.

SULPHUR. General advance in all grades since October 1.

WHITINGS. Held at a premium because stocks are very low as shipments are tied up by the longshoremen's strike.

NEW YORK QUOTATIONS.

OCTOBER 25, 1919.

Subject to change without notice.

ACCELERATORS, ORGANIC.			
Accelerator, N. C. C.	*lb.*	$0.50 @	
Accelerene, New York	*lb.*	4.75 @	
Accelemal	*lb.*	.55 @	
Aldehyde ammonia crystals	*lb.*	1.00 @	1.25
Aniline oil	*lb.*	.32 @	.33½
Excellerex	*lb.*	.55 @	.70
Hexamethylene tetramine (powdered)	*lb.*	.93 @	1.05
Paraphenylenediamine	*lb.*	$2.50 @	2.75
Thiocarbanilide	*lb.*	.55 @	.65
ACCELERATORS, INORGANIC.			
Lead, dry red (bbls.)	*lb.*	.10½ @	
sublimed blue (bbls.)	*lb.*	.08¼ @	
sublimed white (bbls.)	*lb.*	.08¼ @	
white, basic carbonate (bbls.)	*lb.*	.09 @	
Lime, flour	*lb.*	.02 @	.02¼
Litharge, domestic	*lb.*	.09¾ @	
sublimed	*lb.*	.10 @	
Magnesium, carbonate	*lb.*	.12½ @	
calcined heavy (Thistle)	*lb.*	.11 @	
light (Manhattan)	*lb.*	.35 @	
Magnesium oxide	*lb.*	.65 @	
Magnesite	*lb.*	.04 @	
ACIDS.			
Acetic, 28 per cent (bbls.)	*lb.*	.03 @	
glacial, 99 per cent (carboys)	*lb.*	.12 @	
Cresylic (97% straw color)	*gal.*	.77 @	.80
(95% dark)	*gal.*	.72 @	.75
Muriatic, 20 degrees	*cwt.*	1.75 @	2.00
Nitric, 36 degrees	*lb.*	.06 @	.06½
Sulphuric, 66 degrees	*ton*	19.20 @	
ALKALIES.			
Caustic soda, 76 per cent (bbls.)	*lb.*	.05 @	
Soda ash (bbls.)	*lb.*	.03½ @	
COLORS.			
Black:			
Bone, powdered	*lb.*	.05 @	
granulated	*lb.*	.09 @	
Carbon black (sacks, factory)	*lb.*	.13 @	
Drop	*lb.*	.06 @	.15
Ivory black	*lb.*	.16 @	.30
Lampblack	*lb.*	.15 @	
Oil soluble aniline	*lb.*	1.25 @	
Rubber black	*lb.*	.07½ @	
Blue:			
Cobalt	*lb.*	.25 @	.35
Prussian	*lb.*	.65 @	.75
Ultramarine	*lb.*	.18 @	.40
Brown:			
Iron oxide	*lb.*	.03 @	.03½
Sienna, Italian, raw and burnt	*lb.*	.05½ @	.12
Umber, Turkey, raw and burnt	*lb.*	.05 @	.06
Vandyke	*lb.*	.02½ @	.03½
Green:			
Chrome, light	*lb.*	.35 @	.40
medium	*lb.*	.40 @	.50
dark	*lb.*	.50 @	.60
commercial	*lb.*	.07 @	.15
Oxide of chromium (casks)	*lb.*	.75 @	.85
Red:			
Antimony, crimson, sulphuret of (casks)	*lb.*	.48 @	.55
Antimony, golden sulphuret of (casks)	*lb.*	.35 @	
golden sulphuret (States)	*lb.*	.28 @	
red sulphuret (States)	*lb.*	.25 @	
vermilion sulphuret	*lb.*	.55 @	
Arsenic, red sulphide	*lb.*	.22 @	
Indian	*lb.*	.08½ @	
Toluidine toner	*lb.*	3.50 @	
Iron oxide, reduced grades	*lb.*	.14 @	
pure bright	*lb.*	.16 @	
Spanish	*lb.*	.03½ @	
Venetian	*lb.*	.02 @	.04½
Oil soluble aniline, red	*lb.*	2.00 @	
orange	*lb.*	1.75 @	
Oximony	*lb.*	.18 @	
Vermilion, English, pale, medium, dark	*lb.*	1.55 @	1.65
White:			
Aluminum bronze, C. P.	*lb.*	.55 @	
superior	*lb.*	.60 @	
Lithopone, domestic	*lb.*	*.07 @	.07¼
Ponolith (carloads, factory)	*lb.*	.07 @	.07¼
Rubber-makers' white	*lb.*	*06½ @	.06¾
Zinc oxide, Horsehead (less carload, factory):			
"XX red"	*lb.*	.09 @	.09¼
"Special"	*lb.*	.09½ @	.09¾
French process, red real	*lb.*	.09½ @	.09¾
green seal	*lb.*	.10½ @	.10¾
white seal	*lb.*	.11½ @	.11¾
(States)	*lb.*	.08½ @	
Azo, ZZZ, lead free (less carload factory)	*lb.*	.09¼ @	
ZZ, under 5% leaded (less carload factory	*lb.*	.08¾ @	
Z, 8-10% leaded (less carload factory	*lb.*	.08¼ @	
Yellow:			
Cadmium, sulphide, yellow, light, orange	*lb.*	2.00 @	
red	*lb.*	1.85 @	
Chrome, light and medium	*lb.*	.27 @	
Ochre, domestic	*lb.*	.2½ @	.03½
imported	*lb.*	.05 @	.06½
Oil, soluble aniline	*lb.*	2.00 @	
Zinc chromate	*lb.*	.40 @	

COMPOUNDING INGREDIENTS.

Aluminum flake	ton	
Aluminum oxide	lb.	*.18 @
Ammonia carbonate, powdered	lb.	.13 ¼ @ .14
Asbestine (carloads)	ton	25.00 @
Asbestos (bags)	ton	35.00 @
Avoilas compound	lb.	.16 @
Barium, carbonate, precipated	ton	65.00 @
sulphide, precipitated	ton	.07 @
dust	lb.	.03¾ @
Barytes, pure white	ton	31.00 @ 33.00
Barytes, off color	ton	18.00 @ 20.00
uniform floated	ton	31.00 @ 33.00
Basofor	lb.	.04 @
Blanc fixe	lb.	.04 @
Bone ash	lb.	.05 @
Chalk, precipitated, extra light	lb.	.05 @ .05½
precipitated, heavy	lb.	.04 @ .04½
China clay, domestic	ton	8.50 @ 20.00
imported	ton	18.00 @ 23.50
Shawnee	ton	15.00 @
Cork flour	lb.	.53 @
Cotton linters, clean mill run, f. o. b. factory	lb.	.04 @
Fossil flour (powdered)	ton	60.00 @
(bolted)	ton	65.00 @
Diatomite	lb.	.03 @
Glue, high grade	lb.	.35 @ .40
medium	lb.	.16 @ .28
low grade	lb.	.12 @ .15
Graphite, flake (400-pound bbl.)	lb.	.10 @ .30
amorphous	lb.	.04 @ .08
Ground glass FF. (bbls.)	lb.	.03 @
Infusorial earth (powdered)	ton	60.00 @
(bolted)	ton	65.00 @
Liquid rubber	lb.	.16 @
Mica, powdered	lb.	.03½ @ .05
Pumice stone, powdered (bbl.)	lb.	.05 @
Rotten stone, powdered	lb.	.02½ @ .04½
Rub-R-Glu	lb.	*.20 @ .25
Silex (silica	ton	22.00 @ 40.00
Starch, powdered corn (carload, bbls.)	cwt.	5.84 @
(carload, bags)	cwt.	5.62 @
Talc, powdered soapstone	ton	15.50 @ 17.50
Tripoli earth, air-floated	ton	25.00 @
Tyre-lith	ton	85.00 @
Whiting, Alba (carloads)	cwt.	.80 @ .90
Columbia	cwt.	.80 @
commercial	cwt.	1.25 @
English cliffstone	cwt.	2.00 @
gilders	cwt.	1.35 @
Paris, white, American	cwt.	1.75 @
Quaker	cwt.	.70 @ .80
Wood pulp, imported	lb.	.03½ @
Wood flour, American	ton	36.00 @ 38.00

MINERAL RUBBER.

Gilsonite	ton	57.50 @
Genasco (carloads, factory)	ton	55.00 @
(less carloads, factory)	ton	57.00 @
Hard hydrocarbon	ton	30.00 @
K-X	ton	*120.00 @
K. M. R.	ton	*40.00 @ 60.00
M. R. X.	ton	100.00 @
Pioneer, carload, factory	ton	50.00 @
less carload, factory	ton	55.00 @
Raven M. R.	ton	.50 @ .70
Refined Elaterite	ton	175.00 @
Richmond	ton	75.00 @
No. 64	ton	45.00 @
318/320 M. P. hydrocarbon	ton	50.00 @
Robertson, M. R. Special (carloads, factory)	ton	80.00 @
M. R. (carloads, factory)	ton	55.00 @ 60.00
Rubpron (carloads, factory)	ton	50.00 @
(less car, factory)	ton	60.00 @
Walpole rubber flux (factory)	lb.	.05 @

OILS.

Castor, No. 1, U. S. P.	lb.	.22 @
No. 3, U. S. P.	lb.	.20 @
Corn, refined Argo	cwt.	23.76 @
Cotton	lb.	.23 @
Glycerine (98 per cent)	lb.	.21 @
Glycerole	lb.	.55 @
Linseed, raw (carloads)	gal.	1.72 @
Linseed compound	gal.	*.85 @
Palm (Niger)	lb.	.17 @
Peanut	lb.	.21½ @
Petrolatum	lb.	.06¼ @
Petroleum grease	lb.	.04¼ @
Pine, steam distilled	gal.	.90 @ 1.25
Rapeseed, refined	gal.	1.60 @
blown	lb.	.22 @
Rosin	bbl.	18.00 @
Soya bean	lb.	.18 @
Tar	gal.	.35 @ .40

RESINS AND PITCHES.

Cantella gum	lb.	.55 @
Tar, retort	bbl.	14.75 @ 15.00
kiln	bbl.	14.25 @ 14.75
Pitch, Burgundy	lb.	.09 @
coal tar	lb.	.03¼ @
pine tar	lb.	.03½ @
ponto	lb.	.14 @
Rosin [illegible]	[illegible]	None
[illegible]	[illegible]	None
[illegible]	[illegible]	None
Rosin, K	bbl.	19.50 @
Shellac, [illegible]	lb.	1.25 @ 1.35

SOLVENTS.

Acetone [illegible]	lb.	.15 @
methyl (drums)	gal.	1.15 @
Benzol, water white	gal.	.25 @ .28
Beta-naphthol, resublimed	lb.	1.00 @
ordinary grade	lb.	.48 @
Carbon bisulphide (drums)	lb.	.05½ @ .06¼
tetrachloride (drums)	lb.	.10 @ .12
Naphtha, motor gasoline (steel bbls)	gal.	.24½ @
73 @ 76 degrees (steel bbls.)	gal.	None
68 @ 70 degrees (steel bbls.)	gal.	None
Solvent	gal.	.20 @
V. M. & P. (steel bbls.)	gal.	.23½ @
Toluol, pure	gal.	.26 @ .30
Turpentine, spirits	gal.	1.71 @
wood	gal.	1.65 @
Osmaco reducer	gal.	.30 @
Xylol, pure	gal.	.35 @ .40
commercial	gal.	.30 @ .35

SUBSTITUTES.

Black	lb.	.10½ @ .19
White	lb.	.12 @ .23
Brown	lb.	.15 @ .22
Brown factice	lb.	.09 @ .21
White factice	lb.	.11 @ .22
Paragol sift and medium (carloads)	cwt.	18.50 @
hard	cwt.	18.08 @

VULCANIZING INGREDIENTS.

Lead, black hyposulphite (Black Hypo)	lb.	.52 @ .56
Orange mineral, domestic	lb.	.13¼ @
Sulphur chloride (drums)	lb.	.06 @ .06½
Sulphur, flour, Brooklyn brand (carloads)	cwt.	3.15 @
pure soft (carloads)	cwt.	3.20 @
superfine (carloads, factory)	cwt.	2.50 @

(See also Colors—Antimony.)

WAXES.

Wax, beeswax, white	lb.	.65 @ .68
ceresin, white	lb.	.15 @ .18
carnauba	lb.	.47 @ .48
ozokerite, black	lb.	.60 @
green	lb.	.75 @
Montan	lb.	.33 @
substitute	lb.	.20 @ .30
paraffine, refined 118/120 m. p. (cases)	lb.	.07½ @
123/125 m. p. (cases)	lb.	.07¾ @
128/130 m. p. (cases)	lb.	.08¾ @

*Nominal.

HEVEA IN SOUTHERN NIGERIA.

In southern Nigeria the *Hevea brasiliensis* seems to have become acclimatized. According to the "Nigeria Gazette," 300 five-year-old trees in the Sapele district yielded an average of a pound and a half of dry rubber in 1911. In 1912 four-year-old trees at Ebrite gave an average of seven pounds, while from September, 1916, to December, 1917, 1,000 eleven-year-old trees at Agege yielded 4,337 pounds.

Special Train of Fifty-Three Carloads Containing 8,435,000 Pounds of Crude Rubber Forwarded Over the Lehigh Valley Railroad to The Goodyear Tire & Rubber Co., Akron, Ohio, by the Williams Supply Agency, Inc., New York City.

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC GUTTA-PERCHA

Vol. 61 NOVEMBER 1, 1919. No. 2

TABLE OF CONTENTS.

	Pages
Editorials:	
Our Protest Against Radicalism	69
Substituting Bank Deposits for Pay Envelopes	69
The Return of the Bicycle	69
More Free Ports Needed	69-70
Utility of the Rubber Heel	70
Plantation Share Profits	70
China Yearns for Rubber Factories	70
Germany Revolutionizes Reclaiming	70
Minor Editorials	70
An Examination of German Synthetic Rubber. Illustrated. By Lothar E. Weber, Ph.D.	71-72
Rubber Instead of Typesetting. Illustrated	73-74
Interesting Letters from Our Readers	74
Poisons in the Rubber Industry. By Norman A. Shepard and Stanley Krall	75-77
Job Analysis and Written Standard Practice. By James Wright Cary	78-79
Vulcanization by the Use of the Sulphur Reaction Product of a Nitrogen Accelerator	80-81
Rubber Tariffs of North America	81-84
Chemistry:	
What the Rubber Chemists Are Doing	85-86
Chemical Patents	86-87
Laboratory Apparatus. Illustrated	87
The Rubber Association of America—Activities of	88
Peace Problems and Progress	89
Machines and Appliances. Illustrated	90-91
Electrically Driven. Calender and Mixers Equipped with Safety Devices. Rubber Solution and Cement Mixer. Two-Head Vertical Stranding Machine. Rodless Hydraulic Vulcanizing Press. A Novel Rubber Cement Dispenser.	
Machinery Patents. Illustrated	92
Machine for Impregnating Tire Fabric. Machine for Splitting Extruded Double Solid Tires. Other Machinery Patents.	
Process Patents	92
New Goods and Specialties. Illustrated	93-95
For the Protection of Linemen. Rubberized Life-Saving Suit. Cord Tire of Novel Design. Auto Baby Crib. Tiger Snail of Australia. "Utility Fitwell" Baby Pants. New Waterproof Cape. The "Line-a-Time" Helps the Copyist. Gored Storm Rubbers. To Minimize Punctures. New Heel with Pneumatic Inserts. The "Colonel" Golf Ball Dimpled. A Tire of Classic Design. Steamship Mail by Flying Boat. Rubber Mat for Running Boards. Gas Mask for Chemical Fumes. "Miladi-Daintie" Apron. Tool Kit for Vulcanizing. A Molded Cord Tire. A Classic Sandal. A Cushion Inner Tire. Convenient Fountain Pens. Adjustable Rubber Curve-Rulers.	
United States Commerce in Crude Rubber for Calendar Year 1918	96-97
Editor's Book Table	97
"Opportunities for Handicapped Men in the Rubber Industry." "The Condensed Chemical Dictionary." "Training in the Rubber Industry." "An Export Order and Allied Topics."	
New Trade Publications	97-98
Obituary Record	98
Major William Wright Harral. E. J. Slattery. G. W. Cummings. E. Macbean. G. Yonei.	
Treasury Decisions	98
Customs Appraiser's Decisions	98-99
Inquiries and Trade Opportunities	99
New Incorporations	100
American Rubber Trade—News Notes and Personals.	101-104
Financial Notes	101-102
Dividends	102-103
Rubber Share Quotations	103
E. D. Gibbs. Portrait and Sketch	108
John Young. Portrait and Sketch	108
Domestic Correspondence:	
Rhode Island. By Our Correspondent—Illustrated	105
New Jersey. By Our Correspondent	106
Massachusetts. By Our Correspondent	106-107
Eastern Notes	107-108
Ohio. By Our Correspondent	108-110
Mid-Western Notes	110-111
Southern Notes	111
Pacific Coast. By Our Correspondent	111-112
Canadian Notes	112
Foreign Rubber Notes:	
Great Britain. By Our Correspondent	113-114
French Rubber Statistics	114
André Dubosc. Portrait and Sketch	114
French Tests of Pneumatic and Solid Tires	114-115
The Reconstruction of Germany's Rubber Industry	115
German Trade Notes	115
Holland's Rubber Manufacturing Industry Grows.	115
Aluminum Latex Cups. Illustrated	115
Patents Relating to Rubber	116-117
United States. Canada. United Kingdom. France.	
Trade Marks	117
United States. Canada.	
Designs. Illustrated	117
United States.	
Markets:	
Crude Rubber	118
Highest and Lowest Prices	118
Antwerp Rubber Market	118
Amsterdam Rubber Market	119
Batavia Rubber Market	119
Singapore Rubber Auctions	119
Reclaimed Rubber	118
Rubber Scrap	128
Cotton and Other Fabrics	128-130
Chemicals and Ingredients	130-131
Statistics:	
Brazil, Exports from Manáos	119
Canada, Statistics for July	128
Cotton Statistics	120
Ceylon Imports and Exports	119
Federated Malay States Rubber Exports	119
Java Rubber Exports	119
Malaya Rubber Exports	119
Straits Settlements Rubber Exports	119
United Kingdom Statistics for August	128
United States:	
Crude Rubber Arrivals at Atlantic and Pacific Ports as Stated by Ships' Manifests	120-122
Exports During August, 1919 (By Countries)	124
Imports by Months for 1919	122
Statistics for Calendar Year 1918	125-127

CANADIAN CONSOLIDATED RUBBER CO., LIMITED

Executive Offices: MONTREAL, CANADA

CANADIAN CONSOLIDATED RUBBER CO. LIMITED
DOMINION
RUBBER SYSTEM
AND ASSOCIATED COMPANIES

CHARLES B. SEGER, President,
W. A. EDEN, Vice-President,
VICTOR E. MITCHELL, K. C., Vice-President,
R. E. JAMIESON, Director in Charge of Sales,
W. BINMORE, Secretary-Treasurer.

THE LARGEST MANUFACTURERS OF RUBBER GOODS IN THE BRITISH EMPIRE

12 Large Manufacturing Plants — 28 "Service" Branches throughout Canada

---

The Whitehead Brothers Rubber Co.

MANUFACTURERS OF

High Grade Mechanical Rubber Goods
"Long Life" Steam Hose
Suction Hose for all purposes
Water Hose, Belting, Packings
Springs, Valves, etc.

TRENTON, N. J.

EXCELLEREX

ZINC OXIDE—LITHOPONE

ALSO A COMPLETE LINE OF
CHEMICALS, PIGMENTS AND COLORS
FOR THE RUBBER TRADE

K&B

Katzenbach & Bullock Company

96 William St. New York, N. Y.

Boston Trenton Montreal Akron Chicago San Francisco

"BOSS" COUPLINGS

For Steam, Air and High Pressure Hose
BEST ROCK DRILL COUPLING MADE

Spud Standard Iron Pipe Thread

Clamp has Improved Features

Every Rubber Manufacturer and Jobber should know this coupling and have our prices.

DIXON VALVE & COUPLING CO.

PHILADELPHIA

New York Baltimore

DAVID FEINBURG CO.

NEW, OLD, CURED AND UNCURED

RUBBER SCRAP

11 BROADWAY, CHELSEA, MASS.

Cable Address
"Feinco" Chelsea
Liebers and A B C, 4 & 5 edition

Reg. United States Pat. Off. Reg. United Kingdom.

Published on the 1st of each month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.

Telephone—Bryant 2576.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, F.R.G.S., Editor

Vol. 61. DECEMBER 1, 1919. No. 3.

SUBSCRIPTION: $3.00 per year, $1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, $3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft. Post Office or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

DISCONTINUANCES: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

TABLE OF CONTENTS ON LAST PAGE OF READING.

SALVAGING RUBBER FROM THE DEEP.

RECOVERING TREASURE FROM SUNKEN SHIPS has always been a fascinating theme for the romancers and the novelists, and yet it now promises to have its practical side. Among the millions of dollars of cargoes sunk by the Germans in their campaign of ruthlessness on the high seas were large consignments of rubber in both the crude and the manufactured state. It is pointed out that of all articles other than metals, rubber is best adapted to remain submerged for a considerable time and yet be serviceable when recovered. At last accounts, the British had succeeded in raising 210 ships and recovering a large percentage of the cargoes, despite the painstaking manner in which the Germans sunk them and endeavored to render them useless for all time.

Now that the salvagers can work without interruption in vicinities where the depth of water does not preclude such operations, there seems to be no reason why a large amount of sunken cargoes may not be brought to the surface intact. Entire ships have been raised, and a vast number were sunk in depths where it is very possible to recover their cargoes. It is even said to be feasible in the case of the *Lusitania*, which went down in 270 feet of water with immense amounts of valuables in her hold, although the ship itself will probably always remain where the marine murderers sent her.

JAPANESE RUBBER AMBITIONS.

THAT JAPANESE RUBBER MANUFACTURERS have been taking advantage of the situation created by the war is indicated by the activity which is displayed in all branches of the industry throughout the Flowery Kingdom. Their accessibility to the rubber plantations of the Far East has enabled them to secure raw material in sufficient quantities to put full steam ahead in manufacturing and the inventive, or imitative faculties of the Nipponese have been given abundant opportunity for development, as the list of inventions published in the current Japanese rubber periodicals indicate. The *"Gomu-Shimpo-Sha"* devotes several columns in each issue to inventions credited to enterprising citizens of the Mikado's realms, some of them, doubtless but improvements, or adaptations of American and English articles on the market, but their being put forth with the Japanese trade-mark is sufficient to give them more than an equal chance with the products of their Anglo-Saxon commercial rivals.

Automobiles are of course plentiful, but the pneumatic-tired jinrikisha is in evidence everywhere. The demand for jinrikisha pneumatic tires has been extraordinary, as the reports of the tire firms indicate. There is a healthy commercial rivalry between the rubber merchants and manufacturers of Osaka and those of Tokio. Some very interesting comments on the condition of the rubber industry in Japan are contained in "The Japanese Rubber World" under the caption "Peace and the Rubber Industry."

"It is a fact," says that paper, "that rubber manufacturing and the industry in general is progressing rapidly throughout Japan. We may congratulate ourselves that the trade is of an enduring character. The price of rubber articles is cheaper than similar articles fashioned of leather, fabric or wood, particularly in regard to clothing. Particular attention should be paid by Japanese business men and manufacturers to the rapid growth of the plantation rubber industry. Enterprises of this kind fostered by Japanese capital should be pushed with all speed. Rubber in the future is destined to take the place of many materials used in this kingdom and now that peace is at hand we should do all in our power to prepare for the conditions that will ensue with the establishment of peace. Having been on a war basis for so long, the world is unprepared for the peace situation. But the conditions in the rubber business are good and the prospects are excellent. A big change is destined to be wrought in the rubber business in the future. It is safe to say that it will take the surplus rubber supply of the world two years to replace the lack of the raw material in Germany and Austria caused by the war. Similar conditions exist in other parts of the world.

"While Europe has been fighting, we have been developing our rubber manufacturing industries. Our producers have easy access to the rubber plantations of the East and they have increased their products despite the British export duties."

GERMAN SYNTHETIC ASPHALT.

Announcement has been made that Dr. Zimmer, the director of the A. G. Johannes Jeserich, at Charlottenburg, Germany, has worked out a process patented in all the principal countries for the production of synthetic asphalt which will render Germany independent of foreign sources of this material. A new company known as the *Gesellschaft Synthetischer Asphalt m. b. h.*, has been organized to exploit the invention and a factory is being erected at Velten near Berlin, but unsettled conditions in Germany render it uncertain when production will begin. The new invention may mean mineral rubber and open the field for a variety of plastics.

INDUSTRIAL TRAINING AND APPRENTICESHIP.

The policy of the War Department in urging manufacturers, as a help toward relieving industrial unrest and reducing the high cost of living, to undertake industrial training for their workers while at the same time paying them a living wage during their period of apprenticeship, has much to commend it. Increased production is the greatest need of the day. That it means lower prices is axiomatic, and that it must come through greater individual efficiency is self-evident.

It is estimated that some 6,000,000 workers are required in American factories to do what 4,500,000 could do if well trained. This means that the average worker is only 75 per cent efficient. By intensive government training, thousands of unskilled men in many trades were turned into skilled workers in a short time during the war, and the same method will produce similar results under corporate management.

Industrial training is the logical way to improve the situation, and manufacturers are the proper persons to undertake it. This imposes a heavy initial expense on the part of employers, but leading firms in the metal, shoe and numerous other trades that have tried the experiment agree that it is a profitable investment. Usually the workers more than pay for themselves while learning. In the rubber industry the plan has given excellent results, especially in training women engaged in footwear, drug sundry, mechanical and sporting goods factories, and may well be more generally extended to work done by men.

Employers everywhere respond eagerly to a sound plan of industrial training because it gives them an opportunity for advancement in position, earning power and living conditions. Manufacturers begin to realize that it increases plant productivity in both quantity and quality through greater efficiency rather than expenditure; that it produces leaders to take charge of work requiring skill and intelligence, and makes for contentment among operating forces. They see that raising the level of skill and education of their workers is building the greatest future bulwark of American industry.

FADS IN INDUSTRY.

It is a certain sign of progress that managers of industrial plants from time to time have tried out various systems for the purpose of increasing their output and improving the standard of both the workmen and managers. Perhaps some of them when subjected to close scrutiny might have been termed fads, but others have been productive of real good and there is reason for the belief that eventually a summary of these experiments will result in the adoption of a proved standardized system.

First came the epidemic of cost keeping. When this was at its height any reasonably intelligent clerk with a good address could get the job of installing a cost system. It lasted until managers of plants realized they were spending more time in ascertaining the costs of their work than in improving their production methods. Some of these systems survived, but many big plants in the country are managing to worry along without them.

Then came the efficiency slogan, which still prevails to some extent. Efficiency was heard from everywhere, and so-called efficiency experts went from factory to factory taking notes and promulgating theories. The keynote of the theories was: "If we could only make the workman efficient all would be well." It cannot be said that efficiency has been the cure-all, for despite the good it has undoubtedly done in some cases, industrial conditions in many parts of this country are deplorable. The Germans particularly devoted their energies to developing their workmen along lines of efficiency, being greatly assisted by the government which exercised strict control over many essential industries. It must be admitted that the Germans, previous to the war, had made considerable progress along these lines which was reflected by the standardized products of their factories.

Just now the owners and directors of plants are directing their attention to the improvement of the efficiency of those in control, for without efficient management it is shown that efficiency of workmen is relatively useless even if it is possible to get it. H. L. Gantt, a consulting management engineer of New York, in a recent address touched on the crux of this matter when he declared: "Our most serious trouble is incompetency in high places. As long as that remains uncorrected, no amount of efficiency in the workmen will avail very much. Can we find a measure, or even a correct indication, of that efficiency? I think we can, but we shall have to revise our methods of cost accounting, for those at present in vogue are not designed for that purpose."

Rubber—The One Normal Commodity.

By Henry C. Pearson, in "The Magazine of Wall Street."

FOR REASONS good and sufficient, all important commodities, with the single exception of india rubber, have doubled, trebled or quadrupled in price in the last four years. Why the apparent indifference of the great gum elastic industry to the high cost germ? It is thus explained:

The real beginning of crude rubber expansion was in 1876, when the British Government succeeded in establishing a small orchard of Pará rubber trees at Peradeniya Gardens, Heneratgoda, Ceylon. This was followed by the discovery of "wound response." In plain words this means that the Pará tree, the *Hevea*, can be milked daily, while other rubber trees and vines must rest after milking for months and even years.

With cheap and docile coolie labor it was soon found that plantation rubber could be produced cheaper and of as good quality as wild rubber. And numerous plantations in Ceylon, the Straits Settlements, Federated Malay States, Java and Sumatra were established. Just as the best of these came into bearing the automobile began its spectacular career. The demand for rubber became so great that from a normal price of $1.25 a pound it sold as high as $3 a pound. The dividends thus earned by the plantation companies, two and three hundred per cent, set English and to a lesser degree Dutch and Belgian investors aflame, and the "Rubber Craze" ensued.

HENRY C. PEARSON.

New companies were formed by the hundred and the jungles cleared and planted in record time. So great was the expansion that the 100,000 acres in existence in 1905 had expanded to nearly 2,000,000 acres at the outbreak of the Great War. And the world's annual production in that period grew from 62,000 tons to 120,000 tons. Nor did the plantations stop at that figure. In spite of the war the product for 1917 was 256,976 tons, or more than double in two years and increasing at about 50,000 tons a year. Thus it is apparent that there is plenty of rubber.

PRE-WAR CONDITIONS.

At the beginning of the war plantation rubber was low. The $1.25 rubber had given place to a 65 to 70-cent level, and it was to sink even lower. In spite of sporadic upward flurries it worked downward until 40 cents became the purchasing price. As the cost to the planter varies from 17 to 24 cents there was still a fair margin of profit, and the planters continued to sell. This in spite of frantic efforts on the part of planters' associations and hungry stockholders to restrict output, to valorize, to do anything to enhance the price.

Keeping pace with this increase in the output of crude rubber was the spectacular demand for pneumatic tires and tubes, for solid truck tires and an increased demand for all kinds of rubber goods.

In the light of such a market almost any merchants other than the far-sighted English would have held the customer up for higher prices. To be sure the big users were already possessed of big stocks, forward sales had been negotiated and there were vast supplies of reclaimed rubber available.

It was plainly seen that it was the part of wisdom to make it to America's advantage to buy in the Far East. For should that supply for any reason be withheld or fail, a very few years would suffice to install great plantations perhaps in Mindanao, Philippine Islands, where soil and climate are ideal, and plenty of seed available. Or the great American *Castilloa* plantations in Mexico, which were about to be replanted with Pará trees in the time of Diaz, might be suddenly available were present conditions reversed. If not there, perhaps in Guatemala, Honduras, Panama, Colombia, Venezuela or Brazil. With proper governmental guaranties from the countries named and a reasonable amount of sympathetic support from one's own government great planting projects could easily be installed. Indeed, they doubtless would be if the necessity arose.

Then there is the purely domestic experiment of "machine grown" rubber, right within our own borders and eventually taking its place with such enterprises as the cultivation of the sugar beet.

Then there are the extensive fonts of the Amazon and her mighty tributaries with a wealth of rubber trees, only the fringe of which has been touched. In the event of shortage the volume of rubber from Brazil, northern and southern, and from Bolivia and Peru would be increased enormously, and Africa, once the great rival of South America, would again figure as a big rubber producer. Furthermore, several of the great American companies have installed huge Pará rubber plantations of their own in the Far East. The constantly increasing product of three orchards, one of which is the largest in the world, and said to be the most economically administered, had a wonderfully steadying effect upon the market and was assailed by jingo papers as the "American invasion." Thus it was that the planters continued to produce and to sell, and in spite of lessend cargo space and the thousand and one handicaps of a great war the price of rubber continued low.

In the meantime the American rubber business grew and grew and at the time of the signing of the armistice we were using three times as much rubber as when the war began.

PRICES DECLINE.

With such a market for manufactured goods, even if the basic material be low, prices might well be high. But they became lower and lower during the first years of the war and with only two exceptions are still far lower than those of the other commodities.

One has only to study the accompanying Lubin graphs to see how remarkably low have been manufactured rubber goods.

Low priced crude rubber does not necessarily mean low priced rubber goods. The reason is rubber goods are built up of rubber, fabrics, compounding ingredients and labor. The rubber has been cheap but everything else entering into the finished product has shared in the great advance in price.

There are some 250 separate ingredients as solvents, fillers, vulcanizing ingredients, etc., regularly used by rubber manufacturers in rubber mixing processes. The prices of some went so high as to be prohibitive. Others disappeared from the market. All increased appreciably in price. A good instance is naphtha, which went from 13 cents to 24 cents and did not

recede. The same was true of the 50 or more types of fabrics upon which the trade was dependent. As for tools, machinery, building material, labor, all took part in the advance.

To offset this which for the moment looked like calamity there took place a rapid revolution of methods of manufacture that is one of the most remarkable incidents of a remarkable industry.

PRODUCTION SPEEDED UP.

The scarcity of skilled labor caused by the draft resulted in the invention of hundreds of machines that turned hand-made goods into machine-made and if anything bettered the product. Old machines were scrapped and everything that the best mechanical engineers could offer to speed up production was promptly adopted. Team work of man and machine was applied in all lines of manufacture.

The chemist was called upon to add his assistance. An elastic organic substance, rubber-like to a degree, of low cost, made from waste material, was so treated that it could be incorporated in the best rubber and actually added to its value. This in itself saved thousands of pounds of rubber. The time consumed in vulcanization was lessened by half by the use of catalyzers, that is by accelerators, or hasteners, so that there was a notable saving in steam and labor and an increase in production.

Speaking of time conserved in vulcanization: for years the great rubber shoe industry was handicapped by the so-called dry-heat cure requiring seven hours of slow baking. A revolution in this was wrought by the pressure cure, taking but a third of the time and incidentally allowing the use of a far wider range of compounds and producing a better product at a lower cost.

The great changes, mechanical and chemical, while apparently centering about the tire and footwear business, actually occurred in a notable degree in all lines of hard and soft rubber manufacture.

Working together the members of trade assured their supply of crude rubber from England by pledging themselves to purchase only for their own consumption. When war needs practically cut off their supply of zinc oxide, the notable tire toughener, they promptly substituted a toughening black that was useless in munition work. When cotton promised to be scarce certain of the big manufacturers planted thousands of acres of cotton and built gins by the score.

The labor situation in rubber, considering the general unrest, was handled with wisdom. Strikes were few and of brief duration. Manufacturers kept ahead of the H. C. of L., as far as their help was concerned, by successive increases of wages; by instituting factory stores, markets and war gardens and by providing housing facilities on a scale never before dreamed of. By piece work, bonuses, profit-sharing, premiums, pensions, insurance and hospitals, they made work profitable and the worker secure. Reading and recreation clubs were provided and a degree of friendliness and cooperation between employer and employe was the very definite and satisfactory result.

All of these efforts helped to keep the price of rubber goods down. In 1914, 1915 and 1916 rubber goods were on the average much lower than they were in 1913. In 1917 the constantly increasing cost of all materials except crude rubber brought prices up to the pre-war level. Since then there have been advances aggregating about one-third of the rise shown in "all other products." With it all the trade has prospered as never before and with no profiteering accusations made against it.

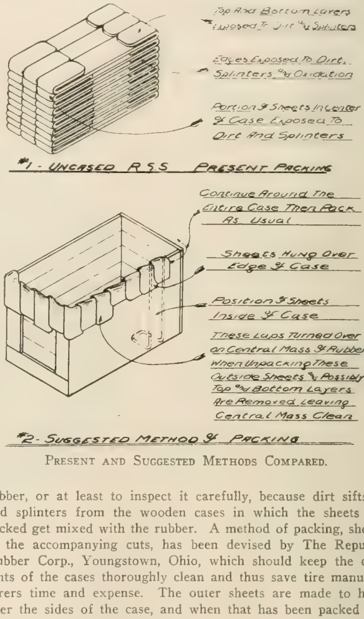
THE OUTLOOK.

As to the future there seems to be no need for uneasiness. The American industry, besides being the biggest in the world's rubber business, is by far the best equipped mechanically, chemically and in personnel.

It is, of course, dependent upon England and to a degree upon Holland for its raw product. England, however, never plays fast and loose with good customers, nor does Holland. Besides which we have cotton, a raw material that England needs as much as we need rubber. But beyond this is the ability of the industry to adapt itself to shortages without stopping and to provide for itself anything, anywhere, anytime.

A SUGGESTED METHOD OF PACKING SMOKED SHEETS.

Though the better plantations in the Far East use great care in packing ribbed smoked sheets, which is a standard grade of plantation rubber, still the consumer is obliged to wash the



PRESENT AND SUGGESTED METHODS COMPARED.

rubber, or at least to inspect it carefully, because dirt sifts in and splinters from the wooden cases in which the sheets are packed get mixed with the rubber. A method of packing, shown in the accompanying cuts, has been devised by The Republic Rubber Corp., Youngstown, Ohio, which should keep the contents of the cases thoroughly clean and thus save tire manufacturers time and expense. The outer sheets are made to hang over the sides of the case, and when that has been packed full the laps are turned back over the rest of the contents.

RUBBER FINANCES IN MALAYA.

The Seaport (Selangor) Rubber Estate, whose plantations are in Klang and Kuala Lumpur in Malaya, reports that in the fiscal year 1918-1919 rubber amounting to 397,500 pounds was collected, a shade less than the year before. The cost of production f.o.b. at port of shipment was 18.84 cents a pound, against 20.665 cents in 1917-18. The net sale price was 40.864 cents a pound. The profits for the year were $95,973.71; out of these and those carried over from the year before a dividend of 12 per cent was paid out and the remainder, $66,101.08, was carried forward to the following year.

The total planted area of the estate is 1,969 acres, of which 184 acres, planted in 1917, are not yet in bearing; the remaining 1,785 rubber yielding acres were planted between 1905 and 1914. The crop for the year ending June 30, 1920, is estimated at 550,000 pounds.

The Effect of Organic Accelerators on the Vulcanization Coefficient.[1]

By D. F. Cranor.

A brief discussion of the already published work on the relationship of the mechanical properties of vulcanized rubber to the chemical composition, and a description of experiments with certain powerful accelerators which demonstrates that under certain conditions good mechanical properties can be obtained in rubber with a very low degree of chemical combination of sulphur.

DURING THE PAST FEW YEARS considerable material has been published regarding the relationship of the mechanical properties to the chemical composition of vulcanized rubber. It has been demonstrated that if vulcanization is carried to a point where maximum physical properties are obtained in the freshly cured goods, such goods are overvulcanized and subject to rapid deterioration; also, that the proper degree of vulcanization for soft rubber can be accomplished with less chemical combination of sulphur in the case of quick curing stocks, than with compounds which require prolonged heating to effect vulcanization. It is apparently quite generally believed that the coefficient of vulcanization for a properly cured pure gum mixing of good quality plantation *Hevea* rubber lies in the neighborhood of three, although it has been impossible to determine a coefficient which definitely represents the so-called optimum cure.

The fact that almost all practical rubber formulas to-day contain some one of the many organic accelerators makes further research necessary if scientific methods are to be applied to the estimation of the degree of cure of the mixings containing these substances. I have, therefore, undertaken extended work along these lines with view to making my testing methods more accurate and satisfactory. It has been the thought of the writer that results of greatest significance would be such as would indicate the amount of sulphur combination required to effect proper cure in a given sample of crude rubber, as compared with the combination necessary when the same rubber has added to it organic accelerators of various degrees of efficiency. Accordingly I have determined the physical properties and vulcanization coefficients of various samples of crude rubbers, when cured with and without accelerators, and have chosen certain series covering some of the results obtained in connection with powerful accelerators.

The determinations here described were made upon a mixing of standard ribbed smoked sheet and a sample of inferior brown plantation crêpe. In both cases 100 parts of rubber were mixed with 6 parts of sulphur and 1 of zinc oxide. The latter was included in order to have the compound workable to best advantage with accelerators which exert a maximum effect only when used in the presence of zinc oxide. The sulphur was set at 6 per cent on the weight of rubber, it being desired to use enough to get a stock capable of being overcured before showing the phenomena of reversion, which has been mentioned by Schidrowitz, and at the same time one in which the amount of sulphur is sufficiently low to obviate acceleration due to an excess, thus allowing the effect of the catalysts to be most clearly demonstrated. The percentage of zinc oxide is held at a minimum, it being used only to activate the accelerators added to these mixings. Even such an amount exerts a slight retarding action on the combination of sulphur, this having been proved by Van Heurn (See THE INDIA RUBBER WORLD, page 251, February 1, 1919), and also by personal experience in our laboratory. This substance is also a factor in fixing the physical properties of the product, but it is necessary to include it in the basic formula in order to preserve the similiarity of these mixtures with the treated compounds.

[1]Read before the Rubber Division of the American Chemical Society at Philadelphia, Pennsylvania, September 5, 1919.

It will be noted by referring to Table I that the smoked sheet was vulcanized through a wide range of time changes at a vulcanizing temperature of 292 degrees F., or approximately forty-five pounds' steam pressure. All test specimens were cut by a die from sheets approximately 0.100-inch thick, which were vulcanized in an ordinary platen press, the temperature of which was controlled by a reducing valve. The tensile strength, ultimate elongation and loads required to produce definite elongation were determined by a Scott vertical combination rubber-and-fabric testing machine, the pulling jaw of which travels at a uniform rate of 20 inches per minute. The tensile product was calculated according to the method of Stevens. "Set" was determined in the case of the results recorded in Table I by stretching the specimen from one to eight inches and holding at such elongation for a period of ten minutes. The measurements were made ten minutes after releasing the samples from the jaws of the stretching device.

In the following tables the samples used for the "set" test were also stretched to eight inches, except in series where the figures for ultimate elongation are less than one to nine, in which case the samples for "set" were stretched from one to seven inches. As a matter of fact, practically no value is to be attached to the "set" results, as in many cases the figures are identical for samples having otherwise widely vary characteristics. They are inserted only to make the results complete, since the test is one which seems to be much used in general testing practice. The coefficient of vulcanization has in every instance been calculated from a direct determination of combined sulphur, made upon a sample extracted in acetone for a period of 24 hours at the boiling temperature of the solvent. The method used is the nitrate acid-bromine oxidation followed by fusion with potassium nitrate in presence of sodium carbonate. Two determinations were made upon each sample, and in almost every case the results check to within 0.10 per cent.

TABLE I.

COMPOUND A. UNRESTED SMOKED SHEET. FRESHLY CURED SAMPLES TESTED 24 HOURS AFTER VULCANIZATION.

Minutes Curing at 292° F.	Tensile Strength Lbs. per sq. in	Ultimate Elongation. Inches.	Tensile Product.	Load 700% E.	Load 800% E.	Perm. Set	Coef. of Vulc.
85	1616	1 to 9.6	1492	583	1080	12.3	1.77
100	1646	9.6	1519	570	1230	12.5	1.95
115	1788	9.6	1650	680	1310	12.5	2.18
130	1856	9.6	1713	700	1330	12.5	2.85
145	2213	9.7	2064	739	1515	12.5	3.52
160	2133	9.5	1948	788	1500	12.5	4.08
175	2020	9.3	1806	883	1740	14.1	4.36
190	2313	9.6	2134	950	1840	15.6	4.76
205	2203	9.4	2000	1040	2100	9.4	5.07
220	2400	9.3	2146	1005	2010	Broke	5.25
235	120	4.5	52	Broke	Broke	Broke	5.47

It is seen with the smoked sheet that the series commences with a "heat" quite insufficient for proper vulcanization, and continues through 15 minutes' time changes to cover the entire range, including under, good and overvulcanization, and finally in the case of the last two members of the series, reversion and degradation due to overheating after the free sulphur content has been reduced to less than 1 per cent. This is especially

apparent in the 235-minute cure which has a strength of 120 pounds and an elongation of only 350 per cent or 1 to $4\frac{1}{2}$ inches. If superior physical characteristics were to be taken as the vulcanization criteria, the 190-minute cure which shows the greatest tensile product, or the 205-minute which shows the greatest resistance to stretching, would be selected. However, the former has a vulcanization coefficient of 4.76, and the latter of 5.07, and the author is confident that any rubber man would pronounce these pieces to be overvulcanized after making the most superficial examination. Unfortunately, insufficient time has elapsed since the original preparation of the samples to publish the results of natural weathering tests at this time. But accelerated aging test, if applied to an entire series such as this, will show those members which are decidedly over or undercured, and the results of physical and chemical tests made upon specimens so treated are, therefore, given in Table II:

TABLE II.

COMPOUND A. UNTREATED SMOKED SHEET. ACCELERATED AGE RESULTS. TESTED 24 HOURS AFTER REMOVAL FROM HEATING OVEN.

Minutes Curing at 292° F.	Tensile Strength. Lbs. per sq. in	Ultimate Elongation. Inches.	Tensile Product.	Load 700%-E.	Load 800%-E.	Sub. Perm. Set	Coef. of Vulc.
100	1673	1 to 9.3	1495	818	1550	12.5	1.97
115	1943	9.1	1700	1100	1970	12.5	2.33
130	2283	9.0	1975	1435	2283	12.5	3.15
145	1807	8.2	1424	1740	Broke	13.5	3.69
160	1225	7.4	571	Broke	Broke	Broke	4.02
175	1378	7.2	954	Broke	Broke	Broke	4.39
190	1168	7.1	797	Broke	Broke	Broke	4.74
205	77	3.8	28	Broke	Broke	Broke	5.13
220	77	3.5	26	Broke	Broke	Broke	5.30
235	0	....	....	Broke	Broke	Broke	5.43

It is seen by the accelerated age test, that the sample cured 130 minutes, having original vulcanization coefficient of 2.85 (Table I), is the best of the series. It will be noted that this cure yields sample having a maximum strength, tensile product

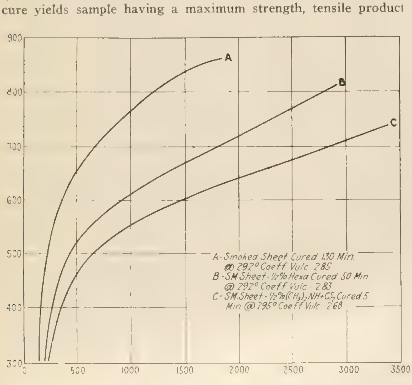


FIG. 1. STRESS-STRAIN CURVES.

and the greatest resistance to stretching after the accelerated aging treatment. The selection of this as the best cured sample is well in accordance with the conclusions of Stevens in a paper read before the Society of Chemical Industry. In this it was shown that first-grade plantation rubbers vulcanized to a sulphur combination of about three stood up well during an aging period of 120 weeks, whereas those cured to a greater degree deteriorated quite rapidly. This same figure has been indicated as the proper coefficient for a mixing of the nature in question by Spence, Kratz, Van Heurn and others.

Following the preparation and testing of the series above mentioned, the accelerators hexamethylene tetramine and dimethylammonium-dimethyl-dithiocarbamate (the addition product of dimethylamine and carbon bisulphide) were separately added to the original mixing, namely: smoked sheet 100 parts, sulphur 6 parts, zinc oxide 1 part, in the proportion of ½ of 1 per cent to the rubber contained in the batch. The former was selected as a moderately active accelerator and the other as an example of a group which probably comprises the most active accelerators known and, therefore, one of the most valuable for use in illustrating the extreme possible effects of accelerators on the mechanical and chemical properties of the resulting vulcanizates. This substance has been mentioned in the literature of rubber chemistry and should be a familiar one (see "Chemical Abstracts," January 10, 1918). The results in Table III show the effect of hexamethylene tetramine on the mixing.

TABLE III.

COMPOUND A. CONTAINING AN ADDITION OF ½ OF 1 PER CENT HEXAMETHYLENE TETRAMINE. SAMPLES TESTED 24 HOURS AFTER VULCANIZATION.

Minutes Curing at 292° F.	Tensile Strenggth Lbs. per sq. in.	Ultimate Elongation. Inches.	Tensile Product.	Load 600%-E.	Load 700%-E.	Load 800%-E.	Sub. Perm. Set.	Coef. of Vulc.
30	1970	1 to 9.6	1818	400	830	1630	9.4	1.50
40	2330	9.4	2286	600	1160	2170	12.5	1.99
50	2900	9.1	2537	935	2070	2850	18.7	2.83
60	3015	9.1	2686	870	1780	2860	15.6	3.62
70	2580	9.3	2307	580	1110	2380	9.4	4.23
80	2340	9.4	2115	495	1000	2050	7.8	4.82

It is apparent from these figures that the compound containing this substance not only cures in about one-third the time required for vulcanization of the untreated rubber in the same formula, but the relationship of mechanical properties to chemical composition is altogether altered. If we refer the physical properties to the vulcanization coefficient as standard, by comparing the 50-minute cure with coefficient of 2.85 with the 130-minute "correct" cure of the untreated smoked sheet with coefficient of 2.85, it is seen that the "hexa" stock has 1,044 pounds per square inch greater tensile strength, one-half inch less stretch, a tensile product higher by 824, and that more than twice the load is required to stretch this stock to a given elongation. Making allowance for the toughening effect of the accelerator, the "hexa" compound is somewhat overvulcanized at the 50-minute cure.

In Table IV are indicated the results obtained by using the dimethylamine addition product at a vulcanizing temperature of 292 degrees F.

TABLE IV.

COMPOUND A. CONTAINING IN ADDITION ½ OF 1 PER CENT DIMETHYLAMMONIUM-DIMETHYL-DITHIOCARBAMATE (THE ADDITION PRODUCT OF DIMETHYLAMINE AND CARBON BISULPHIDE). SAMPLES TESTED 24 HOURS AFTER VULCANIZATION.

Minutes Curing at 292° F.	Tensile Strength Lbs. per sq. in.	Ultimate Elongation. Inches	Tensile Product.	Load 600%-E.	Load 700%-E.	Load 800%-E.	Sub. Perm. Set.	Coef. of Vulc.
1	1680	1 to 9.6	1530	375	725	1300	9.4	0.57
2	2340	9.6	2160	430	880	1675	9.4	0.77
3	2418	9.2	2140	582	1195	2207	9.4	1.09
4	2691	9.2	2303	600	1225	2398	9.4	1.21
5	2698	9.1	2303	655	1365	2508	9.4	1.45

In this instance it is seen that samples having satisfactory physical properties were obtained in vulcanizing periods of three, four and five minutes with the abnormally low coefficients of 1.09, 1.21 and 1.45, respectively. The same mixture was also vulcanized at 295 degrees F., the results being given in Table V:

TABLE V.

Same stock as reported in Table IV cured at higher temperature. Samples tested 24 hours after vulcanization.

Minutes Curing at 295° F.	Tensile Strength Lbs. per sq. in.	Ultimate Elongation Inches	Tensile Product	Load 600% E.	Load 700% E.	Sub. Perm. Set	Coef. of Vulc.
[illegible]	[illegible]	1 to 9.2	2494	710	1490	[illegible]	1.10
[illegible]	[illegible]	8.9	[illegible]	1060	2330	9.4	1.59
[illegible]	[illegible]	8.4	[illegible]	1500	2930	9.4	2.15
5	[illegible]	8.4	2734	1460	2910	12.5	2.68

Note. The greater degree of cure of this series as compared to that cured at [illegible] degrees can hardly be entirely attributed to the slight increase in temperature. It is probable that the raw stock was heated to a greater degree in the course of mixing.

In this series, the sample cured five minutes (coefficient 2.68) closely approaches the 2.85 coefficient of the correctly cured standard smoked sheet. Comparing the physical characteristics of these two, we find a difference of 1,554 pounds tensile strength in favor of the accelerated stock, a loss of 1.2 inches in elongation at the breaking point, a tensile product higher by 1,021, and an even greater resistance to stretching than in the case of the rubber containing hexamethylene tetramine. This sample is undoubtedly much overvulcanized.

Figure 1 shows the stress-strain curves of the three samples, all taken from the same lot of rubber and all cured to vulcanization coefficients of 2.68 to 2.85 by means of vulcanizing periods, ranging from five minutes to two hours and ten minutes. It affords a graphic illustration of the variation in physical properties referred to essentially the same vulcanization coefficient.

Figure 2, on the other hand, illustrates the range of the vulcanization coefficients for the same samples, referred to the load required to produce a uniform elongation of 700 per cent. By reference to these curves, we find that about 4.9 per cent of combined sulphur is necessary to produce a sample of untreated rubber requiring a load of 1,000 pounds to stretch it through 700 per cent. In the case of the same rubber containing an addition of ½ of one per cent of "hexa," the same effect was produced when about 1.8 per cent of sulphur has been combined. With the introduction of the dimethylamine addition product, the corresponding coefficient drops to 0.9 per cent. Figure 2 also includes a curve representing the compound reported in Table VI, which consists of the basic formula and 1 per cent of the dimethylammonium-dimethyl-dithiocarbamate.

TABLE VI.

Compound A. Ribbed smoked sheet, 6 per cent sulphur and 1 per cent zinc oxide, to which has been added 1 per cent of dimethylammonium dimethyl dithiocarbamate. Stocks calendered and stored between sheets of holland cloth at room temperature. Range about 70 to 90 degrees F.

Vulc. Cond. Room Temp.	Tensile Strength. lbs. per sq. in.	Ultimate Elongation. Inches.	Load at 600% E.	Load at 700%—E.	Coef. of Vulc.
33 days' storage	*2090	1 to 8.4	810	1610	0.77
2 months' storage	†2458	1 to 8.5	740	1700	1.05
33 days' storage	‡2290	1 to 9.4	740	1040	0.77
2 months' storage	§2266	1 to 8.6	705	1625	1.05

*Sample cut with the grain.
†Sample cut with the grain.
‡Sample cut across the grain
§Sample cut across the grain

These samples were not heated at all, being mixed, calendered and stored in the dark between sheets or holland cloth. The tests shown were made one month and two months after preparation, and certainly show that spontaneous vulcanization has taken place to a very considerable extent. With this mixing we find, by extending the curve toward the zero point, that this unheated material would require the load of 1,000 pounds to stretch it to 700 per cent when only 0.7 per cent of sulphur has entered into combination with the rubber. The general tendency is for the curves to flatten toward the load axis as the period of heating is reduced, and this gives some indication of the extent to which rubber is depolymerized by heat and shows that extremely low sulphur combination is sufficient to vulcanize when the period of heating is reduced to a minimum or entirely omitted. The turn of the curve representing the untreated rubber in the neighborhood of the 5 per cent combined sulphur line again illustrated the reversion which takes place when heating is continued after the bulk of the sulphur has entered into combination. The turn at the 3 per cent point, in the case of the "hexa" sample is indicative of the great care necessary when

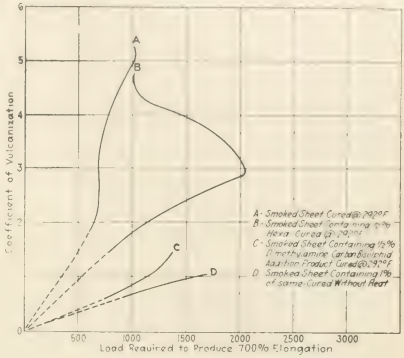


Fig. 2. Range of Vulcanization Coefficient.

using this substance, since if the sulphur in the compound is held down to a figure which is too low, results equally as disastrous as those coming from overcure will inevitably follow the overheating of such compounds.

Work along very similar lines was also carried out with an inferior type of brown plantation crêpe, the results of which are indicated in Tables VII and VIII:

TABLE VII.

Compound A, in which inferior brown plantation crepe is substituted for stanard ribbed smoked sheet. Samples tested 24 hours after vulcanization.

Minutes Curing at 292° F.	Tensile Strength. Lbs. per sq. in.	Ultimate Elongation. Inches.	Tensile Product.	Load 600% E.	Load 700% E.	Sub. Perm. Set.	Coef. of Vulc.
190	630	1 to 8.5	515	330	515	9.4	2.72
240	943	8.4	752	423	800	6.3	3.45
300	785	7.0	528	785	Broke	4.2	4.61

TABLE VIII.

Same stock as reported in Table VII with addition of ¾ of 1 per cent dimethylammonium-dimethyl-dithiocarbamate. Samples tested 24 after vulcanization.

Minutes Curing at 292° F.	Tensile Strength. Lbs. per sq. in.	Ultimate Elongation. Inches.	Tensile Product.	Load 600% E.	Load 700% E.	Sub. Perm. Set	Coef. of Vulc.
[illegible]	1520	1 to 8.5	1242	680	1195	12.5	....
[illegible]	2480	8.7	2074	943	1745	9.4	1.18
3	[illegible]	8.4	2278	1383	2510	12.5	1.73
[illegible]	[illegible]	[illegible]	2314	1406	2530	10.9	2.03
5	3337	[illegible]	2727	1420	2600	[illegible]	2.24
[illegible]	3000	8.5	[illegible]	1122	2220	10.9	2.77

In this case, the figures reported are limited to the tests made on the straight rubber and the same rubber to which was added ¾ of 1 per cent of the dimethylamine-carbon bisulphide addition product. Preliminary tests on this rubber treated with hexamethylene tetramine showed that satisfactory vulcanization could only be obtained with the addition of higher proportions of zinc oxide. Figure 3 shows the complete stress-strain curves

of 120, 180, 240 and 300-minute cures at 292 degrees F. on the rubber with 6 per cent sulphur and 1 per cent zinc oxide, these being represented by the dotted line curves A, B, C and D, respectively. On the same graph there is also indicated the stress-strain curves corresponding to 1, 2, 3, 4 and 5-minute cures at 292 degrees F. in case of the same mixing containing a ¾ of one per cent addition to the powerful catalyst, these being the solid lines E, F, G, H, J and K, respectively. Addition of ½ and ⅝ of 1 per cent were not sufficient to produce good vulcanization at a temperature of 292 degrees in periods ranging from 2 to 5 minutes. These results are in general similar to those obtained by adding the accelerator to the smoked sheet, but are more notable, inasmuch as the brown crêpe was altogether incapable of being well vulcanized in its natural state, whereas through the use of the accelerator, samples having good physical properties are produced in extremely short vulcanizing periods.

It is to be noticed that the sample in Table VI cured 240 minutes and represented by Curve C in Figure 3, has all the characteristics of a technically undercured sample, although the coefficient amounts to 3.45, which is well above the 3 per cent limit mentioned for first-grade rubbers. On the other hand, the sample cured for 300 minutes is undoubtedly both overcured and overheated. The best cure would, therefore, fall between these points, but it is evident that no good cure is possible with this rubber except through treatment with chemical accelerating agents.

Although more results would be required before any definite conclusions should be drawn, the writer would summarize as follows:

SUMMARY.

(1) Although average good quality plantation *Hevea* rubbers may require a combination of sulphur of about 3 per cent to effect the proper or optimum cure, such rubbers can be vulcanized in a small fraction of the original time through the use of very powerful catalysts, together with zinc oxide, in which case excellent physical properties are obtained in samples, the vulcanization coefficient of which may be in the neighborhood of one.

(2) Inferior types of plantation rubbers which are incapable of being transformed into satisfactory vulcanizates through the

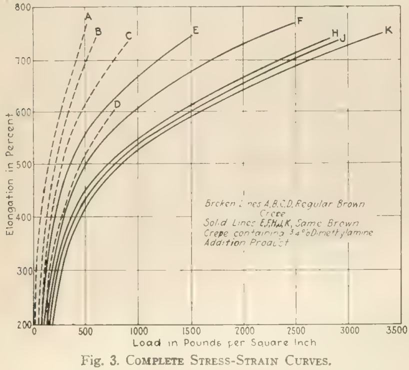


Fig. 3. Complete Stress-Strain Curves.

agency of sulphur alone may be readily vulcanized in very short curing periods and at normal vulcanizing temperatures through the use of powerful accelerators in the presence of small quantities of oxide of zinc. Although such rubbers may be undervulcanized when as much as 3½ per cent of sulphur is brought into combination through prolonged heating, good mechanical properties may be found in samples having abnormally low vulcanization coefficients when the vulcanization is carried out with minimum heating through the use of powerful accelerators.

(3) No definite figure can be established for the vulcanization coefficient of properly vulcanized soft rubber goods in general, or for the optimum cure of any mixing in particular, for the reason that the mechanical properties, as well as the chemical combination of sulphur is influenced by the time and degree of temperature used for vulcanizing.

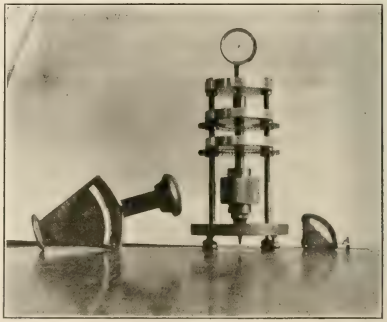
(4) It would appear probable, however, that in the case of any definite compound, the vulcanizing conditions could be standardized by the use of an accelerator, and that the degree of vulcanization could then be checked most accurately through determinations of the coefficient of vulcanization.

SOME METHODS OF TESTING THE HARDNESS OF VULCANIZED RUBBER.[1]

By H. P. Gurney.

USUAL QUALITATIVE METHODS.

The most natural way for an experienced rubber man to estimate the hardness of a piece of cured rubber is to note the force required to indent it with the point of a pencil or similarly convenient means. Although practical rubber workers are thus able to distinguish very accurately between different grades



Densimeter. Plastometer. Durometer.

of rubber coverings, the information acquired is of no value as a matter of record since it cannot be designated quantitatively.

QUANTITATIVE METHODS.

Spring Type Apparatus. The use of any of these different instruments for obtaining a figure expressing the hardness of rubber surfaces affords an accurate method for the comparison and recording of the quality of hardness by an arbitrarily chosen number.

In instruments of the spring type, the force is applied by means of a spring and the rubber is indented by a point of specified shape and dimensions.

The Durometer is an extremely convenient pocket instrument of this class. On its scale the hardness of glass or steel registers 100, while that of soft rubber good may register as low as 40.

At the Boston Belting Corp.'s factory, a so-called "Densimeter" has been in use for many years. This instrument is also of the spring type. A perfectly hard object has a densimeter reading of 1000, while softer objects may run as low as 250. There is one marked disadvantage in the use of the spring type of hard-

[1] Read before the Rubber Division of the American Chemical Society, at the Philadelphia meeting, September 2-6, 1919.

ness testers; namely, the existence of a noticeable variation in results due to the personal element.

Dead Weight Type Apparatus. The Plastometer is an instrument of this type in which the penetration by a steel ball, of ⅛ or ¼-inch diameter, under a load of one kilogram, is read in 1/100ths of a millimeter. Owing to the fact that the downward force of the indicating dial rod is 85 grams, the depression measured is not that due to an increase of load from 0 to 1000 grams but to an increase from 85 to 1085 grams.

In the practical use of this instrument, it is recommended by the makers that the readings be taken after one minute. The advisability of observing this time element is seen when it is noted that the initial reading is about 5 per cent lower than the reading found after the lapse of 60 seconds. The reading at 20 seconds is 2 per cent lower and that at 40 seconds 0.6 per cent lower than the reading at 60 seconds.

HARDNESS AND ITS RELATION TO THE MODULUS OF ELASTICITY.

In order to get an insight into the nature of hardness, it was arranged to measure the actual depression into rubber valve samples using both the ¼ and the ⅛-inch balls of the Plastometer. This was measured in terms of the volume displaced and the force of depression. Two samples were taken, one of 40 and the other of 110 plastometer.

When charted, we find that the force-depression volume plots are nearly straight lines and are approximately the same regardless of the size of the ball used. The fact that the reading on one instrument does not always correspond exactly with a certain reading on another, but holds true within certain limits only, is probably explained by the fact that the plots are not straight lines but are really slightly curved upward and at slightly different rates.

Hardness may be defined as the ratio of force to volume of depression and would have dimensions—

$$\frac{\text{Mass}}{(\text{Length})^2\ (\text{Time})^2}$$

The modulus of elasticity, which is sometimes used to measure the hardness of vulcanized rubber, is usually defined as the stress required to double the length of a rubber sample. It is so defined because the ratio of stress to strain is not uniform, although occasionally assumed as such for computation purposes, as with airplane shock absorbers.

The dimensions of the modulus of elasticity are—

$$\frac{\text{Mass}}{(\text{Length})\ (\text{Time})^2};$$

hence it varies from the dimensions of hardness by the inverse of the dimension of length.

The value of the use of an absolute or rational measure of hardness would not necessarily involve a different instrument for testing. The figures obtained with the present instruments could be expressed in terms of any convenient units, such as pounds per cubic inch, kilograms per cubic centimeter, or dynes per cubic centimeter.

The Runge Solution Process for Rubber Reclaiming.

Special Correspondence.

The Runge-Werke Aktiengesellschaft (Runge Works Corporation) in Spandau, which up to the beginning of 1917 was Max Fränkel and Runge, the largest German rubber reclaiming factory, has just made public some very interesting facts concerning reclaiming by the solution process.

ALKALI AND SOLUTION PROCESSES.

First, however, a few words about the German preparation of reclaimed rubbers. Among the many processes the most important at present are the so-called alkali process and the solution process. In the alkali process the fiber contents of the rubber waste are removed by being converted through the action of the alkali into a substance that is soluble in water, while the mass of rubber itself remains undissolved. In the solution process, on the contrary, the fibrous contents remain undissolved, while the mass of rubber is dissolved by the solvent employed, leaving a rubber solution from which, after reextracting the solvent, the mass of rubber is separated.

GERMAN RECLAIMED RUBBER CONSUMPTION.

The consumption of crude rubber in Germany in 1913 was over 20,000 tons. There are no statistics for the consumption of reclaimed rubbers; it was relatively small and may be estimated at something like 6,000 tons. A slight proportion of this German consumption of reclaimed rubber was made up of the rubber waste which was reclaimed in the rubber factories themselves and then made into rubber goods.

By far the greater part of the reclaimed rubber worked up in Germany in the peace period that preceded the war was imported from foreign countries, especially the United States and England. The chief reason for the slight consumption of reclaimed rubber in Germany before the war was that even in professional circles reclaimed rubbers were not looked upon as real rubber material, but only as substitutes which must be used only with the greatest possible secrecy.

RECLAIMING INDUSTRY STIMULATED BY THE WAR.

Conditions during the war gave for reclaimed rubbers a wholly different value, for after the blockade instituted by the English the war management very soon was compelled to make use of reclaimed rubbers to an extent which every person in the business would previously have thought impossible, and which was also not affected by the production of synthetic rubbers. What was impossible in peace times was learned from the war, namely, the extraordinary adaptability of reclaimed rubber to many purposes.

The German industries that worked in rubber learned that they must give full weight to the facts that reclaimed rubbers are already a mixture of rubber and additional materials, that they contain the rubber in a vulcanized form, and that the methods of treating them in manufacturing must be different from those employed with crude rubber.

PRODUCTION OF THE RUNGE WORKS.

The reclaimed rubber production of the Runge works, reached before the war the record amount of 1,850,750 pounds in 1912 and then dropped to 1,090,432 pounds in 1914.

In the ensuing war years the output developed as follows:

	Pounds.
1915	1,433,275
1916	1,692,552
1917	1,958,877
1918	2,142,577

In the course of the war nearly all German users of rubber became favorable to the products of the establishment, so that the total production of reclaimed rubber increased steadily in spite of the fact that in the course of the later years of the war the supplies of rubber waste became smaller and smaller and had led to rapidly increasing limitations on the general use of reclaimed rubber. In 1918 the reclaimed rubber production of the Runge works amounted to over two million pounds and the returns on account of the rise in prices were roughly $1,666,000. The firm, too, was greatly hampered at times in its production by prohibitions against the use of certain materials, for instance, by the Imperial Navy Office with regard to the solution reclaimed rubber for ocean cables, and so on. Nevertheless in the future course

of the war the Navy Department not only became the greatest user of solution reclaimed rubbers, but admitted their advantages without reservation.

NEW USES FOR SOLUTION RECLAIM.

This so-called solution process, a novel process for the utilization of rubber waste, the Runge works was the first to bring into use, not merely in Germany, but in the world. The process yields by-products which in turn make it possible to employ new methods of working in the manufacture of rubber products. The Runge firm had, even before the war broke out, obtained the patent rights for a series of processes which offer not merely the possibility but the probability of introducing revolutionary innovations in branches of industry which are remote from the rubber industry, and which before the war were not taken into consideration at all as users of rubber. The scarcity of rubber brought on by the war made it impossible to develop the possible applications of these productions of the firm. But in the coming days of peace the overproduction of the rubber plantations leads to the expectation of ample provision for the German rubber market, whether in the form of crude rubber or of rubber waste, while other industries will have to contend with a continuous marked deficiency in the raw material that must be imported from foreign lands.

The prospects for the solution reclaimed rubbers making good are much more favorable than they were before the war. The matter is one which affects especially the processes for the production of proofed fabrics, also linoleum-like flooring and other necessaries for the building trade. The textile and linoleum industries are precisely the branches of industry which in the approaching days of peace for Germany will have to suffer greatly from the lack of raw materials.

THE FUTURE OF RECLAIMED RUBBER.

In the opinion of the Runge works, Germany's consumption of reclaimed rubber in the coming peace time will be uncommonly great. If German economic experience with the employment of reclaimed rubber, acquired during the war, is fully utilized, the production of a given quantity of rubber goods will require only half as much raw rubber as in the peace period preceding the war, and the other half of the rubber will be supplied by reclaimed rubbers, while the excellence of the product need not be in any way inferior to that of the earlier peace goods.

A natural prerequisite is that not only must rubber waste not be exported, but it must also be imported. If for example, in the preceding peace time the largest German rubber goods factory exported to England 8,800,000 pounds weight of worn out automobile covers and received back in return 4,400,000 pounds of reclaimed rubber, such a procedure will hardly conform to the economic requirements of Germany.

It is the belief at the Runge works that in the future German economic life and the rubber reclaiming industry will have a marked development.

SOLUTION RECLAIMING PROCESSES.

There are many reclaiming solution processes, several being of other than German origin.

HEYL-DIA PROCESS (BRITISH). By this process ground rubber is heated under moderate pressure in naphtha at a temperature of not more than 120 degrees F. The naphtha is drawn off and with it most of the sulphur. The rubber is then heated to over 350 degrees F. with a fresh solvent, when it dissolves. The solvent is then removed and the sulphur washed and dried.

THE BASLE PROCESS (SWISS). This covers the use of various ethers boiling at a temperature of about 100 degrees C.

ZÜHL PROCESS (GERMAN). Vulcanized waste is dissolved in five times its weight of naphthalene at a low temperature. The naphthalene is then distilled from the mixture with steam.

KOENER'S PROCESS (GERMAN). Waste rubber is heated with solvents such as benzene for a time, after which the solution is further heated with water and the solvent subsequently distilled off.

DEBAUGE PROCESS (FRENCH). Tires are soaked for two or three days in xylol or other solvent, when the fabric can easily be stripped away from the rubber. The rubber attached to the fabric layers can be removed by a revolving wire brush, or by digestion in vacuum with boiling xylol. The rubber is ground while in the brittle, swollen condition produced by the solvent, and the latter recovered from the rubber and fabric by steam or dry distillation, in the latter case under reduced pressure. The solvent may also be removed by washing with acetone or alcohol.

O'NEILL PROCESS (AMERICAN). The caoutchouc is dissolved out from vulcanized waste rubber by treating the waste in a closed receptacle under about 60 pounds' pressure at a temperature below that determined to the rubber product (266 degrees F.) in the presence of boiling resin spirit. The solvent is removed from the dissolved and devulcanized rubber by vaporation. The product is said to have all the characteristics of the original rubber compound before vulcanization.

DE VILLERS PROCESS (FRENCH). Rubber-coated waste fabric is treated with boiling hot tetrachloride of ethane in two stages. The free sulphur is removed by a brief treatment and the solution of the rubber is accomplished by a second extraction with fresh solvent. After removing the fabric, the rubber is recovered from the solution by adding water and distilling off the solvent with water; or the solvent may be distilled dry, provided care be taken not to overheat the rubber.

COMPAGNIE GÉNÉRALE DES CAOUTCHOUCS DE TEREBENTHINE PROCESS (FRENCH, CANADIAN AND SWISS PATENTS). Rubber is recovered from rubbered fabrics by treatment with ethane tetrachloride, heating the fabrics during this treatment, filtering the resulting mass to remove the fabric, adding water to the filtrate and heating it to drive off the water and solvent.

GOLDMAN PROCESS (AMERICAN). Rubber stock is recovered from vulcanized rubber by bringing the latter in contact with a solution comprising resin and a material obtained by the action of dissolved resin on vulcanized rubber, and incorporating this solution with the comminuted vulcanized rubber and removing the solvent therefrom.

COX PROCESS (AMERICAN). Rubber stock is recovered from vulcanized rubber by treatment in a resin solution together with a solution of vulcanized gum in a resin solution.

PORZEL PROCESS (AMERICAN). Rubber waste is finely ground and mixed with a rubber solution in the proportion of 2½ to 3 pounds of new rubber to each hundred of old, the solvent being gasoline or carbon tetrachloride. The mass is reground, after which the solvent and any contained moisture are removed as far as possible, the temperature being kept below the vulcanizing point, employing a partial vacuum if necessary. Molding and vulcanization are affected with or without the addition of sulphur, which, when employed, is preferably dissolved in the rubber solvent.

HARRIS PROCESS (GERMAN). Ground rubber scrap is heated with a solvent such as chloroform, carbon tetrachloride, benzol, etc., the inorganic matter is separated and the solution is treated with hydrochloric acid, rubber hydrochloride is formed and is either filtered off directly or is precipitated with alcohol or chloroform in a vacuum. After washing with alcohol, ether, or chloroform the rubber hydrohalogenide is heated with pyridin under a reflux condenser for 12 to 50 hours and the dark solution is poured into water and the regenerated rubber separates. (German patents No. 267,277, November 28, 1912; No. 267,993, December 29, 1912; and No. 267,994, January 21, 1914.)

HUTZ PROCESS (GERMAN). This consists in reclaiming vulcanized rubber scrap by treating it with hydrochlorines or the intermediate products obtained by the action of muriatic acid on glycerine. (German patent No. 268,843, December 24, 1912.)

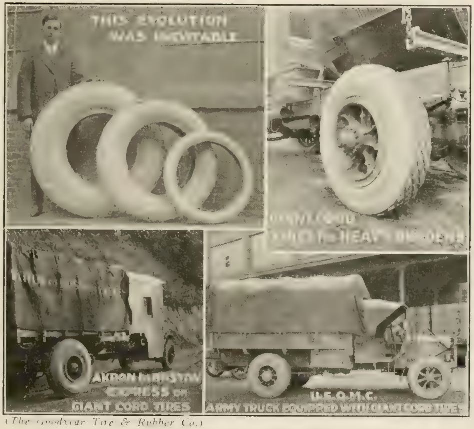
Giant Cord Tires for Motor Trucks.

In many respects the introduction of the motor truck has been not unlike that of the steam locomotive, some 90 years ago. When the locomotive was ushered into a wondering and incredulous world its sponsors entertained fanciful visions of its future importance while the "iron horse" was still little more than a giant toy. Road conditions prohibited its use. Then followed a period during which the steel track was perfected. First, the rails were of hardwood strips, then ribbons of iron were replaced on these wooden rails, next all-iron rails were substituted, and eventually the heavy steel rail of to-day.

The adaptation of the motor truck to present-day traffic uses has been accomplished by conquering just such trying conditions as those which confronted the locomotive promoters of nearly a century ago. Gasoline makes the giant truck go, but without a suitable "track"; namely, suitable tires, its commercial or industrial advantages remain quite limited.

The first motor trucks were fitted with solid rubber tires since at that time no other tires were available. But they were far from satisfactory for every purpose. Overloading was the common cause of failure, while their inability to negotiate bad roads set decided limits to their utility.

Interested manufacturers began at once to develop tires that would permit the motor truck to branch out into broader fields of service. The advantages of pneumatic had long been demonstrated on the passenger car and the plausibility of this equipment for the commercial truck was the first thing to be investigated.



(The Goodyear Tire & Rubber Co.)

A New Era for Pneumatic Cord Truck Tires.

SPECTACULAR INTRODUCTION OF PNEUMATICS.

In the early spring of 1917, just before the entrance of the United States into the war, a motor truck service was inaugurated over the 1400-mile, round-trip route between Boston and Akron on a regular schedule with pneumatic equipment, the object being to secure data for defining the distinctive fields of solid and pneumatic trucking in view of all conditions.

It thus occurred that the inhabitants along the Lincoln Highway through Pennsylvania looked up in surprise one day to see a large five-ton truck rolling along at touring-car speed, on eight and ten-inch pneumatic tires, actually beating the one-way express schedule, yet with such smoothness of motion that a spare operator could sleep as comfortably aboard as in an ordinary Pullman berth, if not more so. After several trips back and forth, three more long-distance trucks joined the pioneer to form an express fleet, running on regular schedule from Ohio to New England points, and people began to wonder whether this might portend a new era in modern freight transportation.

The experiment was fairly providential in relation to the war, when railroads were badly overburdened and when the motor truck had been called upon to save the nation from the peril of totally inadequate transportation facilities and to perform many feats to which they were wholly unaccustomed. Equipped with solid tires they had been pressed into service for hauling loads over long distances between cities, and even from the Middle West to the Atlantic seaboard.

Two important facts had been revealed to the Government through these experiences. First, that motor trucks on solid tires were largely limited in usefulness to hard surfaced roads, since these tires would slip and spin, or stall, in mud and ice and snow. Second, it was clear that the pounding of the solid-tired truck was damaging to every kind of road.

A prime end of the Akron-Boston experiment was to demonstrate to the United States Government that the giant pneumatic tire offered the opportunity for motor trucks to become vastly more useful than they ever could be on solid tires. It was shown over a period of two years on every type of road and through the snowy passes of the Alleghenies that pneumatic tires not only enabled trucks to negotiate snow and mud where solid-tired government trucks had stalled, but also that the pneumatic equipment meant a marked saving to the roads themselves. How well, has been attested by the rapidity with which the pneumatic tire was adopted by the government truck service and also by the public following upon that epoch-making trial. Thousands of private truckers hastened to adopt the new equipment, the economy and efficiency of which is confirmed by the continuous operation of the Akron-Boston service to the present day, two big trucks still handling rush shipments from Boston to Akron long after the railroad wartime shipping crisis has passed.

ADVANTAGES OF PNEUMATIC TRUCK TIRE EQUIPMENT.

Pneumatic tires on motor trucks save the load, the truck and the road, permit better time and therefore increase the amount of load that can be hauled in a given time. They have thus been a great aid in promoting universal use of the motor truck.

The country has been discussing the subject of the effect of heavy trucks on interurban pavements. Pneumatic tires on trucks work no harm to the roads, for they are built to distribute the load properly on the road surface. It is not primarily the weight of a truck that harms the road, but the bumping and pounding of the truck. With pneumatics this is eliminated, for the tire tread accommodates itself to the road surface and has no more harmful effect than a passenger automobile tire has.

DEVELOPMENT OF THE PNEUMATIC TRUCK TIRE.

While the establishment of the pioneer Akron to Boston express perhaps marks the turning point in the general adoption of pneumatic equipment on motor trucks, it was by no means new in 1917. In fact, the year 1908, nearly ten years earlier, marks the first efforts to develop a pneumatic tire suitable for truck service. The first tire produced was a 38 by 6 size of fabric construction. In 1908, 1909 and 1910, quite a few of these tires were applied to fire apparatus where the need for pneumatic cushion seemed most necessary. These early tires were quite satisfactory on fire trucks where the runs were short and the service was not continuous.

Starting with the six-inch tire in 1908, tires of seven, eight, nine, ten and twelve-inch sections were developed within the next few years. All of these tires were of fabric construction. As in the case of the early six-inch fire-truck tires these other sizes did fairly well in the fabric construction for short hauls and intermittent service. But when they were used for long hauls and under severe conditions, it was found that the intense heat generated caused the tires of fabric construction to disintegrate too quickly.

LARGE CORD CONSTRUCTION.

Now came an improvement of scarcely less significance than the adoption itself of the pneumatic tire. The principle of cord construction developed steadily through the years and was made practical for the more powerful gasoline passenger cars. The progress made in this direction pointed to the possible solution of the problem of pneumatic tires for trucks.

Finally the development of the cord tire was merged with the pneumatic truck tire in 1916 and the cord pneumatic truck tire was produced. This tire stripped away the limitations of the fabric type and made possible the use of pneumatics in the most severe service possible, as proved in the 1500-mile round trip between Akron and Boston.

Since the introduction of the pneumatic cord truck tire in 1916, and its thorough demonstration in 1917, the use of pneumatics has expanded rapidly. All tire manufacturers have adopted as standard the final sizes developed in 1914, including the 36 by 6, 38 by 7, 40 by 8, 42 by 9, and 44 by 10.

Thus, through some eleven years of development work, there has been provided for the truck industry and the public an improvement which bids fair to revolutionize motor truck transportation throughout the world. The cord tire has demonstrated that its great cushion and traction will enable the motor truck to do things heretofore impossible on solid tires. It is opening up new fields of usefulness for the motor truck and well informed men now look for a more rapid development in the truck industry than we have had in passenger cars, now that trucks can enjoy the same tire advantages that passenger automobiles have had.

PEACE PROBLEMS AND PROGRESS.

THRIFT CLUBS IN RUBBER FACTORIES.

America has made tremendous strides in thrift during the four years in a continuance and increase in the practice of consistent savings is what the country needs above all else to bridge the present crisis, pay the nation's debts, and bring high prices down. Reckless spending by the individual is the greatest danger confronting the United States to-day. Hard work, common sense economy, wise buying and systematic saving on the part of everybody are required to avert national disaster and convert our war liabilities into peace assets.

To this end the Treasury Department is engaged in a great campaign to spread the gospel of saving and safe investment through the increased sale of Thrift and War Savings Stamps and Treasury Savings Certificates. It is asking employers of labor everywhere to encourage the organization of War Savings Societies and will also cooperate with manufacturers' representatives in forming organizations for accident prevention to be known as Accident Thrift Clubs, the two purposes often being served by a single organization. Organizers are being sent into factories to help select officers, provide program material, furnish the initial stimulus and arrange systematic savings schemes for employes according to their incomes. This salutary movement is making headway in many rubber factories, and firms wishing to institute it among their own operatives should communicate with the Savings Division, War Loan Organization, United States Treasury Department, Washington, District of Columbia.

A NATIONAL THRIFT WEEK.

The Savings Division of the United States Treasury Department has announced plans for a National Thrift Week beginning January 17, 1920. The purpose of the week will be the endeavor to start the country off in the New Year with a sound financial program for every individual and household. Two ends are sought; first, that the condition of the individual be improved, and second, that the financial and industrial strength of the nation be increased by the great sums of capital which will accrue through the practice of steady saving and safe investment on the part of citizens. The program for National Thrift Week, as at present tentatively planned, is as follows:

National Thrift Day, Saturday, January 17, 1920.—To enlist the Nation in a campaign to "Save first and spend afterwards," making the present insure the future by regular saving to finance future opportunities or needs, and investments, preferably in loss-proof government securities.

Thrift Sunday, Sunday, January 18.—Sermons in all American pulpits on the relation of economic life to religious well-being, and the need of sharing with others.

National Life Insurance Day, Monday, January 19.—To emphasize the importance of protecting one's family with life insurance.

Own-Your-Own-Home Day, Tuesday, January 20.—To show why desirable and how possible to own a home.

Make-a-Will Day, Wednesday, January 21.—To urge men to make wills, and in so doing impress upon them the necessity of making provision for the future.

Thrift-in-Industry Day, Thursday, January 22.—To emphasize the need for factory thrift, and the economic value of cooperation between capital and labor.

Family Budget Day, Friday, January 23.—To show the importance of using the budget plan in family finance.

Pay-Your-Bills Day, Saturday, January 24.—To emphasize the moral obligation to pay debts.

Manufacturers of rubber goods and employers of labor in all allied lines can benefit themselves as well as the whole country and their operatives by cooperation in inculcating these principles in thrift, and by the sale of Savings Stamps and Treasury Savings Certificates through their offices. Investigation would probably show a large number of persons who would gladly take a definite percentage of their weekly salaries or wages in these interest-bearing Government securities.

CENSUS FOR MANUFACTURERS.

The schedules to be used in tabulating information for the approaching Fourteenth Decennial Census of the industrial resources of the United States will be mailed to every manufacturing establishment in the country during the month of December so that factory owners and managers can familiarize themselves in advance with the questions to be answered when the records of business for the calendar year 1919 have been compiled.

In addition to the general schedule a supplemental schedule will be sent to the 68 principal industries as classified by the Census Bureau. This supplemental schedule will allow detailed statistics of output to be set forth under the heading "products manufactured." All information gathered is strictly confidential and is to be used for general statistical purposes only.

Rubber Factory Foremanship.

By James Wright Cary.

A foreman is one whose acquaintance with a business, competence in directing workmen and handling detail, warrants a superintendent in placing him in charge of a department. Where the "line control" method was followed he had a wide range of responsibilities, such as hiring and discharging workmen, O-K-ing time tickets, placing orders in process, obtaining supplies for his department, controlling wage rates paid to the men under him, and repairing machinery. In the circumstances it was perhaps natural that he should believe he knew his job better than anyone else, and he probably did. He was jealous of his authority, prerogatives and so-called "rights"; was intolerant of outside suggestion, a foe to changes and improvements unless recommended by himself; paternal and dictatorial toward his men; knew, or thought he knew how each phase of the work should be done; intended to be, and was consulted constantly as a matter of necessity, there being no one else; and at the same time was strangely unconscious of a well-developed "blind spot," one indication of which was his persistent refusal to train an "understudy."

Later, when meetings between the superintendent and the foremen became a regular feature of the organization, he sat in with considerable reluctance, and discussed the subjects under consideration, or offered suggestions for improvements in his own department just in proportion as he possessed an open mind, or was conscious of the necessity for, or ambitious to see improvements.

This type of foreman has held his own well down to the present, and belongs to what may be called the "old school." To him, the new ideas that began, little by little, to filter through the cracks in old line organization were things genuinely disturbing. He thought the old way was a good way, and in many respects it was. He knew that the management had depended upon him in a hundred ways, and had trusted his judgment and fidelity, his acumen, foresight and force. He had worked up from the bench, probably in surroundings inconvenient and unsanitary as compared with present-day equipment; had seen his department expand from a few men to a hundred or more, and new machinery take the place of old. He knew the whole story, and his fiber was interwoven in every line, and his personality impressed on the product from his department. He was genuinely attached to the shop, and in particular to his department, and was regarded as a successful foreman.

When the shop was small he was pretty generally informed as to the whole lay-out, but as the business grew he was more and more confined by his duties, and his time and energies were absorbed by them. The natural consequence was that the detail of other departments escaped him, and very gradually but surely he became detached from them. He was a capable mill-room or other foreman, but he knew little about spewing machines, tire building machines, presswork, shoe-making, or vulcanizing. He could handle men, but knew little of costs, up-keep or scientific management. He was simply a spoke in the big wheel, but as such was very competent, and in taking off my hat to him I wave him farewell, for this particular type of factory executive is passing. The forward-looking factory management will demand and secure foremen of a different type, better equipped. Like the old, they will be dependable, forceful, systematic. Like a trained chemist they must be able to analyze many things. The new system will require them to be specialists in more than one direction.

An expert shoemaker under present practice may be selected for inspector, and then it is but a step to the position of foreman. Or a cost clerk, as a reward for success, may be placed over the tire makers.

What to do with the old foreman? It will depend on what the laboratory terms his "elastic limit." In other words, can he absorb new ideas and develop accordingly? Can he match the new pace and keep up with it? The new method proposes to give him every opportunity and encouragement to do so. The chief difficulty will be found probably in his attitude of mind. If he is ossified in the belief that his is the one best way; if at heart he is opposed to changes; if he balks and uses his influence to create and maintain hostility among employes, then he will have to make room for the man who can meet the new proposals with an open mind and the paramount desire to be of the greatest possible benefit in the organization.

The new method begins with the scientific selection of men. Not that the old way was a failure, but the new way will require more from a foreman at the start and secure corresponding results from him afterward. He must have all the good points demanded under the old régime, plus a lot more.

Is there such a thing as scientific selection of the man? Undoubtedly. You do not pick a plow horse for a racer, nor does the crow displace the carrier pigeon for carrying messages from the battlefield. Consequently there must be a type of man who possesses inherent qualities capable of development along lines that will make him a factory executive, beginning with foremanship. In the search for this exceptional man, however, the very first thing to be assured of is the physical basis. This is a feature of profound significance. Suppose you find a man who qualifies intellectually, and you school him and coach him and spend a lot of good money to equip him for the exacting duties of the position ahead, and just at the time he is ready to qualify he goes to smash with a bad lung; or, in the midst of a strenuous campaign where he is called upon for every ounce of his personal equipment, he becomes a nervous wreck.

Is, therefore, the possession of a fortunate combination of brain and brawn essential to successful foremanship? Absolutely. Having picked your man physically, the point next in order for investigation is intellect. Intimately associated therewith is a man's schooling. He may have been a star quarterback, or able to bat a ball to the bleachers, but if he "fell down" in his studies while in school, you do not want him. There will, of course, be exceptions, but as a rule the man who showed no aptitude nor ambition in securing the rudiments of an education, will, as a sequence, not have received that mental development essential to enable him to "carry on" in the particular field under discussion. The better the mental equipment, the better are the chances for successful foremanship.

Having picked a man with brain and brawn, the third essential is temperament. Given a man with physique and mental equipment, it does not follow that, tossed in a blanket, he will land on his feet. He may be temperamentally unfitted for foremanship. He may lack that vital essential, control of men. He may have no "head" for detail, and a lot of other things.

It is but fair at this point to give the psychologist an opportunity to "show him up." Some doubt his value. Many a superintendent prefers to trust to what he calls his "judgment" of men; he can "size them up." This faculty has been termed the "sixth sense," but is after all, really psychology. But psychological or not, it is certainly good sense to take into account a man's bearing, his facial angle, his voice, eyes, walk, and especially any eccentricity that may distinguish him from the ordinary run of men. These in sum make up for you a replica of the man himself, and enable you to determine whether he is worth taking a chance on. For, taking it by and large, it is more or less of a gamble whether results will justify your choice.

It facilitates matters to chart your man. Make up a list of the qualities you wish a foreman to possess. Professional psychologists follow this method. Dr. Blackford thinks an executive should possess a "keen sense of justice, courtesy, dependableness (constancy, reliability, uniform disposition), courage, love, teachableness (ability to learn even from the lowest worker), openness of mind, tactfulness, sympathy (ability to appreciate the other man's position), understanding of human nature." William Kent would have him possess, "education and special knowledge, industry, aggressiveness, health, energy, initiative, tact, personality." Frederick W. Taylor would have chosen men with "brains, honesty, education, judgment or common sense, tact, technical or special knowledge, manual dexterity or strength, energy, grit, good health."

It is singular that these "authorities" should not more closely agree as to the elements that predominate in the 100 per cent man. Here are afforded, however, suggestions sufficient to aid in the creation of a chart for guidance, whereon to note impressions of the men selected for foremen, or for any other position. Naturally you will have these charts frequently before you, "keeping tabs," correcting first impressions, probably, and finally obtaining an accurate record of each man in whom you have a special interest.

You have, let us assume, a dozen men selected from among the foremen of as many different departments, and also a dozen "green" men picked from the ranks of whom you conceive as possessing abilities worth your time and money to develop. All these men have been under observation for some time, and to them you have confided your aim. The chances are the foremen know little about the factory outside their departments, and the new men are getting their first real acquaintance with rubber goods manufacture.

With the selection of these men enters your responsibility to train them so well that within a reasonable time they will be equipped to demonstrate in a practical way the value of the method you have employed. There are, doubtless, divergencies of opinion as to the details of such training, but the fundamentals are easily discernible. First, a basic knowledge of rubber; sources; methods used in its gathering or production in forest or plantation; its chemistry, inspection and selection. Second, manipulation and preparation for use in manufacture. This will carry the student through washing, drying, compounding, mixing, calendering, and include the preparation and use of fabrics. This knowledge must be acquired by personal contact with the work. The student should manipulate the compounds and understand why they are employed. He should work as one of a "crew" at every preparatory process, and should be coached and catechized frequently that there may be no question that he is acquiring a practical working knowledge. This he can demonstrate very readily by giving in writing the detail of each step in each process he observes. Furthermore, he should be encouraged in a critical attitude toward machinery, methods, appliances, and personnel, and to suggest betterments. This method will surely show whether a student has the critical faculty, constructive imagination, and practical ideas, all of which are essential to the equipment of the man who would qualify for foremanship. Having mastered basic details, the student should next acquire a working acquaintance with individual processes. He should learn to run a spewing machine, a jar-ring cutter, a sole cutter, a vulcanizer. He should learn how to make automobile casings, and tubes, hose, belting, shoes, and packing. In short, he should acquire a practical knowledge of how all of the goods produced by the factory in which he is employed are made.

As to the time required to complete such a course of study, it naturally depends on the man. Much could be accomplished in three months by intelligently directed, concentrated work. It is just as well to remember first, that men are being trained for executive factory positions in your factory, men to whom great responsibility will be entrusted, not for one year, but for many years, and that you can well afford all the time necessary to gain this end; second, that there is bound to be a noticeable difference between these men in their quality, capacity, and ultimate value, and that a successful course of training must be based upon this. He would be a foolish tailor who tried to fit all men with one size of suit; he, per force, has several sizes, or he does little business. Why not have a series of study courses to which individuals will automatically adapt themselves? For example, the first lesson series would cover the study and manipulation of crude rubber, compounding ingredients and fabrics, the machinery required, and the manufacturing processes involved, supplemented by reading such works as "Crude Rubber and Compounding Ingredients," "Rubber Machinery," etc. Also lectures should be delivered before students by the master mechanic and the chief chemist. This series should be quickly disposed of, depending much on the skill with which you have picked your men. By this time you will have gained a better acquaintance with them and may have reason to believe there are some whose capacity for knowledge has reached the "saturation point."

Have prepared a second series for those who are fortunate enough to "carry on." This will include the study and practice of job analysis as applied to machinery, methods, men, and factory conditions; time study of manufacturing operations with a view to suggesting piece-work rates, which may be checked against those in force, simply for the education of the students. Incidental readings would cover such authors as Taylor, Gannt, Gilbreth, Emerson, Thompson, Knoeppel, Diemer, and others; also the current magazines devoted to manufacturing and kindred subjects. Lectures should be provided related to the general scheme, such as factory construction and equipment, chemistry of india rubber, production and use of power, machinery and tools, management of a work force, wages, etc.

A few words regarding job analysis and time study seem pertinent here. It must not be supposed that anything of a superficial nature will suffice to fit a student to make a proper job analysis, any more than holding a stop-watch on a factory operation constitutes time study. Much of the disastrous record in the past is directly chargeable to lack of proper preparation in these two lines. Job analysis requires a combination of trained observation coupled with good, practical ideas. Efficiency in making a time study cannot be acquired in a day or a week, even if intelligently directed, and it is open to question whether there is in the average factory organization any written standard practice worthy the name, giving detailed instruction of how a student should be trained for this work. It is no part of this discussion to devise a curriculum covering these subjects, but to point out that the average man has few qualifications for dealing with them. If, therefore, you are fortunate enough to bring forward all members of the school into the second series, by this time you may find some who have reached their intellectual limit, or at least do not show that capacity for assimilating knowledge that will warrant introducing them into a third series. Those who were found to have serious limitations need not necessarily be classed as failures, for each takes automatically, as one might say, his position in the scholastic gage-glass, according to his specific gravity.

There remain for further schooling the top-notchers from whom may be properly expected the highest returns. These men should give special attention to factory organization and management, interdepartmental relations, planning, routing, costs, waste, power, standardization, welfare, betterments, and so on, to the end that they may become foremen in name, but in reality, assistants to the superintendent. In sum, you will have secured men who know the manufacturing of rubber goods thoroughly, and are specialists in the lines made in your factory. They have worked with the factory rank and file to the point where they will be a credit to your organization.

LONG-STAPLE AMERICAN-EGYPTIAN COTTON.

Long-staple cotton of the American-Egyptian type needs, as conditions for successful production, an unusually long growing season, freedom from boll weevil and an assured supply of water for irrigation, Dwight B. Heard told the Cotton Conference that met in New Orleans in October.

The production in 1918 was 38,246 bales of 500 pounds each of long-staple cotton, 34,300 of which were grown in the Salt River valley of Arizona, 1,200 each in the Gila valley and in the California Imperial valley and smaller quantities in the Colorado valley in Arizona and the San Joaquin and Palo Verde valleys in California. Besides this, the Imperial valley produced 35,000 bales of short-staple and 5,000 bales of Durango cotton and the Yuma valley 20,000 bales. The short-staple product this year will probably be 10,000 bales larger, while the long-staple Pima crop will be over 50,000 bales.

A Field of American-Egyptian Cotton.

This crop was of exceptional interest to spinners and to the manufacturers of choice cotton goods because the new Pima cotton was quite as desirable as Egyptian Sakellarides and could be spun into equally fine counts. In 1918, on an ordinary run of 2,112 bales at the gin of the Tempe Exchange, at Tempe, Arizona, under government classification and supervision, the grade and percentage of this lot of Pima cotton ran as follows:

Grades.	Per Cent.	Staples.	Per Cent.
No. 1 or fancy	14	1 11/16 to 1¾	61
No. 2 or extra	52		
No. 3 or choice	17	1⅝ to 1-11/16	37
No. 4 or Standard	9	1½ to 1 9/16	2
No. 5 or medium	7		

In 1919 the percentage of cotton running 1-11/16 and 1¾ was larger than in 1918. The remarkable success in the Salt River valley, where 95 per cent of the Pima cotton produced in America will be grown this season, is largely due to the scientific care with which this industry has been developed. One feature is the fact that but one type of American-Egyptian cotton, Pima, is grown throughout the entire district and all danger of crossing with inferior seed is avoided. Of the total area of 275,000 acres now under intensive cultivation by irrigation in this district, 88,000 acres, or 32 per cent. of the entire acreage, is planted in Pima; a percentage which can be readily maintained.

The growers realize that the immunity of the Salt River valley from the boll weevil and other pests which have handicapped the cotton industry in other sections must be maintained, and with the cooperation of the Government the best methods not only to prevent the importation of seed in which there could be any danger of infection, but to maintain the highest standard in the selection of the local seed, have been practiced. The cotton plant is essentially a sunshine plant, and there is probably no section of the world except Egypt where the sun shines with more regularity than in the Salt River valley.

This year 88,000 acres in the Salt River valley alone are planted. The land has been more carefully selected than before and it is not unreasonable to assume that from 45,000 to 50,000 bales of Pima cotton will be produced. In the Florence and Casa Grande valleys, including the Sacaton Indian Agency, southwest of Phoenix, this year's production will probably equal 2,500 bales, while in the Yuma and Parker valleys, along the Colorado River, and in certain sections of the San Joaquin valley in California 1,500 to 2,000 additional bales of Pima cotton can be expected, making a total production for this season of from 50,000 to 55,000 bales. In the Salt River valley there should be for sale this year from 20,000 to 25,000 bales of unmortgaged cotton.

It is significant that last season the total production of Pima cotton equaled the production of Sea Island cotton. The total manufacture in the United States of long-staple cotton, either Old-World Egyptian or Sea Island cotton in the five years previous to our entry into the war, was 275,340 bales annually, of which 78,650 400-pound bales was Sea Island.

With the increase this year of the production of Pima American-Egyptian cotton to approximately 50,000 bales, while there are only 15,000 bales of Sea Island cotton, it is manifest that the Pima cotton has become a very material factor in the long-staple market.

MEADE COTTON A SUBSTITUTE FOR SEA ISLAND.

Disheartened, and hopeless of the recovery of Sea Island cotton from the continued invasion of the boll weevil, the United States Department of Agriculture recommends the substitution of Meade cotton, developed by the Bureau of Plant Industry.

Meade cotton is a new upland long-staple variety, which is the nearest approach so far to Sea Island cotton in length and fineness of fiber and is recommended particularly to planters in the West Indian islands. It is named after the investigator of the Bureau of Plant Industry who was improving the variety when he died. It now produces lint averaging 1⅝ inches in length with unusually uniform fibers. The seeds are large and yield a high percentage of oil, about 24 per cent. They are slightly tufted at the ends like the seeds of Sea Island and Egyptian cotton, so that it is possible to use for this cotton the roller gins employed for Sea Island cotton.

In 1917 Meade cotton was picked two weeks ahead of Sea Island. It yielded twice as much, 230 pounds compared with 117 pounds, and it was easier to pick because the bolls are twice as large as Sea Island bolls. The lint ranges between 1⅝ and 1=11/16 inches, has good luster, a slightly heavier body than Sea Island and is scarcely distinguishable from it when properly ginned. It should be treated in the same manner and as carefully as Sea Island.

Venezuela's chief imports, among which were rubber articles and duck, were transported mainly by parcel post during the years 1917 and 1918.

Interesting Letters from Our Readers.

ANALYSIS OF THE COVERINGS OF A ZEPPELIN.

To the Editor:

Dear Sir:—The external covering (of a Zeppelin) was made of a tissue that was colored grayish blue at the top and black at the bottom. The gray blue was obtained by printing with indanthrene blue by means of a roller engraved with very fine lines as though for a border of calico. The tissue covered with its varnishes weighed 146 grams a square meter.

Treated with hot tetrachlorethone it loses its varnish of cellulose acetate which dissolves; with the varnish gone the tissue preserves its coloring, therefore it was printed before varnishing. The composition of the tissue per square meter was:

	Grams.
Printed cloth	113.8
Cellulose acetate	32.6

The prime material of the tissue was cotton in very fine threads. The lower portion was wholly black. It weighed 127.60 grams per square meter. Treated with solvents it yielded (1) Cellulose acetate, (2) Japanese black varnish.

After the black varnish was removed it showed a blue-gray coloring like that of the tissue of the upper portion. The black varnishing seems to have been put on after the balloon had been constructed, in order to make it less visible. The composition of the tissue, per square meter was:

	Grams.
Printed tissue	86.80
Cellulose acetate	31.9
Black varnish	7.

The tissues contained no trace of rubber varnish. The covering of the interior small balloons intended to hold the hydrogen was made of a thin silk tissue, covered with a varnish formed of:

(1) Factices of chloride of sulphur that could be extracted with alcoholic potash. (2) A fat varnish of linseed oil. (3) A varnish with a base of coumarone or of bakelite soluble in alcohol.

On this tissue were glued by means of a varnish of cellulose acetate two layers of gold-beater's skin. These gold-beater's skins were covered with a supple layer of cellulose acetate with a base of furfurol. The composition of the tissue was as follows:

	Grams.
Weight of whole tissue per sq. meter	180.
Weight of varnished tissue	103.
Weight of varnished gold-beater's skin	77.
Weight of silk tissue	84.1
Various varnishes of tissue	18.9
Pure gold-beater's skin	65.1
Varnish of gold-beater's skin	11.9
Total weight of varnishes	30.

This wrapper bore no trace of rubber.

André Dubosc.

Paris, France, November 20, 1917.

PHILIPPINE GUTTA AND THE BRITISH.

To the Editor:

Dear Sir:—I understand from the newspapers that the gutta percha in the Philippine Islands is owned by the British. That we Americans are practically frozen out and cannot cover our own cables without English consent. Is not this another case of unwarranted British aggression?

John McCormick.

San Francisco, California.

(The newspapers are wrong. Philippine gutta belongs to the Filipinos, is gathered and marketed by them The middlemen are Chinese who ship it to Singapore, grade and sell it. If you desire to lay a cable you can buy gutta in the Philippines if the Chinese do not get it first. If you do not plan cable construction but are simply working up a racial grudge better thrash a Chinaman. Don't hit an Englishman; first, because he is not at fault and second, because he is liable to hit back.—The Editor.)

A BIT OF CHARLES GOODYEAR HISTORY.

To the Editor:

Dear Sir:—I wonder if you know that a man lives at the Congress Hotel in Chicago who was at one time quite intimately connected with Charles Goodyear? He is Mr. I. S. Deutsch, whose father bought the Goodyear estate at Burrville, Connecticut.

As a boy, Mr. Deutsch ran across a great variety of experimental curios left by Charles Goodyear. Later, Mr. Deutsch married one of the daughters of the late J. M. Brunswick, the pioneer of the Brunswick-Balke-Collender Co., and here again he was brought into contact with india rubber. For example, Mr. Bensinger, another son-in-law of Mr. Brunswick, was closely associated with Dr. B. F. Goodrich, and it is said that it was he who exerted strong influence in inducing Dr. Goodrich to go to Akron. As Mr. Deutsch remembers it, Dr. Goodrich's intention at first was to confine his factory output to hard rubber. He, however, later went into mechanical rubber goods and a general line, some of which were made on patents owned by Dr. Goodrich and Mr. Bensinger.

Strange to relate, Mr. Bensinger was one of the first to suggest the amalgamation of canvas with rubber to get additional resiliency and durability, essentially the same construction as is now used for the manufacture of tires.

W. C. Jenkins.

Chicago, Illinois.

(Bits of history of this sort are exceedingly interesting as they give valuable sidelights on matters that are oftentimes either forgotten or misunderstood. It is the writer's impression, however, that the hard rubber business which Dr. Goodrich took up came about long after druggists' sundries and mechanical goods had been installed and successfully manufactured. It may be true that Mr. Bensinger first suggested the amalgamation of canvas with rubber in Akron, but such use had been made in other manufactories for thirty or forty years, and indeed, dates back to 1820, to be exact, when it was used in England. In fact, it antedates the discovery of vulcanization. This statement of course is not made to minimize in any way the work that either Mr. Bensinger or Dr. Goodrich did, as the great company that was built up through the pioneer efforts of these men speaks for itself.—The Editor.)

RUBBER IN SLICKERS.

To the Editor:

Dear Sir:—In the so-called slicker as made to-day, is rubber used? Also, was it used in the old-time slicker of forty years ago?

John E. Reynolds.

Rockport, Massachusetts.

(The slicker as made to-day contains no rubber. It depends upon specially prepared oil for its waterproof qualities.

Years ago, however, rubber was used in making the old fashioned Cape Ann slickers. One of the prominent manufacturers forty years ago was Levi Nicholson of Swampscott. They were also made far down on Cape Cod and by Cummings & Howes at Orleans. They went out of business 35 years ago. The recipe used was:

1 gallon linseed oil.
1 gill Pratt's zinc dryer.
1½ ounces red Pará rubber.
Lampblack dissolved in turpentine to color.

One successful manufacturer treated the oiled surface with a sour milk wash with good results, an acid cure through the use of lactic acid.—The Editor.)

What the Rubber Chemists Are Doing.

By P. Schidrowitz and H. A. Goldsborough.

STUDIES IN VULCANIZATION.

THE RUBBER STRESS-STRAIN CURVE.

The authors have published the first of a series of papers* in which they purpose to carry out their deferred plan to discuss their studies in vulcanization. The leading features of their paper on the rubber stress-strain curve and determination of "correct cure" are given below, necessarily somewhat condensed.

NATURE OF STRESS-STRAIN CURVE.

E. Hatschek and H. A. Goldsborough examined the practicability of obtaining a single expression for the stress-strain curves of a series of cures of the same mixing. (The mixing employed in the fundamental experiments consisted of 100 parts of rubber to eight of sulphur, cured for periods varying from 15 to 405 minutes at 286 degrees F. in molds in live steam).

As bearing on the mathematical nature of "type," it is desirable to restate, briefly, the following characteristics of progressive cures of the same rubber-sulphur mixing, as first set forth by Schidrowitz:

1. The process of vulcanization is physically and mechanically of a definitely progressive character, and its progress can be accurately and graphically represented by a series of stress-strain curves.

2. The state of cure of a given mixing of any rubber at any given time (assuming standard conditions) is graphically expressed by the form and position of the corresponding stress-strain curves representing progressive cures which bear a certain mathematical relationship to each other for any one rubber, and a relationship exists between the series of curves representing progressive cures of any one rubber and the series of cures representing progressive cures of any other rubber.

3. As curing proceeds the curves come farther down the paper in regular fashion and do not intersect at any point.

4. At a part of the curve not far from the point of inflection the curves become parallel to each other. That is to say, the rate of stretch decreases with increasing loads, and is independent of the state of cure. The above characteristics for a single set of cures may be readily gathered from Figure 1.

Examination of the curves showed that they belong to the conchoid family, and it was found that a conchoid corresponding closely to the rubber curve could be expressed, referred to Cartesian coordinates as follows:

$$y = a + b \sin \alpha.$$
$$x = n\,(a \,.\, \cot \alpha - b \cos .\, \alpha)$$

The rubber curve is derived from the parent conchoid by plotting the ordinates against a constant fraction (n) of the corresponding abscissa, as expressed in the above equations.

The interpretation of the terms in the above expressions may be obtained from the following considerations:

(1.) a represents the distance between the pole of the curve and the asymptote.

(2.) n is a constant in the expression $x = (nx')$ in which x is the load at any point on the stress-strain curve and x' is a corresponding point on the parent conchoid.

(3.) $a.n$ is a constant for any given set of curves.

(4.) n represents the increase of stretch per increment of load, or in other words slope or "type."

(5.) Hence a/n or $1/n$ is the degree of stretch or distensibility.

(6.) It follows that a represents a quality which is the inverse of stretch capacity, namely, toughness or tenacity.

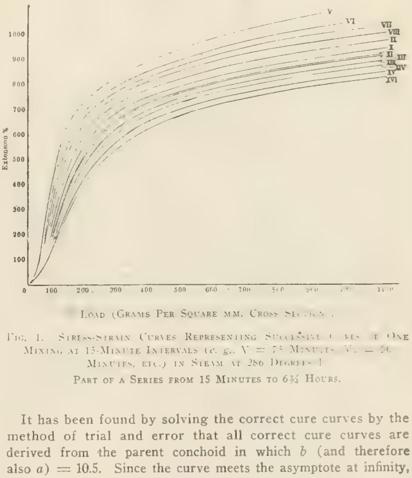
*"Journal of the Society of Chemical Industry," September 15, 1919, page 347T.

(7.) b represents the limits of extension.

In every set of curves (progressive cures of the same mixing) there must be a specific curve in which $a = b$. It follows that this specific curve represents a theoretically ideal balance of properties. The curve in question is the one we term the correct or perfect cure.

It is remarkable that $a.n$ (*i. e.*, slope or type), which obviously represents a fundamentally important quality of a rubber, is a constant for any rubber, theoretically from the point of inflection upwards and actually, as found experimentally, from a point not far removed from the latter.

Expressed in other terms, this means that after the initial stage of stretching, equal increments of load produce equal elongations, whatever the state of cure.



Load (Grams Per Square mm. Cross Section).

Fig. 1. Stress-Strain Curves Representing Successive Cures of One Mixing at 15-Minute Intervals (e. g., V = 75 Minutes, VI = 90 Minutes, etc.) in Steam at 286 Degrees F.

Part of a Series from 15 Minutes to 6¾ Hours.

It has been found by solving the correct cure curves by the method of trial and error that all correct cure curves are derived from the parent conchoid in which b (and therefore also a) $= 10.5$. Since the curve meets the asymptote at infinity, it follows that we are justified in concluding that all correct cures of a standard mixing consisting of 100 parts of rubber to eight parts of sulphur (whatever the nature of the rubber, provided it is *Hevea*) meet at a point for which the coordinates are $y = 10.5$, $x = oc$; that is, an extension of 11.5 times the original length is the limit of distensibility.

METHOD OF DETERMINING "CORRECT CURE."

From the above it will readily be inferred that to obtain the correct cure it is necessary to determine a, b and n. In other words, it is essential to determine (1) type and (2) the particular curve in any set in which $a = b$.

TYPE.

In practice the determination of $a.n$ ("type") by means of the expressions corresponding to the coordinates is obviously inconvenient. Taking advantage of the fact that "type" represents increase of stretch per increment of load, we determine the

property by measuring the increase in elongation corresponding to two suitable points on the load coordinate as follows:

$$\text{Type (Conventional)} = \frac{E_1 - E}{2.5}$$

Where E = extension per cent at 600 grams per square millimeter and E_1 is that at 1040 grams.

The extensions corresponding to the loads stated for various types for the correct cure in each case were found to be as follows:

TABLE I

Types 33 to 45.

"Correct" cure extensions at 600 grams and 1,040 grams per square millimeter (mixing 100 of rubber to 8 of sulphur)

Type	Extension, Per Cent. 600 Grams per Sq. mm. (E)	1040 Grams per Sq. mm. (E_1)	E_1 - E
33	826†	908*	82
34	815	900	85
35	805	892	87
36	794	884	90
37	783	875	92
38	772	867	95
39	761	859	98
40	750	850	100
41	740	842	102
42	729	834	105
43	718	825	107
44	707	817	110
45	697	809	112

† 9.26 Times original length.
* 10.08 Times original length.

A glance at the above table and Figure 2 will reveal the fact which is of fundamental importance, namely, that the lower (or better) the type figure (*i. e.*, the more rapid the decrease in extension with increasing tension towards the end of the curve), the less rapid is the decrease in the initial portion. In other words, a curve representing a rubber A which is flatter in type than rubber B, will lie for the whole of its course above the latter at the correct cure (*i. e.*, where $a = b$). As confirmation in this connection it is interesting to note that de Vries and Hollendorn§, in a paper from the Central Station at Buitenzorg (which has adopted our method of determining "type"), found that "the maximum of tensile strength is found higher on the paper the flatter (smaller) the 'slope,' that is, the better type or quality as determined by this property." These authors found a range of variation in different grades of plantation rubbers of 36 to 53.

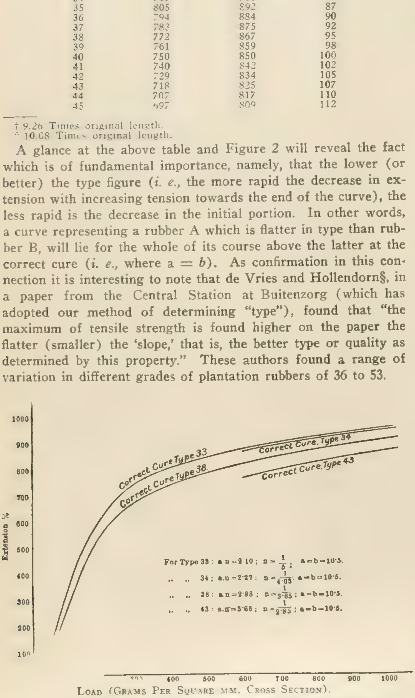


FIG. 2. STRESS-STRAIN CURVES REPRESENTING CORRECT CURES FOR TYPES 33, 34, 38 and 43

The same authors in a previous paper|| found that "the permanent set for one standard state of cure shows a close relationship with the property called 'type.' by Schidrowitz. . . . As the 'type' in ordinary routine testing of raw rubber can be determined in the same operation as tensile strength, a separate test for permanent set, when using the above-named mixture of rubber and sulphur only, is superfluous for ordinary samples. Only in the case of rubber prepared by special methods a deviation from the above given relationship may occur and lead to important conclusions."

A consideration of the above will demonstrate the fallacy of measuring the quality of a rubber by the resistance to stretch method, which consists in determining the load necessary to produce a given extension at a single point, and assumes that the greater the load the better the rubber. For rubbers of different "types," the reverse is actually the case. Further, it is obvious that the application of this method for determining state of cure, as suggested ¶, may give fallacious results.

NON-VARIATION OF TYPE.

The authors have demonstrated that the constancy of *a.n* or "type" is not subject to variation by experimental conditions, citing particularly variations in curing time; mixing by different operators and machines; curing in different vulcanizers; method of heating; overworking the rubber mixing and variations of "rest" or "storage" after mixing.

THE CORRECT CURE.

We have shown that the curve in any series of cures which we select as the "correct" cure possesses certain attributes which represent (theoretically) an ideal balance of properties. It is the curve in which *a-b*, that is to say, the toughness or tenacity equals the limit of extension. It is obvious that for purposes of comparative evaluation of crude rubber, a certain definite curing standard must be selected.

There is a great and undeniable advantage in a method which not only indicates quite clearly which curve represents the "correct" or standard cure, but which in addition, in the case of a cure which is not correct, indicates quite clearly what the correct cure should be.

Some examples are given below of "correct cures" obtained on the basis of a single preliminary cure. The rubbers consisted of various plantation grades (smoked sheet, pale crêpe, brown crêpe, and scrap). Some rubbers of an experimental type are also included.

EXAMPLES OF "CORRECT CURES," OBTAINED ON BASIS OF ONE PRELIMINARY CURE.

(Preliminary Cure in Each Case = 2 Hours, Except Where Otherwise Stated.)

Number.	Preliminary Cure. Figures. B. S.	E.	Time.	"Correct Cure." Figures. B. S.	E.
P.	1,592	9.95	1 hr.	1,786	10.03
M.	1,288	9.86	2½ hrs.	1,554	9.85
F.	1,521	10.94	3 hrs.	1,850	10.28
F. 1	581	10.78	4 hrs.	1,960	10.68
F. 2	798	10.46	3½ hrs.	1,260	10.12
F. 3	840	10.35	3½ hrs.	1,094	10.08
N.	1,484	11.34	2½ hrs.	1,515	10.72
F. 4	1,219	11.00	3 hrs. 5"	1,886	10.40
F. 5	1,204	11.00	3 hrs.	1,313	9.82
31 A. VIII	2,380	9.81	1½ hrs.	2,345	10.50
31 S. VII	1,341	9.33	1½ hrs.	1,554	9.86
36 S. VII	1,198	11.2	2½ hrs.	1,642	10.57
77 S. XI	476	10.0	3½ hrs.	1,700	10,40
79 S. XI	460	9.58	3¼ hrs.	1,850	10.50
C. 48	1,660	10.2	1¾ hrs.	1,900	10,40
38 S. X	1,262	10.48	3 hrs.	1,579	10.20
W. 332 (3 h.)	2,058	9.27	2 hrs.	1,947	10.30
W. 333 (3 h.)	1,730	9.62	2¾ hrs.	1,770	10.10
W. 336 (3 h.)	2,072	9.64	2¼ hrs.	2,188	10.53
W. 338 (3 h.)	2,184	10.20	2½ hrs.	2,000	10.85
842a (2¼ h)	2,083	9.54	1¼ hrs.	2,160	10.75
841a (1¼ h.)	1,960	10.30	1 hr.	2.016	10.68
W. 344 (2½ h.)	1,477	9.8	3¼ hrs.	1,540	9.55
W. 352 (3¼ h.)	2,140	9.95	2½ hrs.	1,880	10.45
W. 354 (2¼ h.)	1,568	10.80	2¾ hrs.	1,946	10.36

Note.—B.S = Breaking strain (lb. per sq. inch). E. = Elongation at breaking (taking original length = 1).

CHEMICAL PATENTS.

THE UNITED STATES.

ELASTIC COMPOSITION comprising coarse rubber and a composition consisting of long-fibered cotton and high-grade rubber friction and skim; an alkaline earth; an oxide of one of the

§ "Journal of the Society of Chemical Industry," 1917, page 1261.
|| "Journal of the Society of Chemical Industry," 1917, page 1261.
¶ Kratz and Flower. THE INDIA RUBBER WORLD, June 1, 1919, page 485.

true metals and a vulcanizing constituent. (Bela W. Rote, assigner to L. J. Weadock, both of Elyria, Ohio. United States patent No. 1,318,804.)

METHOD OF MANUFACTURING TIRE TUBES of layers of Japanese paper pasted together, coated with alcohol solution of resin and shellac and finished with a thick solution of india rubber on both the inner and outer surfaces. (Etsutario Ikeda, Tokio, Japan. United States patent No. 1,319,003.)

PLASTIC MASS RESEMBLING SOFT RUBBER OR LEATHER AND PROCESS, consisting in treating yeast with formaldehyde and subjecting the product resulting to the combined action of heat and pressure. (Ernst Krause, Steglitz, and Haus Blücher, Leipzig-Gohlis, Germany, assigners by mesne assignments, to the Chemical Foundation, Inc., New York City. United States patent No. 1,319,666.) (See German patent No. 314,728 granted to Hans Blücher, Leipzig.)

LEATHER SUBSTITUTE AND PROCESS OF MANUFACTURE. Sheets of fibres are saturated with a solution of a binding agent, dried and compressed, coated with rubber containing a vulcanizing agent and cured under heat and pressure. (Roland B. Respess, New York. United States patent No. 1,319,795.)

COMPOSITE SHEET MATERIAL consisting of a fibrous sheet impregnated with an oxidizing oil, textile fabric superimposed on one surface thereof, and a layer of elastic adhesive material uniting the fibrous sheet and fabric. (Alexis W. Keen and Pietro Frigeri, New York City, assigners to Rubber Regenerating Co., Naugatuck, Connecticut. United States patent No. 1,320,149.)

PROCESS FOR VULCANIZING RUBBER AND PRODUCTS OBTAINED thereby. A process for treating rubber or similar material which comprises subjecting the rubber to an organic dye adapted to produce oxygen and inducing vulcanization to take place under the action of said oxygen. (Iwan Ostromislensky, Petrograd, Russia, assignor, by mesne assignments, to New York Belting & Packing Co., New York City. United States patent No. 1,320,166.)

THE DOMINION OF CANADA.

RUBBER VULCANIZING PROCESS which comprises mixing dinitrobenzene and red lead with rubber or similar materials and vulcanizing the mixture. The patent also includes the vulcanized products of the action of red lead and dinitrobenzene. (The Canadian Consolidated Rubber Co., Limited, Montreal, Que., Canada, assignee of Sheldon P. Thacher, Weehawken, New Jersey. U. S. A. Canadian patent No. 193,394.)

THE UNITED KINGDOM.

COATING MATERIALS FOR FABRICS, ETC. Turkish birdlime is thinned with alcohol and used for rendering porous materials impervious, especially for making petrol tanks from porous materials such as canvas or from a material such as rubber, which is attacked by petrol. The birdlime is preferably treated with hot solution of borax or with hot water, then heated to 180 degrees F. and mixed gradually with the alcohol. To vary the consistency, diatomaceous earth shellac, or dextrine may be added. (C. A. Brackenside, Woburn Sands, Bedfordshire, and Gayner Pneumatic Co., 95 Cannon Street, London, British patent No. 130,379.)

OTHER CHEMICAL PATENTS.

GERMANY.

PATENTS ISSUED, WITH DATE OF APPLICATION.

NO. 1,319,032. Producing rubber soles for boots and shoes. M. H. Kurt Blitz, Neukirchen.

313,554. (August, 1917.) Process for reclaiming rubber. Dr. Wm. North and Hermann Looski, Hanover.

314,503. (September 21, 1917.) Process for reclaiming rubber shavings. Adolf Vorweck, Jr., Bremen.

314,560. (February 25, 1915.) Process for producing rubber-like hard and soft rubber. H. Otto Traun's Research Laboratory, Hamburg.

314,728 (November 20, 1915.) Process for making substances like soft rubber or leather out of yeast and formaldehyde. Hans Blücher, Leipzig.

315,321. (January 23, 1918.) Process for making highly elastic vulcanized substances out of synthetic rubber. Mitteldeutsche German fabrik. Louis Peter, Frankfort.

THE FRENCH REPUBLIC.

493,450. Process for making synthetic rubber. H. Jousse.

493,569. Process for making ebonite. R. C. M. Bayard de la Vingtrie.

493,634. Improvements in vulcanizing rubber and like substances. The Dunlop Rubber Co., Limited.

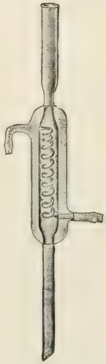
494,757. Process for removing the combined sulphur from vulcanized rubber. D. Spence.

495,013. Process for vulcanizing rubber objects. American Rubber Co.

LABORATORY APPARATUS.

AN EFFICIENT CONDENSER.

The Kobe Condenser has three sets of walls. The water for cooling enters through the upper side tube, thence it passes through the coiled inner tube and out by the lower side tube. The distillate enters the adapter at the top, passes through the expanded middle tube and out by the tube at the bottom.


THE KOBE CONDENSER.

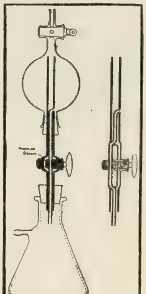
While in the apparatus the distiller is cooled in three ways; first, by the expansion of the middle tube; second, by the jacket of cold water around it; and third, by the cold tube coiled inside it.

A Kobe condenser of this type, with body six inches long, is as efficient as a regular Liebig condenser 35 to 40 inches long. It is especially recommended for liquids of low boiling points. (Eimer and Amend, Third avenue, 18th to 19th streets, New York City.)

PRESSURE-EQUALIZING STOP-COCK.

The special pressure-equalizing stop cock shown in the illustration was designed for use in connection with a generator for carbon dioxide which was to be used alternately with pressures below and above that of the atmosphere. In this new apparatus the connection is made by means of an annular groove in the key of the stop-cock so that there is always communication between the lower flask and that of the upper one.

One arm of the stop-cock is extended until it opens above the liquid in the upper container. The liquid enters at an aperture in the lower part of this opening. Two different styles were made using the same principle in each. ("The Journal of Industrial and Engineering Chemistry.")


STOP-COCK FOR EQUALIZING PRESSURE.

IMHOFF SEDIMENTATION TUBE.

IMHOFF TUBE.

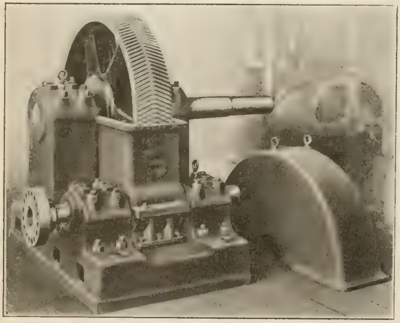
The Imhoff sedimentation tube for determining sediment in water and other liquids is shown in the accompanying illustration. It has a capacity of one liter graduated or divided as follows: up to 2 cc. in one-tenth cc.'s; from 2 to 5 cc. in one-half cc.'s and from 5 cc. to 4 cc. in single cc.'s. (Eimer & Amend, Third avenue, 18 to 19th streets, New York.)

New Machines and Appliances.

HERRINGBONE REDUCING GEAR DRIVES.

Complete drive units consisting of a pair of herringbone gears and pinions enclosed in an oil-tight case for reducing the speed of an electric motor to mills or calenders are necessary equipment in every rubber mill. The accompanying illustration of a vertical calender drive shows the reducing gear commonly used to connect 66-inch calenders with 100 h.p. 950 r.p.m. motors.

The gears are made of furnace-annealed steel castings, the pinions, of hammered open-hearth steel forgings, are made integral with the pinion shaft, and the shafts are of open-hearth steel forgings. The low speed, or gear bearings are cast integral with the main frame and fitted with removable split shells of cast steel, babbitted. High speed, or pinion bearings consist of babbitted pillow blocks bolted to the frame. For rebabbitting or other repairs the pinion bearings may be readily taken down and the shells easily removed from the gear bearings. Genuine babbitt, or such other high-grade bearing metal as is most suitable, is used in all bearings. All bearings have oil ring lubrication, the oil being supplied by separate reservoirs below the gear and pinion shafts. Oil for lubrication of the



Vertical Type Calender Drive.

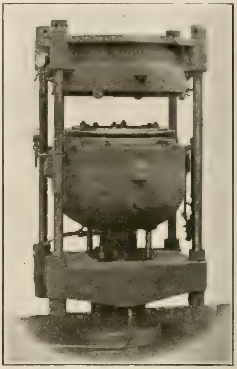
gears is kept separate from that in the bearing reservoirs by throwers and retainers on the gear and pinion shafts.

The main frames are made of iron castings of heavy section and proper dimensions to obtain rigidity. They are machined to carry the gear and pinion bearings in correct alinement, and are provided with foundation bolt holes of proper size.

Gear covers for all drives are entirely separate from the main frames, and form an oil reservoir for lubricating the gears. They are made of cast iron split horizontally in the center line of the gear and pinion shafts, and are machined and fitted together to obtain oil tightness. Covers are attached to the main frame in proper position by means of machine bolts. Oil gages, oil drains, also inspection and oil supply openings, are provided. (Fawcus Machine Co., Pittsburgh, Pennsylvania.)

HYDRAULIC BICYCLE TIRE PRESS.

The use of the formerly plebian bicycle is said to be rapidly increasing in popularity and in consequence bicycle tire makers are planning to increase materially their future production. However that may be, the accompanying illustration of a British press-vulcanizer, with its novel features is of more than passing interest.



Bicycle Tire Press Vulcanizer.

The press is made in two sizes for 26 and 28 inch bicycle tires. It is operated by two rams one of which closes the press and at the same time the other automatically expands the collapsible core which is made in eight segments. The loose tread ring for forming the pattern of the tire is not shown in the picture, but is fitted to the columns and is easily changed to enable the same side rings and core to be used with varying tread rings to produce any desired patterns. The time of vulcanization varies from five to seven minutes. (Francis Shaw & Co., Limited, Manchester, England.)

SOLID WOODEN SHELLS.

The wooden shell formerly universally used in rubber factories was built in two pieces held together by glue and dowels reinforced at the ends with flat iron rings held in place by screws. Such shells frequently fell apart and have been practically superseded by metal shells.

Wood Calender Shell.

Solid wooden shells turned and bored from one piece and reinforced against splitting by special cast rings sunk deeply into the ends, are made for the rubber manufacturing trade and other industries. They may be used either with wooden or metal center bars and are found very satisfactory. (Adolph Martin Sons, Inc., Passaic, New Jersey.)

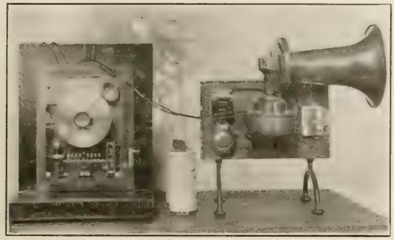
A NOVEL FACTORY SIGNAL.

The Klaxocator is an electrical code calling mechanism which will signal either audibly with horns, bells or whistles, or by electric lamps placed at any number of points throughout a factory. Its operation is entirely automatic after it has been set for a given code number by the operator.

While it is used chiefly for summoning officials, department heads and production foremen to the nearest telephone, it may be utilized for fire alarms, danger warnings, as an extension to telephone bells in noisy places, for signals between departments, for sounding the time of beginning and stopping work, or giving warning that power, light or water is to be cut off.

These code signals are sounded simultaneously at as many points as signal stations are installed, or shown by lights, ac-

cording to the character of equipment. Horns used with the device are similar to the well known electric auto horns and vary in shape according to whether it is desired to scatter the sound, to intensify it in a horizontal direction, or to deflect it downward. The horns are connected to an available 110 or



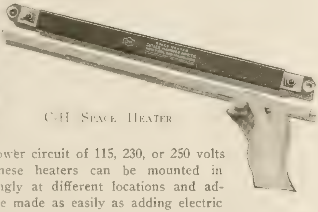
The Klaxocator.

220-volt circuit, either direct or alternating current, while only a small current from a few dry cells is used in the central instrument.

When it is desired to call some person, the operator sets the desired person's code number on the dial and pulls a lever. The contact shaft is set in motion instantly by the spring and the circuit is closed a certain number of times in accordance with the position of the code drum. Every time the battery circuit is closed the relay closes the power circuit and operates all the horns, whistles, gongs and lamps connected to it. Having sounded the complete call three times, the number indicator returns to its original position and the mechanism is ready for the next call. Numbers may be sounded as many as three times if desired. (The Klaxon Co., 1 Madison avenue, New York City.)

ELECTRIC SPACE HEATERS.

This is a steel-jacketed heater of special design intended for heating crane cabs, out houses, valve, pump and meter houses. In rubber mills there are undoubtedly many places where this device can be used to advantage in winter weather.

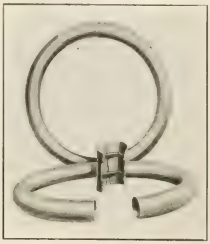


C-H Space Heater

Each heater has a capacity of 500 watts and may be connected to any direct or alternating current lighting or power circuit of 115, 230, or 250 volts pressure. These heaters can be mounted in groups or singly at different locations and additions may be made as easily as adding electric lamps. The heaters are flat like an ordinary ruler, the thickness being 3/16-inch, the width 1½ inches, and the length 24 inches. (The Cutler-Hammer Manufacturing Co., Milwaukee, Wisconsin.)

CIRCULAR MANDRELS FOR CURING INNER TUBES.

The principal advantages claimed for inner tubes that are cured on circular mandrels are that they conform to the shape in which they are used in the casings, meaning a more uniform thickness in the volume of rubber used and resulting in a tube of much better lasting quality.



Circular Tube Curing Mandrels.

The illustration shows a popular type of a circular tube-curing mandrel before the tube is applied, and the spring-controlled section explains how the mandrel is made practically endless.

These mandrels are made in all sizes, from 3 to 12 inches in section, the 6-inch size and larger being particularly advantageous, due to their comparative lightness. (The Republic Tool & Manufacturing Co., Cleveland, Ohio.)

MACHINERY PATENTS.

MACHINE FOR APPLYING RUBBER CEMENT.

This machine applies cement in a semi-automatic manner to rubber clothing, gas masks and other articles made of rubber.

A front elevation of the machine, partly in section, is shown in Fig. 1 and comprises a frame and table similar to an ordinary sewing machine. An endless belt *A* runs over a bridge *B*, provided with a depression or groove in its upper surface, and detachably resting on the privoted angular pieces *C, C*, which may be swung away from the belt pulleys as indicated by the dotted lines on the left.

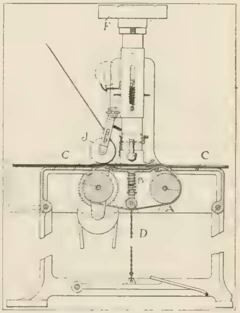


Fig. 1. Elevation Partly in Section at Right Angle to the Plane of Fig. 2.

Chain *D* is connected to a treadle at the base of the machine, and passing through the angular arm, connects with the pivoted lever *E* (See Fig. 2) that bears against the bottom of the cement receptacle *F*, which is fastened to the cement chute *G*, sliding within an outer tube that is forced away from the angular arm by a powerful spring *H*. Thus, when the treadle is depressed the cement chute is raised and by spring action is forced away from the belt *A* to the position shown in Fig. 2.

In applying cement to objects of irregular outlines such as gas masks, the object is placed under a cam-shaped pattern and when revolved, the cam follower attached to the cement chute evenly distributes the cement. For straight seams the cement chute is used in combination with the belt *A* as shown in Fig. 3. In applying cement to endless objects such as cuffs of rain coats the angular pieces *C, C*, are swung out of place and the object to be cemented is slipped laterally over the belt *A* (See Fig. 1). When cement is to be applied to adjacent overlapping edges of two objects, the fabric is forced into the depression in the bridge *B* by the cement chute, forming an angular configuration, so that both of the overlapping edges are cemented in an equal manner. (See Fig. 1.)

In order to cement pieces of fabric together, the tape shown in Fig. 1 is led from a reel to a roller *J*, that applies the tape

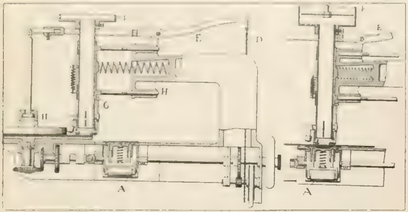


FIG. 2. SIDE ELEVATION. FIG. 3. DETAIL OF SIDE ELEVATION.

to the cemented fabric in passing. (Hirsh Milkewitz, Louis Gelacie and Saul Gelaru, New York, N. Y., United States patent No. 1,318,683.) Patent No. 1,318,661 granted to the same inventors covers features in the same machine.

OTHER MACHINERY PATENTS.

THE UNITED STATES.

NO. 1,317,848. Press for retreading tires. J. J. Wohlgemuth, Chicago, Illinois.

1,317,849. Press for molding and vulcanizing tires. J. J. Wohlgemuth and L. L. Korach, Chicago, Ill.; said Korach assignor to said Wohlgemuth.

1,317,850. Tire mold. J. J. Wohlgemuth, Chicago, Ill.

1,317.904. Tire mold. F. E. Anderson and D. S. Erickson, Osage, Kans.; said Anderson assignor to said Erickson.

1,318.113. Combined testing and inflating gage for tires. H. A. Scott, Berkeley, Calif.

1,318,273. Apparatus for vulcanizing tires. F. D. Goodlake, Memphis, Tenn.

1,318,383. Retreading apparatus. W. H. Hermsdorf, assignor to S. H. Goldberg—both of Chicago, Ill.

1,318,530. Tire-retreading mold. J. Bjurstrom, St. Paul, Minn.

1,318.643. Apparatus and method for rolling tire bead cores. J. L. Butler, Akron, O., assignor to The B. F. Goodrich Co., New York City.

1,318.661. Machine for cementing garments. S. Gelarie, H. Milkewitz and L. Gelarie—all of New York City.

1,318,685. Tire-banding machine. H. I. Morris, San Diego, Calif.

1,319,088. Air-bag for tire repairing. A. L. Johnson, Worcester, Mass.

1,319,287. Tool for trimming solid rubber tires. G. H. Johnson, Los Angeles, Calif

1,319,301. Machine for slicing tread stock from tires. E. Nall, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

1,319,333. Stitching apparatus for tire-making machinery. W. B. Harsel, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

1,319.338. Machine for buffing inner tubes, etc., C. D. Hibbs, Fort Worth, Tex.

1,319,887. Apparatus and process for making hose by impregnating tubular fabric with balata solution. C. R. Griffith, Portland, Ore.

1,319.644. Core for tires. G. H. Chinnock, New York City.

1,319.695. Machine for making cord tires. F. B. Converse, Akron, O., assignor to The B. F. Goodrich Co., New York City.

1,319,770. Expansible core for vulcanizing tires. A. Hargraves, Akron, O. (Application renewed August 8, 1919.)

1,319,982. Wrapping machine. C. R. Wieczoreck, Union Hill, N. J., assignor to Peerless Rubber Manufacturing Co., 1790 Broadway, New York City.

1,320,015. Sectional mold for tires. H. V. Lough, assignor to The Hartford Rubber Works Co.—both of Hartford, Conn.

1,320,021. Machine for forming tire molds. W. A. S. Mauk, Baltimore, Md.

1,320,128. Rubber mixer. B. J. Felix, Chicago, Ill.

1,320,295. Machine for making tire carcasses. W. C. Tyler, Racine, Wis., assignor to The Goodyear Tire & Rubber Co., Akron, O.

1,320,319. Tire-building machine. J. J. Convery, New York City, assignor to Kelly-Springfield Tire Co., Akron, O.

1,320,334. Machine for calendering vulcanite bases for solid rubber tires, C. Macbeth and H. Willshaw, Birmingham, assignors to The Dunlop Rubber Co., Limited, Westminster, London—both in England.

THE DOMINION OF CANADA.

193,091 Machine for winding balls. The Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, assignee of H. Z. Cobb, Winchester, Mass., U. S. A.

193,179. Apparatus for making tire casings. E. Hopkinson, 1790 Broadway, New York City, U. S. A.

193,356. Spreader for tire valves. H. P. Kraft, Ridgewood, N. J., U. S. A.

THE UNITED KINGDOM.

130,440. Apparatus for applying tread to foundation band of solid tire. Dunlop Rubber Co., 14 Regent street, Westminster, and C. Macbeth, Pará Mills, Aston Cross, Birmingham.

130,459. Sectional mold for tires. E. Hopkinson, 1790 Broadway, New York City, U. S. A.

131,311. Apparatus for shaping tire covers. E. Hopkinson, 1790 Broadway, New York City, U. S. A.

131,407. Device for opening tire molds and carrying tires on cores out of contact with shells after separation. Dunlop Rubber Co., 14 Regent street, Westminster, and C. Macbeth, Pará Mills, Aston Cross, Birmingham.

131,737. Machine for attaching two-section heels to boots, one section being rubber, etc. British United Shoe Machinery Co., Union Works, Belgrave Road, Leicester. (United Shoe Machinery Co., 205 Lincoln street, Boston, Mass., U. S. A.)

131,760. Apparatus for simultaneously forming tires of different diameters. Dunlop Rubber Co., 14 Regent street, Westminster, and C. Macbeth, Pará Mills, Aston Cross, Birmingham.

GERMANY.

308,622. Press for belting and similar materials. Oskar Skaller, Berlin.

314,148. Mechanism for attaching treads to tires. Lorenz Klingler, Nürnberg.

317,144. Press to mold plastic masses Edmund Muller, Hemeling, Bremen.

PROCESS PATENTS.

THE UNITED STATES.

NO. 1,319,032. Producing rubber soles for boots and shoes, M. H. Clark, Hastings-on-Hudson, N. Y., assignor to Boston Rubber Shoe Co., Malden, Mass. (Continuation of application Serial No. 878,935, filed December 24, 1914.)

1,319,575. Rebuilding tires by combining, adding new material, vulcanizing, etc. W. D. Druse, Farmington, Mo.

1,320,121. Tire manufacture. F. F. Brucker, assignor to The Miller Rubber Co.—both of Akron, O.

THE DOMINION OF CANADA.

193,150 Waterproofing garments after seaming. W. S. Barker, Cambridge, Mass., U. S. A.

THE UNITED KINGDOM.

129,298. Securing porcelain and similar fittings to rubber articles such as necks of water bottles, etc. A. B. V. and H. F. Taffs, trading as H. F. Taffs & Co., 46 Farringdon street, London.

130,168. Manufacture of tire casings. E. Hopkinson, 1790 Broadway, New York City, U. S. A.

130,578. Manufacture of tennis balls. A. G. Spalding & Bros., 126 Nassau street, New York City, assignees of A. T. Saunders, Chicopee, Mass.—both in U. S. A. (Not yet accepted.)

130,615. Manufacture of tennis and similar balls. Tokasago Gomu Taabuskiki Sawais ha. 1000 Oh-Aza Zoshigaya, Takata-Mura Kitatoshima-Gun, Tokio. (Not yet accepted.)

131,416. Application of labels to silk neckwear, etc., by rubbber cement, heat, etc.

THE FRENCH REPUBLIC.

490,742. Improvements in the manufacture of tire casings. E. Hopkinson, 1790 Broadway, New York City, U. S. A.

20,816/491,352. First certificate of addition to patent dated December 9, 1915, for process and apparatus for inhaling and absorbing volatile products, fumes, and noxious gases. R. Bataille.

AUSTRALIA.

To Americans.

9,887. Vulcanizing rubber half-sole to fabric reinforcing strip to permit attaching toboots or shoes by stitching without liability of pulling out. F. A. Nolan, Minnesota, U. S. A.

GERMANY.

307,173. (February 21, 1917.) Process for making textiles impregnated with rubber. Wilhelm Deutsch, Vienna. (Austrian patent.)

308,277. (October 20, 1915.) Process for repairing rubber tires. Ludwig Victora, Heusenstamm in Hesse.

312,009. (March 18, 1916.) Process for making tires and preventing skidding. Karl Racher, Seebach, bei Villach (Austrian patent of December 1, 1915.)

313,281. (May 9, 1918.) Process for laying on rubber. Wilhelm Sachs, Berlin.

315,342. (December 20, 1918.) Process for giving a smooth surface to objects made from reclaimed rubber. Marie, widow Richter, born Haasmann, Dresden.

RUBBER EXPORTS FROM LONDON, ENGLAND, TO THE UNITED STATES from January to July, 1919, aggregated $9,280,243, as compared with $3,732,799 for the first seven months of 1918. The increase of rubber exports is particularly noticeable.

New Goods and Specialties.

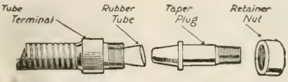
THE "HOLD-NO-FONE."

Every now and then some inventive mind develops a new form of telephone. While the principles involved are the same, as far as the transmission and receipt of messages are concerned, the outer form of the equipment may vary widely. The one here illustrated obviates the necessity for using the hands in any way in operating the device, once the connection has been made. A flexible horn is placed directly over the receiver, fastened by a spring. The receiver, with horn attached, is fastened to the telephone post and adjusted for either ear. The ear-piece is fitted with a soft rubber cushion, and a small weight fastened to the receiver hook makes and breaks connection when placed in position, leaving the hands entirely free for writing, holding papers, etc. At the same time the rubber ear-piece shuts out interfering local sounds. This device has been patented in the United States, the last patent having been granted during the present year. (Hold-No-Fone Co., 295 Fifth avenue, New York City.)

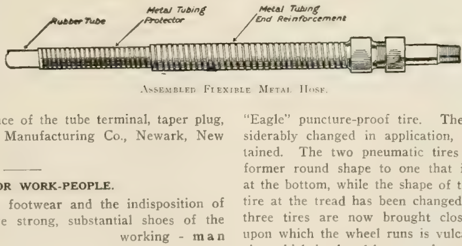
Telephoning with Free Hands.

"FLE-X-MET" TUBING.

The disadvantages of using rubber tubing protected by only a comparatively thin covering of silk, cotton, or other material easily punctured or burned, resulted in the development of the tube or hose proteced by metal, necessarily in flexible form. One of the more recent styles is shown in the accompanying illustrations, which indicate, in addition to the flexible metal covering, the appearance of the tube terminal, taper plug, and retainer nut. (Breeze Manufacturing Co., Newark, New Jersey.)



A. T. F. "Fle-x-Met" Air Hose



Assembled Flexible Metal Hose.

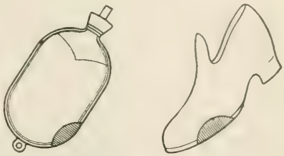
A SHOE FOR WORK-PEOPLE.

The high price of leather footwear and the indisposition of shoe manufacturers to make strong, substantial shoes of the working-man type, have given rubber footwear manufacturers an opportunity to provide for the class that needs serviceable yet inexpensive footwear. The "Craftsman" shoe shown here is made with uppers of extra strong duck, in either white or brown, with the seams reinforced with leather. It has a rubber heel, a sole of red fiber and rubber, a liberal foxing, and a special insole. Such a shoe gives comfort and service at a price low enough to bring it within reach of mechanics and other workers. It is made both high and low cut, and in men's and women's styles in all sizes, the smaller with spring heels. (La Crosse Rubber Mills Co., La Crosse, Wisconsin.)

The "Craftsman" Shoe.

"REPAIRO" SELF VULCANIZING PATCH.

A new rubber patch, which can be used by the amateur in mending articles of rubber or leather, is represented herewith. The patch is cut to fit over the hole and is applied by means of the "Repairo" self-vulcanizing solution accompanying the outfit, after the surface of the article to be repaired has been roughened around the break or hole with sandpaper. (The Repairo Co., 39 West Adams street, Chicago, Illinois.)



The "Repairo" Patch.

"DUXRANE" FOR AUTOMOBILE TOPS.

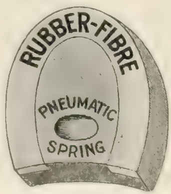
A new material for automobile tops is called "Duxrane." It is made of single-ply rubberized fabric and will, it is claimed, stand the test of scrubbing, wrinkling, and rubbing, without sagging, cracking, or fading. The coating is extra heavy, which contributes to its beauty. (O'Bannon Corp., 200 Fifth avenue, New York City.)

"EAGLE" PUNCTURE-PROOF TIRE.

In The India Rubber World for April 1, 1919, on page 369, appeared an illustrated description of a wheel equipped with the "Eagle" puncture-proof tire. The design has since been considerably changed in application, but the theory has been retained. The two pneumatic tires have been altered from the former round shape to one that is round on top and pointed at the bottom, while the shape of the bottom of the solid rubber tire at the tread has been changed to fit the newer design. All three tires are now brought closer together. The solid tire upon which the wheel runs is vulcanized to a demountable steel rim, which is placed between the solid and the pneumatic tires. (The Eagle Puncture-Proof Tire Co., Inc., 1662 Broadway, New York City.)

THE "NEVER-LOOSEN" HEEL.

One of the newest heels is of solid rubber with a pneumatic suction space in the side applied to the shoe and a non-slip plug in the bottom. The unique feature of the "Never-Loosen" heel consists of a rand of fiber and rubber vulcanized to the heel when manufactured. By means of this rand the heel can be properly held in place



Jones "Never-Loosen" Heel.

by nailing, without cement or washers. (Jones Never-Loosen Rubber Heel Corp., 13 Park Row, New York City.)

FOR HOLIDAY TRAVEL.

A woman traveling in the holidays desires a toilet case as dainty as the home visited. For such the accompanying picture shows a silk outer case, plaided in pleasing colors, which contains a removable rubber-lined easel with pockets to accommodate the toilet accessories. These include comb and brush, tooth brush, cold and dental creams, face cloth and soap, sandpaper strips, orange-wood stick, nail brush, powder puff in powder box with mirror inside, a convenient mirror with easel back, and a paper of hair pins. The flaps on the pockets have loops of silk cord and the case itself fastens with loops over crystal buttons. There is a suitable hand strap for carrying, and a loop on the lining case by which that may be withdrawn from the outer one.

Plaid Traveling Case.

PURSE-LIKE TOBACCO CONTAINER.

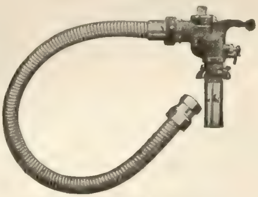
The container for tobacco and cigarette papers, shown in the photograph, is lined with rubber to preserve the natural moisture of the tobacco which may be within. There is a small pocket to accommodate cigarette papers, and the whole folds together like a purse and is held by a strap and snap fasteners. The case may be had in black fine-grained seal or tan pigskin, black cobra seal, or brown pin seal. It is five and one-half by four inches in size. Initials may be stamped above the fastener if desired.

New Tobacco Pouch.

Both the cases are from the same house. (Mark Cross Co., 404 Fifth avenue, New York City.)

AUTOMATIC BARREL FILLER.

Garage men and others handling lubricating and other kinds of oil find a barrel filler a great convenience. One that is also automatic should meet with additional favor. That represented here includes the automatic feature and is fitted with three and one-half feet of metal-lined hose one and one-quarter inches in diameter. The automatic barrel filler may be had in larger and smaller sizes by those who desire, equipped with different lengths of hose. Fittings that are suitable for attaching the hose to the source of supply are included with the hose. (United Metal Hose Co., Inc., 89 Chambers street, New York City.)



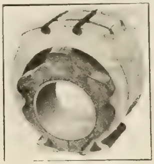
"United" Automatic Barrel Filler.

RADIO HEAD SET FOR AIRPLANES.

In order to secure for radio equipment on airplanes a head set that would exclude the noise of the propeller and the effect of the rushing air, there was devised a form of aviator's helmet with telephone receivers mounted in it so as to fit the ears of the pilot or observer. A portion of it fits the face closely to prevent sounds other than the ones originating in the receiver from being heard by the wearer of the apparatus. A receiver is furnished for each ear, but instead of the hard-rubber ear-pieces, there are caps of sponge rubber. The receivers are held in place by means of the padded leather which composes the helmet, while adjustment is made by lacing the helmet to fit closely the wearer's head. The exclusion of sound is not so complete as to prevent the user from hearing the exhaust from the engine and thereby determining whether or not his motor is working properly.

Radio Head Set; Rubber Ear-Caps.

A RAPSON NON-SLIP UNPUNCTURABLE TIRE.



A Rapson Tire.

Fred. L. Rapson's development of the non-slip unpuncturable tire is composed of a heavy-tread cover and inner air tube, between which is inserted a rubber deflector so designed as to insure the greatest possible degree of resiliency. Containing, as it does, scientifically planned air pockets, the inner tube is protected and assured of cool running. The tires are made in nine sizes, including one for motorcycles, and are fundamentally pneumatic tires, but freed from the annoyances to which the use of ordinary pneumatics subjects the user. There are several different combinations of the component parts, one form of which requires a special rim and wheel, but in another which is suitable for fitting to existing rims, the tube lies close to the rim but not in contact with it and has the resilient rubber core around it on the sides and outer diameter. (Oylers, Limited, 35 New Cavendish street, London, W. 1, England.)

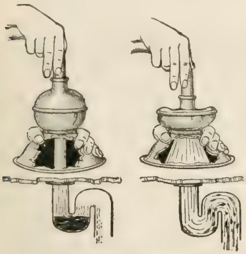
"JIFFY" FOR GOLF BALLS.

"Jiffy" Golf-Ball Renewer.

A compound for painting golf balls and the hangers for doing it efficiently without soiling the hands, will surely make a strong appeal to all who find pleasure in driving "little white pellets over the grass." The "Jiffy" compound, used with its accompanying stabilizer, will coat any ball and dry so quickly, it is claimed, that the ball can be put in the pocket in fifteen minutes and used on the golf course in an hour. (The Pittsburgh Economy League, Pittsburgh, Pennsylvania.)

THE "HYDROMATIC" DRAIN-PIPE FLUSHER.

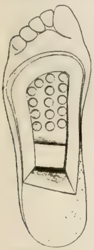
A simple device for clearing obstructed drain pipes and maintaining them free from obstruction thereafter is embodied in the sanitary flusher pictured herewith. It is made of rubber, and all parts are interchangeable and replaceable when worn out. A rubber bell and patented aerostatic bulb combined is attached to a short length of rubber hose; this, in turn, is attached to a rubber connector which fits any faucet. A chain holds the connector firmly to the faucet when the pressure is on. The force of the water pressure cleans out the waste accumulated in the trap of the drain pipe, and the aerostatic bulb multiplies this pressure when the condition requires. Daily use of this flusher for one minute, it is claimed, will keep the pipe from ever becoming clogged. (The Bunker Hill Rubber Works, Bunker Hill, Illinois.)



"Hydromatic" Flusher.

"JIFFY" BABY PANTS.

The newest patent on baby pants made of rubber is represented in the illustration at the right. This is a one-piece all-rubber garment with elastic cemented within the hems at the waist and legs so that all strings and buttons are dispensed with. (I. B. Kleinert Rubber Co., 719 Broadway, New York City.)



Boone Arch Support.

Rubber Baby Pants.

PNEUMATIC METATARSAL ARCH SUPPORT.

A new arch support intended to relieve the pressure from the ball of the foot and raise the metatarsal phalangeal articulation has been recently patented, though it has been in use in the better grade of shoe stores for some time. It consists of a leather inner sole of the proper shape, to which is cemented a piece of rubber shaped to provide the necessary support and in which are a number of small vacuum cups to give the pneumatic effect. These supports are made to fit all sizes of men's and women's shoes and are carefully marked "right" and "left." (Estate of Selden H. Boone, George T. Kimmel, administrator, Chicago.)

"Pastime Balmoral."

THE "PASTIME" OUTING BALMORAL.

The high cut outing Balmoral pictured here is the result of a demand for high-laced footwear for real service in summer. It is made of a superior quality of bleached white duck, with white rubber foxing, the latter being narrow and inconspicuous. The shoe is quite high, with 16 pairs of white enameled eyelets. The sole and heel are of white rubber, of a tough and serviceable quality. The heel is of comfortable walking height. The shoe is one which will commend itself for pedestrian service on summer outings, as well as for street wear. (Gutta Percha & Rubber, Limited, 47 Yonge street, Toronto, Ontario, Canada.)

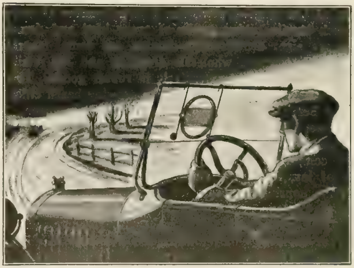
"Marathon" Running Board Mat.

AUTOMOBILE MATS.

To prevent the tracking of mud, dirt and grease into the automobile from the running board and to guard from wear the floor covering below the accelerator pedal, rubber mats are now used with considerable satisfaction. The "Marathon" mat illustrated is intended for the running board and is $11\frac{1}{2}$ by 8 inches in size, but a smaller one, half as wide, is provided for the floor under the accelerator pedal. (The Marathon Tire & Rubber Co., Cuyahoga Falls, Ohio.)

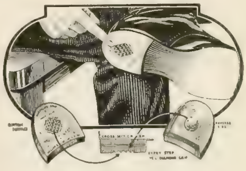
THE "ANTIGLARE" FOR AUTOMOBILES.

A contrivance which permits the automobile driver to derive the full benefit of the lights on his own car while protected from the glare of approachihng lights on other cars is shown



The "Auto Antiglare."

herewith as it appears in use. It is constructed of glass and metal to fit any windshield. The tops of the upright rods have hooked ends to fit over the edge of the windshield and the bottom ends are equipped with rubber suction cups which assist in holding the device in place. The "Auto Antiglare" may be used for either right or left hand driving and the glass can be raised or lowered. (The Portland Sales Company, Inc., 167 Oliver street, Boston, Massachusetts.)



"Diamond Grip" Rubber Heel.

"DIAMOND GRIP" HEEL.

A new rubber heel has a cone-shaped portion sunk in the middle on the reverse side, while on the bottom is a diamond-shaped knurled portion immediately under the cone. This device provides automatic action said to prevent slipping. The heel is called the "Diamond Grip Don't Slip." (Robert E. Miller, Inc., 11 Broadway, New York City.)

Los Angeles Challenges Akron.

By Frederic North Shorey.

WILL the axis of the rubber manufacturing industry one day be shifted from Akron to Los Angeles? That is what Pacific Coast business men predict and the Goodyear Tire & Rubber Co.'s $20,000,000 factory rapidly moving toward completion furnishes a basis for their optimism. They are confident that other rubber companies will be prompt in following and that soon rubber factories will be as common as the citrus groves and vineyards of Los Angeles. They are already mentally arranging locations for up-to-date plants that will turn out rubber footwear, clothing, insulated wires and cables, mechanical rubber goods, hard rubber, in fact all of the varied lines of the gum elastic product.

First among the advantages of Los Angeles is the climate which enables a factory manager to keep his plant going all the year around without the incidental troubles of heating to be considered. Where an eastern plant would, perhaps, be hampered by storms and inclement weather,. a plant in southern California could run all the year around, a most important consideration as the overhead item of heating is reduced to a minimum.

The local market of southern California should not be overlooked as Los Angeles alone has a large number of stores, all of which handle rubber goods of every kind and description. There are eight dental supply houses, ten dental laboratories, 550 dentists, fourteen wholesale druggists and 300 retail druggists, all of which deal extensively in rubber goods. This does not include the populous and rapidly growing beach cities, such as Long Beach, Santa Monica and aristocratic Pasadena. There are at least 100,000 visitors every season to Los Angeles, including wealthy invalids from all over the world. The lighting and power companies adjacent to Los Angeles use thousands of miles of insulated wire which a local company could supply, while the housing problems for employes can be solved much easier than in any of the more populous eastern centers. Aside from local enthusiasm, there are sound reasons back of the Goodyear company's move, which apply equally to other great industrial enterprises, and particularly those making rubber goods. Some of these may well be presented for the consideration of other manufacturing concerns, which perhaps too long have been anchored in the more populous centers of the East.

In the first place, the population of the Pacific Coast is growing more rapidly than any other portion of the United States, and with it the rubber trade. Only two states in the Union exceed California in the number of automobiles and trucks used. These are Ohio with 417,400 automobiles registered in 1918, and Illinois with 389,135, while California is a good third with 351,863, and the first two states mentioned have double the population of California. Even New York has only 253,588 machines and Pennsylvania, 370,110. So the use of automobiles in California, and especially around Los Angeles, creates a large demand for tires.

Regarding the advantages of Los Angeles itself, there is an abundance of good factory sites in almost any direction from its center, probably as good as that selected by the Goodyear company. The question of fuel is easily disposed of, as the city is

VIEW OF A PORTION OF THE WORK BEING DONE ON THE PLANT OF THE GOODYEAR TIRE & RUBBER CO., OF CALIFORNIA AT LOS ANGELES.

in the midst of an oil district, one of the biggest storage stations of the Standard Oil Co. being located but a few miles from the city limits on the coast, to which the oil is piped from the various wells by a pipe line. Efforts are now being made by the Standard and Union Oil companies to increase their product, drilling for new wells going on constantly. There are a number of oil wells in Los Angeles itself, only a short distance from the postoffice.

A large part of the crude rubber used in the United States now comes directly from the Far East through Pacific ports, to be transported to the rubber centers of the East. This extra haul can be avoided if the rubber is sent to factories located in Los Angeles. Moreover, the line from the Far East by way of Los Angeles over the southern roads is better than the route by way of Seattle and the railroads from Seattle to Akron, where in winter-time snow, ice and congestion seriously interfere with transportation. Thus, a continued flow of traffic may be

MEMBERS OF THE GOODYEAR TIRE & RUBBER CO.'S OFFICE FORCE AT LOS ANGELES, NOVEMBER 1, 1919.

obtained at a lower cost than is possible over the northern routes. It is also within the realms of probability that the "machine grown rubber" from California, Arizona and Texas will one day furnish another reason in favor of Los Angeles. The natural center for cotton shipments coming from the Imperial and San Joaquin valleys and the rapidly growing fields of Arizona, is Los Angeles. In addition to this it has preferential rates from all Texas points for export cotton. The Goodyear company takes advantage of this nearness to the cotton fields by the establishment of its cotton factory for the manufacture of fabric to be used in its tire industry. Furthermore, sulphur, talc, asbestos and many other ingredients used in rubber compounding are to be found within our own borders and will be available upon demand.

As for outlets for manufactured goods in addition to the local market there is the overseas market, Japan, China, Oceanica, Australia and India. So also the east and west coast of South America, South Africa and even Europe are more accessible than they are in Akron.

The harbor facilities of Los Angeles are particularly advantageous for industrial enterprises. It is declared that freight can be handled there at 10 per cent less than in any other port on the coast. The United States has spent approximately $6,000,000 on the breakwater, jetties and dredging in the harbor, and wharves, freight sheds, warehouses, railroad terminals, paved streets and other facilities have been constructed for the economical handling of freight.

It is claimed that the largest and perhaps the finest pier in America has been built in the outer harbor. It is more than half a mile long and 650 feet wide. It was constructed by building a rock bulkhead around the area and filling in the center with solid earth dredged out of the harbor in digging channels. These channels were made 35 feet deep on each side of the pier.

A reinforced concrete wharf 2,500 feet long and 40 feet wide was built along the west side of this pier, and a freight shed of steel and asbestos-protected metal was built on and back of this wharf. More than two miles of railroad tracks and a paved street were built to serve this wharf and shed.

Last, but not least, among the city's biggest assets are its open-shop policy and traditions. When the longshoremen's strike tied up the San Francisco water front and sent vessels to Los Angeles to be unloaded dock work went ahead here uninterruptedly, in spite of the strike. Free labor has always been insisted upon, and attempts at strikes, whether by agitator elements, within or without the city, have invariably proved failures, as witness the recent attempt to cut the city off by a railroad strike in sympathy with the carmen's strike in that city, both of which were called off, after it was seen there was no hope of success. A shipbuilding strike at the yard in the harbor, which lasted for several months, was also called off, the agitators who had stirred up the trouble abandoning their efforts in disgust.

Los Angeles County alone has 107,000 automobiles and 15,000 trucks, fully one-third of all those in the State. There are 75 automobile agencies in the city, representing all the standard makes of machines made in the United States, 250 garages and over 200 tire agencies, to say nothing of oil stations, electric service stations and the like. The county highway system has 470 miles of good roads and the city 1,500 miles of paved streets. Southern California itself has 2,368 miles of paved highways and 10,000 miles of highly improved roads extending from Los Angeles to the Mexican border and to the northern extremities of the State. The State itself purposes to improve this system greatly in the coming year through the $40,000,000 bond issue voted at the last election.

There are reports that other rubber companies, following the example of the Goodyear company, are already negotiating for sites, but no definite announcement has yet been made. Three other rubber companies have plants located in southern California, all in the vicinity of Los Angeles; the Hendrie Tire Co. at Torrance, the industrial city in close proximity to the harbor; the Samson Tire & Rubber Co. at Compton, a suburban town on the line of Long Beach, and the Savage Tire Co., with its main plant at San Diego, and a branch in Los Angeles.

PRACTICAL HINTS ON RETREADING.

By A. B. Zwebell.

A recent trip through the East afforded the writer an opportunity to observe the manner in which the business of tire retreading is carried on. It was noticeable that some repair men are careless in their work and reckless in guaranteeing poor workmanship, while others waste time and work on worthless tires, all of which brings retreading into disrepute. Therefore, some practical suggestions which should be helpful to all who engage in the industry of retreading tires may be of interest.

The first step toward a successful business is to pick out first-class tires to retread or to substitute such tires as are worth retreading. First-class work is essential and it may pay in the end to reject two-thirds of the tires brought in for retreading, if they are of poor quality. The tire should be of standard make for these are made of material of good quality and are usually suitable for retreading. A good cord tire, such as are becoming rapidly more popular, invariably wears out the original tread. The added cost of a cord casing makes the owner try to economize by turning to retreading.

Moisture in a carcass is very detrimental to retreading a tire. The carcass should be thoroughly dry; otherwise the casing is sure to bulge when subjected to the heat of the mold. It is always advisable to remove the tread in the usual manner and, after buffing, to dry the tire thoroughly in a vacuum drying oven or in the heated mold itself. Three periods of thirty minutes each are sufficient to dry thoroughly any ordinary casing. Unless dried a tire when built up and placed in a mold will expand and separate the plies of fabrics or cord. When the plies are separated the tire becomes weak. Expansion is caused by gas or steam and makes it difficult to remove the tire from the mold.

Many successful men reline their tires; not with the ordinary inner liner, made of inferior material and lacking shape to set in the tire, but with a first-class shaped liner, preferably one taken from an adjusted or rim cut tire. This liner can be made by any repair man or may be purchased from a supply house handling vulcanizer supplies.

There are complaints of improper fitting and stitching down of liners which do not conform to the curve of the tire, thus causing friction, heat and endless tube pinches and other troubles. Experience proves that a liner, properly inserted, stitched and vulcanized (not cemented), with the addition of the pressure obtained from the new types of vulcanizers and retreaders, fortifies the tire; the liner becomes a part of the tire itself, preventing blowouts and like accidents.

Care must be taken with steaming and the preparation of the carcass. It pays to remove the tread and old breaker of a tire. Often the outside ply of fabric is water-soaked, which causes the fabric to deteriorate and become hard and glazed, making it difficult for the cement to adhere or soak into it. This ply of fabric may be removed profitably when a three-ply liner is inserted because two extra plies are then added.

The reinforcing of tires should be done from the inside, for it is a waste of expensive fabric to apply it on the outside. The necessary repairs to a casing should be made before adding the new tread. The repairs should be at least semi-cured, as the cure of retreading and repairs in one operation has not proved successful. Complaints are heard of low spots on tires; these are usually caused by insufficient sand in the sand bags, by the pock-

eting or trapping of air, by improper tightening of clamps and other causes.

Retreading materials should be especially compounded and ordinary repair stocks should not be used. It is always well to have the proper tools. A heavy tread roller is a good investment and also a time-saver. A porcupine roller saves labor by rolling out the air blisters. A few dollars spent on necessary and labor-saving tools enable a man to turn out a first-class job. Neatness, too, is a requisite. It is just as easy to turn out a neat job as a slovenly one. Why not have a place for every tool and wrench and have the clamps, bars and bags arranged neatly on a shelf or rack?

In a small shop visited in Canada the work was perfect in every detail. The foreman said he seldom had two "touch ups" in a week. The secret of his good work lay in the foundation of his molds. These were polished after every cure with very fine sandpaper or steel wool. A few hours devoted to the surface of the molds, to cleaning them and keeping them clean, will prove profitable. For this purpose, though solutions of various kinds are used, plain Castile soap of the highest quality obtainable is excellent. A light film of this, diluted in water, should be painted on the molds; this will keep the rubber from sticking to the molds, will do away with air pockets and will maintain an even flow of rubber.

SPLICING BALATA BELTING.

Balata and rubber differ radically in their nature and properties, which necessitates very different methods of treatment in their manufacture. Balata belt making, previously described in detail in The India Rubber World, May 1, 1919, does not include vulcanization as in the case of rubber and this makes the process of splicing balata belting a specifically different process. The preparation of the ends requires the use of a square, a knife, and a warming iron for softening the balata, to permit separation of the plies, a special scraper for use on the balata surface, and balata cement, a solution of balata in a volatile solvent.

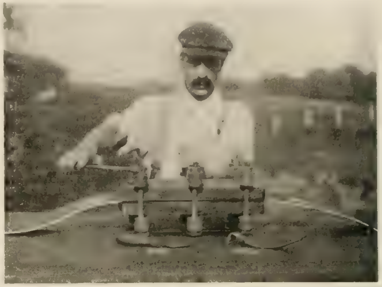
The preparation of the belting for a splice, in either rubber or balata, involves removal of the duck plies of each end to be

(R. & J. Dick, Limited.)

The Plies of Each End of the Belt Being Removed in Spaced Steps, It Is Ready for Splicing.

joined in a series of steps spaced so that each end will replace the removed portions of the opposite sides of the joint.

The prepared surfaces having been warmed by radiation from the red-hot iron heater held a short distance over them, are brush coated with the balata solution. The surfaces are dried perfectly by about 30 minutes' exposure. The laps are heated until they are very tacky, when they are carefully matched and clamped together in a suitable bench belt press, which has been well wetted to prevent the belt from sticking to it. The splice remains under moderate pressure for about ten minutes. After



(R. & J. Dick, Limited.)

The Cemented Ends of the Belt Are Joined and Subjected to Moderate Pressure on a Belt Press.

removal from the press the joint is cooled in water and strengthened by sewing or riveting, or by diamond stitching with rawhide.

PILOT BALLOONS.

One remarkable new development brought on by the war has been the scientific observation of the upper air, the measurement of horizontal and vertical distance, the marking of air currents in which the departments of the Government have shared—the War Department, the Navy and the Meteorological Section of the Department of Agriculture. Very soon they found it possible to work in harmony with each other and also with the air services of Great Britain, France and Italy.

Hundreds of young men were trained in the Signal Corps and other branches to take the necessary observations and many accompanied the forces abroad. The Ordnance Department needed the information because the knowledge of air conditions was essential in the handling of guns; that knowledge was vital to the men who went up in airplanes and dirigibles, whether fighting at the front or carrying mails and despatches; it was needed by the Navy for vessels and airships.

Among the instruments found useful were the little pilot balloons made of rubber. They were used to determine altitude conditions, air currents at different elevations and the velocity of the winds, and, when the armistice was signed, were about to be sent over enemy lands to distribute literature that might disconcert the foe.

The balloons used had to admit of high inflation and to have as little weight as possible. They were made of rubber, so cured as to retain its elasticity for a while and to allow the hydrogen to diffuse only slowly through its walls. Pure rubber balloons of a spherical shape were used, either uncolored for use against a clear sky or dark red for cloudy weather. The smaller size inflated to a diameter of 80 centimeters, weighing 20 or 30 grams, the larger, of 120-centimeter diameter, weighed 50 to 60 grams. It was very difficult to manufacture satisfactory balloons larger than 9 inches in diameter when uninflated.

The balloon ascends at a remarkably constant rate, about 10 feet a second. It is kept in sight up to distances as far as 60

miles away horizontally and nearly 20 miles perpendicularly. The rapid diffusion of hydrogen through the rubber had made flights of over a hundred miles impossible. Through an ingenious improvement, the addition of a bellyband which kept the girth of the balloon constant at a diameter of 4 feet through the discharge, while shrinking, of a few drops of kerosene, the balloon rises to higher levels until its ballast of kerosene or alcohol is exhausted.

In the first week of October, 1918, 60 such balloons, adjusted to fly between 15,000 and 25,000 feet altitude, were let loose from Fort Omaha, Nebraska; 34 of these were picked up and returned to Washington. One came down within 10 miles of New York, 1,100 miles from the starting point; another in Virginia, 930 miles away. The rest were scattered over Ohio, Kentucky, Illinois, Wisconsin and Iowa. Not one went west from Omaha.

By the fall of 1918 there were 26 upper air stations distributed over the United States; daily charts are constructed showing the

Beginning of a Pilot Balloon Run.

wind direction and speed 500 meters above the ground with other charts for 1,000, 1,500, 2,000, 3,000 and 4, meters. It is now possible to map out the upper airways across the Atlantic as the steamers are sending up long-range balloons that drop down in Western Europe.

While great improvements were made and are being made in the instruments for accurate scientific observation it was found necessary also to devise simpler means for quick observation in the field and for rapid calculation. The Signal and the Meteorological services have developed a whole mathematical science from the formulas derived from observing the motion and variations of the pilot balloons.

NEW INCORPORATIONS.

Akron Tire Co., Inc., October 8 (Delaware), authorized capital 100,000 shares without nominal or par value. B. Ruskay, 19 West 69th street; F. E. Wysong, 202 Riverside Drive—both of New York City; D. W. Steele, Jr., Brighton Beach, Brooklyn—both in New York. Delaware agent, United States Corp. Co., 311 South State street, Dover, Delaware. Home office, Honeywell and Milliken avenues, Long Island City, N. Y. To build, rebuild, and construct tires, tubes, and all other kinds of automobile accessories.

Automatic Tire Machine Corp., November 12 (New York), $1,500,000. H. G. E. Smith, Buffalo; S. H. Millener, Tonawanda—both in New York; W. A. Schaffer, Detroit, Michigan. To manufacture machines for weaving and rubberizing fabrics.

Cell Tube Tire Co., The, November 17 (Delaware), $300,000. B. M. Barrett; M. Butler; M. M. Lucey—all of Wilmington, Delaware. Delaware agent, Colonial Charter Co., 927 Market street, Wilmington, Delaware. To deal and trade in rubber.

Consolidated Tire & Rubber Mfg. Co., Inc., October 6 (Massachusetts), $100,000. J. A. Page, 1234 Great Plain avenue, Needham; J. L. Merrill, 9 Lincoln street, Dorchester; W. C. McCallum, 15 Netherlands Road, Brookline—all in Massachusetts. Principal office, Boston, Massachusetts. To manufacture, repair, rebuild, and deal in automobile tires, rubber shoes, soles, heels, rubber and rubberoid.

Dunbar Tire & Rubber Co., September 25 (West Virginia), $1,000,000. R. W. Crissey; C. R. Wesley; E. B. Petty—all of Kent, Ohio; D. O. Blagg; W. T. Moore—both of Charleston, West Virginia. Principal office, Charleston, West Virginia. To manufacture rubber goods.

Eclat Rubber Co., The, August 26 (Ohio), $50,000. W. H. Stillwell, president; J. A. Seabold, vice-president; E. F. Ast, secretary, treasurer and purchasing agent. Principal office, 31 East Wetmore street, Cuyahoga Falls, Ohio. To manufacture mechanical rubber booth and automobile inner tubes.

Eureka Rubber Cement Co., Inc., October 23 (New York), $50,000. L. M., and I. M. Halpern, both of 2868 Heath avenue, Bronx, New York; W. F. Law, Maplewood, New Jersey. To deal in rubber and rubber cement.

Fay & Youngs Rubber Corp., November 18 (New Jersey), $350,000. M. L. Youngs; C. L. Fay, both of Mt. Vernon, New York; F. H. Miller; A. M. Youngs, both of Trenton, New Jersey. Principal office, 36 Prince street, Trenton, New Jersey. Agent in charge, F. H. Miller. To manufacture, buy, sell, import, export, trade and deal in druggists' rubber goods, etc.

General Tire Co., Inc., The, November 21 (New York), $10,000. E. J. Hogerty; T. A. McCole; J. F. Fearn—all of 170 Broadway, New York City. To manufacture rubber products.

Gordon Pen Co., October 21 (New Jersey), $50,000. R. J. Heitzman, 217 Fourth street; W. Gordon, 646 Lewis street, both of Union Hill; J. Abegg, 101 Palisade avenue, West Hoboken—both in New Jersey. Principal office, 450 Palisade avenue, West New York, New Jersey. Agent in charge, R. J. Heitzman. To manufacture, buy, sell, import, and generally deal in stylographic and fountain pens.

Keystone Tire & Rubber Co., Inc., November 21 (New York), $5,000. J. Jacobs, S. Bernheim, W. Loewenthal—all of 1877 Broadway, New York City. To manufacture tires.

Knox Tire & Rubber Co., The, June 27 (Ohio), $2,000,000. B. E. Frantz, president; E. S. Cannell, vice-president; F. D. Spencer, secretary and treasurer. Principal office, Mt. Vernon, Ohio. To manufacture tires and tubes.

Kokomobile Tire & Supply Co., Inc., November 7 (New York), $25,000. C. W. Barrell, G. B. Wilkins; R. V. Henery—all of Buffalo, New York. To manufacture rubber goods.

McEwen Tire Ventilator Co., Inc., November 20 (New York), $100,000. J. H. Rosen, Mt. Vernon; S. S. Rosen, Monterey Hotel, New York City, both in New York; T. E. McEwen, Caldwell, New Jersey. To manufacture automobile tires.

Mandler Tire Co., Inc. October 24 (New York), $5,000. H and M. Mandler, both of 117 West 115th street; S. Silverman, St. Nicholas avenue and 118th street—both in New York City. To manufacture tires.

Needham Tire & Rubber Co. of New York, Inc., October 24 (New York), $100,000. H. A. Rambonnet, Brookline, Massachusetts; G. J. Constable, Plainfield, New Jersey; E. C. Klesper, 967 St. Johns Place, Brooklyn, New York. Office address, 1695 Broadway, New York City. To manufacture tires.

New Method Tire Corp., November 17 (New Jersey), $50,000. B. De Mattia, 10 Maple Place; P. De Mattia, 40 Union avenue, both of Clinton; O. Basten, 37 East Pierrepont avenue, Rutherford; L. F. Orbe, 60 Summer street; J. A. Crowley, 113 Sherman street; J. H. McGuire, 293 Harrison street, the last three of Passaic—all in New Jersey. Principal office, 1 Wellington street, Clifton, Passaic County, New Jersey. Agent in charge. P. De Mattia. To manufacture rubber tires.

Paramount Rubber Consolidated, Inc., November 12 (Delaware), $2,000,000. T. L. Croteau; P. B. Drew; E. H. Knox—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building. Wilmington, Delaware. To manufacture and deal in rubber goods.

Robert-Irwin Mfg. Co., Inc., November 17 (New York), $30,000. Irwin and Aaron Berkowitz; M. Rappaport—all of 179 Wooster street, New York City. Principal office, 179 Wooster street, New York City. To manufacture auto tire pumps.

Smith Rubber & Tire Co., Inc., The, September 27 (New Jersey), $1,000,000. F. W. and J. H., Jr., Smith, both of Rutherford; T. A. Hopkins, Passaic—all in New Jersey. Principal office, Lawyers Building, Passaic, New Jersey. Agent in charge, F. W. Smith. To manufacture, buy, sell and deal in all kinds of rubber goods.

Solid Inner Tube Co., November 15 (Delaware), $50,000. T. L. Croteau; P. B. Drew; H. E. Knox—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture and deal in tires and tubes.

Stanton-Haskell Tire Corp., November 7 (New York), $20,000. N. D. Haskell, Buffalo; H. A. Haskell, Yougstown; H. E. Stanton, Rochester—all in New York. Principal office, Youngstown, New York. To manufacture tires.

Thompson-Goodyear Rubber Corp., October 21 (New Jersey), $60,000. L. B. Thompson, 202 Market street, Newark; R. T. Wright, 103 Midland avenue, Montclair—both in New Jersey; A. S. Wright, 52 William street, New York City. Principal office, 202 Market street, Newark, New Jersey. Agent in charge, J. A. Stryker. To manufacture, buy, sell, and deal in rubber goods of all kinds.

Tire Improvement Corp., November 26 (New York), $33,750. L. C. Kendall, 473 West 147th street; C. T. Hoskins, 26 Post avenue; C. M. Roberts, 390 Wadsworth avenue—all of New York City. To manufacture tires.

United Tire Stores, Inc., October 18 (New York), $5,000. S. Jarvis, 325 West 93rd street; G. A. McLaughlin, 680 West End avenue; M. J. Moon, 2 Rector street—all of New York City. Principal office, Brooklyn, New York. To deal in tires.

University Rubber Co., Inc., October 9 (Delaware), $600,000. W. Mackay; C. E. Barker; J. H. Jones—all of 9 East 40th street, New York City. Delaware agent, Delaware Corporation Co., 10th and Market streets, Wilmington, Delaware. To real in automobiles and rubber goods of all kinds.

Valor Tire & Rubber Co., Inc., November 1 (New York), $4,000. J. Jacobs; S. Bernheim; W. Loewenthal—all of 1877 Broadway, New York City. To manufacture tires.

THE EDITOR'S BOOK TABLE.

"DETERMINATION OF PERMEABILITY OF BALLOON FABRICS." By Junius David Edwards, Associate Chemist, Bureau of Standards, Government Printing Office, Washington, D. C.

THIS is pamphlet No. 113 of the Technologic Papers of the Bureau of Standards. The paper discusses the theory of the permeability of balloon fabrics, methods of determination, standard test, operating directions and calculations. The bulletin is sold by the Superintendent of Public Documents, Washington, D. C.

"THE INDUSTRIAL REPUBLIC." BY PAUL W. LITCHFIELD. The Goodyear Tire & Rubber Co., Akron, Ohio. (Paper, 16 mo, 73 pages.)

With thinking persons everywhere giving serious attention to the complex industrial and economic conditions existing throughout the world, and with governments attempting to effect a working agreement between capital and labor, the appearance of this little book is most opportune. It is written by a man who has spent his life employing labor, and who as vice-president and factory manager of one of the largest American rubber plants has had opportunity to know the industrial situation from every angle.

Mr. Litchfield discusses frankly and freely the labor and economic problems now confronting the United States and suggests possible solutions. He traces the history of labor and industry and concludes that autocratic capitalism must come to an end, just as autocratic political government is being cast off. Harmony and justice to all, he believes, will be assured only through participation of labor in the management and ownership of large industrial plants. The step recently taken by the Goodyear Tire & Rubber Co. in creating a council of industrial relations is a start in the direction that all big companies will ultimately see their way to follow.

Wages, he asserts, should be determined by the results of labor rather than by the time consumed, since capital cannot sell time but only the products of labor.

As capital has taken all the risks of business it has been customary for it to claim all the rewards except what was necessary to pay for labor, materials and other charges. As a result of this system two classes have grown up, one interested only in profits and the other only in wages. This condition can be overcome only by bringing about a community of interest.

He declares that if labor has received the current wage and capital the current rate of interest, then the profits which have been produced are the result of both labor and capital and should be divided between the two.

In working this out Mr. Litchfield would give labor representation in the management of the business, but until labor is in a position to bear its share of the financial risks, capital must be in control of the management. He advocates that employes be given the fullest opportunity to invest in the securities of the company for which they work and as stockholders to share in the distribution of profits as they are earned.

Mr. Litchfield takes a daring stand regarding the respective rights and duties of men and management, and the part to be played by labor in the future development of American history. He clears up numerous points not generally understood and presents many new and advanced ideas bearing on this vital issue of the hour. Many big employers of labor may not altogether agree with him, but his conclusions are bound to receive widespread attention because of his long experience and high position in the industrial world.

EXTRAIT DU BULLETIN DE LA SOCIETE INDUSTRIELLE DE Rouen, No. 4, July-August, 1918. André du Bosc. Pubblished by J. Girieud, 58 Rue des Carmes, Rouen, France. (Paper, 12 pages.)

This reprint from the "Rouen Industrial Society Bulletin" consists of notes and papers by André Dubose on the "Destructive Distillation of Vulcanized Rubber"; "Devulcanization of Rubber by Accelerators," and "Devulcanization of Rubber by the Formation of Hexamethylene Tetramine in Rubber."

"DIRECT DETERMINATION OF INDIA RUBBER BY THE NITROsite Method." Technologic Papers of the Bureau of Standards, No. 145. By John B. Tuttle and Louis Yurow. Issued October 22, 1919, by the Government Printing Office, Washington, D. C.

This is the official publication of a paper read at Boston, September 12, 1919, at the meeting of the Rubber Section of the American Chemical Society, and abstracted in THE INDIA RUBBER WORLD, October 1, 1919, page 17.

NEW TRADE PUBLICATIONS.

BLACK & DECKER MANUFACTURING CO., BALTIMORE, MARYLAND, is sending out a beautiful illustrated price list and catalog of its electric air-compressors and Lectroflators for inflating tires, and portable electric drills and valve grinders for use in tire factories, garages and repair establishments. The cuts of these various machines and tools show the details of construction most efficiently. The book is handsomely printed in two colors and tastefully bound, and the accompanying descriptions are full and lucid.

"UNDER COVER" IS THE TITLE OF AN ATTRACTIVE LITTLE 24-PAGE magazine published by the H. H. Robertson Co., Pittsburgh, Pennsylvania, manufacturer of hydro-carbons and mineral rubber. While the publication is intended primarily for distribution among the employes of the company at its three manufacturing plants and its sixteen offices and agencies, it contains some bright snappy reading of general interest, and information regarding the company and its products. It is copiously illustrated with exceptionally good pictures.

A VERY HANDSOME AND DIGNIFIED PORTFOLIO OF PLACARDS APPEALing to the public to trust to the recommendations of dealers in tires is issued by The Marathon Tire & Rubber Co., Cuyahoga Falls, Ohio, with the general title "Building Good Will for You." While the sheets bear the name of the Marathon company they form part of a general advertising campaign designed to benefit all tire dealers.

This company also began recently to publish "Angles," an eight-page pamphlet, as its official organ. This issues monthly for the benefit of tire dealers.

THE BELDEN MANUFACTURING CO., CHICAGO, ILLINOIS, HAS published a neat 20-page pamphlet describing its business, the manufacture to order of articles molded from plastic materials such as Condensite, Bakelite, etc., giving much information to customers and prospective patrons. A large number of products are pictured and described.

"WEATHER AND HOW IT IS MANUFACTURED" IS THE TITLE OF a handsome 60-page brochure published by the Carrier Engineering Corp., New York City, explaining by halftone and text the necessities for dry or humid air in many manufacturing industries, and its various humidity and temperature-regulating devices, by which it claims ability to suit the exacting requirements for best results in factories. The book abounds in excellent illustrations of establishments where the concern's apparatus is installed. Among these are shown the drying room and the dehumidifying apparatus at the New York Belting & Packing Co., at Passaic, New Jersey. The book is substantially bound in board covers, with an attractive etching above the title.

AT LEAST ONE PRODUCER IN MALAYA CAN STAND FURTHER declines in the price of rubber, for the manager of the Kuala Selangor company reported that the output of 625,000 pounds had cost 7½ pence a pound to produce.

JUDICIAL DECISIONS.

Double Fabric Tire Co. *vs.* General Tire & Rubber Co.—In equity, District Court, Northern District of Ohio, Eastern Division, August 12, 1919.

Patent No. 964,446, for a blow-out patch for use in reinforcing or repairing automobile tire casings, was declared invalid on the grounds of want of invention and of prior public use. Four persons in repair shops in Ohio, Pennsylvania and New York testified that they had used similar patches and the identical process before the patent was granted. Bill was dismissed. (See The India Rubber World, September 1, 1919. (Federal Reporter, Volume 258, page 932.)

Featheredge Rubber Co. *vs.* Miller Rubber Co. et al.—Circuit Court of Appeals, Sixth Circuit, June 30, 1919.

Patent No. 1,045,234, issued to Willis and Felix for a process for making artificial sponges, which had passed duly to the Featheredge company, was declared invalid because the disclosure of the process in the patent is not sufficient to enable one skilled in the art to manufacture sponges with commercial success.

It was shown that the president of The B. F. Goodrich Co. had brought back from Russia the identical process, and after making many sponges had stopped the manufacture because it was unsatisfactory. No rubber sponges were made successfully without paragol, a later invention which the plaintiff used but did not declare in the patent, and which the defendant also used. Judgment of lower court affirmed. (See The India Rubber World, November 1, 1918.) (Federal Reporter, Volume 259, page 563.)

TREASURY DECISIONS.

No. 43444.—Protest 930346 of F. W. Myers & Co. (Detroit).

Rubber Buffing Scrap.—Waste scrap rubber buffing, classified as waste not specially provided for at 10 per cent ad valorem under paragraph 384, tariff act of 1913, is claimed free of duty under paragraph 513 as scrap rubber fit only for manufacture.

Opinion by G. A. Adamson: While the statute does not specifically mention the word "buffing," the merchandise was held to come squarely within the provisions of paragraph 513. United States v. Michelin Tire Co. (1 Court Customs Appeals, 518, T. D. 31544) noted. (Treasury Decisions, Volume 37, No. 19, page 37.)

No. 43456.—Protest 931900 of American Chicle Co. (Buffalo).

Chicle.—Dissected chicle classified at 20 cents per pound is claimed dutiable at 15 cents per pound under paragraph 36, tariff act of 1913.

Opinion by G. A. McClelland: The assessment of duty appearing to be in harmony with G. A. 7984 (T. D. 36788) and abstract 41818, affirmed in Sheldon v. United States (8 Court of Customs, Appeals, 9; T. D. 37123) and American Chicle Co. v. United States (9 Court Customs Appeals; T. D. 37841, the protest was overruled. (Treasury Decisions, Volume 37, No. 20, page 15.)

DECISIONS OF THE FEDERAL TRADE COMMISSION.

Federal Trade Commission *vs.* William T. Batcheler.

George Batcheller and Akron Tire Co., Inc. (Long Island City, New York).

The respondents were cited to appear in March last with E. P. Jones and others before the Federal Trade Commission on the charge of repairing automobile tires and selling them as new with false representations as to their being able to run 4,500 miles. The commission on September 25, 1919, found that the respondents used unfair methods of competition, in the identical words of its decision against the other respondents, delivered last April, reported in The India Rubber World for May 1, 1919, and enjoined them from making false statements, from offering for sale reconstructed tires without distinct indication that they are rebuilt and from advertising that the tires can give service for 4,000 miles. (Federal Trade Commission, Docket 253, September 25, 1918.)

THE OBITUARY RECORD.

HEAD OF THIRTY-TWO RUBBER STORES.

Wilbur S. Alling, head of the Alling Rubber Co., which has retail stores in many cities of Connecticut, Massachusetts, and neighboring states, died suddenly November 15, 1919, at a hotel in Willimantic, Connecticut, to which place he had gone with his son in order to purchase a business block that should contain the thirty-third retail rubber store of their company.

Wilbur S. Alling.

Mr. Alling was born in Oxford, Connecticut, March 18, 1859, of Puritan stock, the son of Edwin J. and Laura (Bigelow) Alling. He descended in the direct line from Roger Alling of Kempster, England, who settled in New Haven in 1638, was treasurer of the colony for thirty years and deacon of the Centre Church. His residence was on the land now between Church and Chapel streets, and on it stands to-day one of the Alling stores. Mr. Alling's father was a merchant and farmer and is still alive; he volunteered at the first call in New Haven, fought through the four years of the Civil war and was severely wounded at Atlanta.

Mr. Alling was educated in the country school at Oxford, and when seventeen clerked in a country store at New Hartford. By 1887 he had established a rubber store in partnership with his brother, Noyes E. Alling, a business which has developed into a chain of 32 retail stores in six states. At the same time he started the Morgan Silver Plate Co., of Winsted, of which he was president until his death. He was married in 1881 to Mary Edna Tiffany, by whom he had five children, three of whom survive: Mrs. Edna Alling Smith, Ward Tiffany Alling, and Sidney Bigelow Alling. The family moved to Norwich in 1890, and Mrs. Alling died in 1901. Mr. Alling married again, in 1906, Minnie Smith, who survives him. He also leaves four brothers, all of whom were associated with him in business.

Mr. Alling was one of the largest holders of real estate in Norwich; he was a member of the Chamber of Commerce in that city and of the Dime Savings Bank corporation, and was an active worker in the Congregational Church and in the Y. M. C. A. He was a representative in the Connecticut State Legislature for two terms.

FORMER RUBBER FACTORY ENGINEER.

Charles H. Cary, who was formerly chief engineer at the factory of the National India Rubber Co., Bristol, Connecticut, but was retired a quarter of a century ago, died October 19, 1919, at the Rhode Island Hospital, Providence, where he had been undergoing treatment for a week. He was 73 years old and was born in East Hampton, Maine.

The delayed publication of this issue makes possible the notice of the death of George E. B. Putnam that occurred early in December. He was well known in the shoe, leather and rubber industries as a writer and journalist. A complete obituary will be published in the January number.

Index to "Rubber Machinery" will be sent free upon request.

Activities of The Rubber Association of America.

DIVISION MEETINGS.

RUBBER RECLAIMERS' DIVISION.—The Rubber Reclaimers' Division held its first meeting in several months on November 6 at the Yale Club and a number of matters of general interest were given attention, the most important being the revision of the standards of scrap rubber specifications and packing, which are to be reissued as soon as they can be printed.

MECHANICAL RUBBER GOODS MANUFACTURERS' DIVISION.—On November 18 the Executive Committee of the Mechanical Rubber Goods Manufacturers' Division held its regular monthly meeting, which was well attended, and a number of subjects of considerable interest to the division were given attention. As no definite conclusions were reached with respect to the more important of the subjects, no announcement of the results can be made at this time.

SOLID AND PNEUMATIC TIRE MANUFACTURERS' DIVISION.—The Joint Executive Tire Committee, which meets regularly every month, held its November meeting on the 19th and disposed of a large docket which included subjects of considerable importance to the industry, the conclusions of which are to be submitted to all members of the tire divisions for ratification before being made effective. The indications are that if the work of the Executive Committee continues to increase it will soon be necessary for the committee to give more than one day a month to division matters.

THE TRAFFIC DEPARTMENT.—The Traffic Committee held its regular monthly meeting on November 20 and the usual interesting meeting was had and a large docket was handled. Among the subjects of principal interest were the proposal to secure more favorable rates in the West to cover mixed carload shipments of rubber goods, and the policy to be pursued by the carriers after their relinquishment by the Government in connection with the handling of claims.

DIVISION ANNUAL MEETINGS.—It has been the practice for all divisions to hold their annual division meetings coincident with the annual meeting of The Rubber Association of America, Inc., which is scheduled for January 5 at the Waldorf-Astoria, New York City. Division meetings have usually been held on the morning of the day of the annual meeting or the afternoon of the day before, but as January 5 is a Monday, some deviation from the usual practice is necessary and division meetings may have to be held later in the week. A program embodying the schedule for all meetings of divisions or special committees is to be issued as soon as possible.

NEW MEMBERS.

At recent meetings of the Executive Committee of the association the following named new members have been elected, the first three to firm membership and the last to associate membership:

Washington Tire & Rubber Co., Spokane, Washington.

A. C. Spencer-Hess, New York City.

W. J. McDavid & Co., Inc., New York City.

Arthur B. Newhall, Hood Rubber Co., Watertown, Massachusetts.

FORMATION OF INDUSTRIAL RELATIONS COMMITTEE.

The Board of Directors of the Rubber Association has authorized the formation of an industrial relations committee for the association which is to serve as a medium for the discussion and exchange of ideas respecting industrial relations. The term "industrial relations" is used in the broad sense as having reference to all of the conditions attached to the relation of employer and employe, including employment, sanitation, recreation, shop rules, etc.

> During the period after the beginning of the European war very unusual and radical changes were effected in the relation of employer and employes, due to the unusual demand for production which emphasized the world's necessity for many articles, thus creating a great demand for labor. The abnormal manufacturing conditions referred to in the foregoing gave labor a most unusual opportunity to ask that consideration be given to working conditions, wages, and at least a suggestive voice in determining working conditions. This situation has developed so far that undoubtedly both employer and employes have an entirely different viewpoint and the fundamentals on which employment relations shall be reconstructed must be sound and very different from anything before attempted.

It is not contemplated that the Industrial Relations Committee will undertake work of a paternalistic nature, but rather educational and cooperative activities, and it has been suggested that a general committee be formed from the representatives of firm members who are engaged in the handling of industrial problems for their companies, to consist of not more than twenty-five members who are to be chosen with due regard to the geographical relationship of the various centers of the rubber industry. From this general committee, an executive committee of ten members is to be selected to carry the burden of performing the greater part of the work connected with the activities of an industrial relations organization. The organization of these committees is being effected and it is expected that they will soon begin to function.

ANNUAL MEETING.

A call has been issued for the annual meeting of The Rubber Association at 2:30 p. m., Monday, January 5, at the Waldorf-Astoria, New York City.

THE BANQUET.

The twentieth annual dinner will be held in the grand ball room of the Waldorf-Astoria, New York City, at 7 p. m., January 5, 1920. Tickets will be eight dollars.

Arrangements have been made for seating guests at round tables accommodating parties of ten persons. Members desiring entire tables, or those who wish to sit together but do not require an entire table, will kindly state their wishes when ordering tickets. Tickets are sold only to members or to those in their employ. There is no limitation to the number which each member may purchase.

The Banquet Committee has been particularly fortunate in having secured, as speakers, Charles M. Schwab, of the Bethlehem Steel Corporation, and Lieutenant-General Robert L. Bullard, Commander of the Eastern Department, United States Army, and an interesting evening is thereby assured. The name of a third speaker will be announced later.

NOMINATIONS FOR DIRECTORS.

The Nominating Committee, consisting of Messrs. Bertram G. Work, George B. Hodgman, Harvey S. Firestone, Frederic C. Hood and Henry C. Pearson, have suggested for nomination for directors at the annual meeting of the Association for a period of three years from January, 1920, the names of the following gentlemen:

W. O. Rutherford, vice-president, The B. F. Goodrich Co.

Homer E. Sawyer, vice-president, United States Rubber Co.

A. H. Brown, Meyer & Brown, Inc.

J. S. Broughton, president, United & Globe Rubber Co.

J. A. Maguire, vice-president, The Portage Rubber Co.

SUGGESTED AMENDMENTS TO CONSTITUTION AND BY-LAWS OF THE RUBBER ASSOCIATION.

The Rubber Association has disseminated to all firm members certain suggested amendments to the Constitution and By-Laws, which may be briefly stated as follows:

> FIRST: The providing of more definite and specific conditions under which firms, corporations or individuals, not directly engaged in the rubber industry may participate in the activities of The Rubber Association of America, Inc. The suggested amendments include certain limitation of voting power and different annual membership dues. They also provide that those firms, corporations or individuals not directly engaged in the rubber industry, which are now members of the Association, shall automatically upon the adoption of the suggested amendments became affiliated members.
>
> SECOND: Specific provision to the effect that membership in The Rubber Association is not tranferable from one firm, corporation or individual to another under any conditions.
>
> THIRD: Provision to make membership in the Association effective as for the calendar year instead of, as for a year from the first of the month following date of election.

WORK OF NATIONAL INDUSTRIAL CONFERENCE BOARD.

The Board of Directors of The Rubber Association has directed the attention of members to the work of the National Industrial Conference Board, particularly in connection with the vital industrial problems of the day, including the participation by the Board in the Industrial Conference, held recently in Washington.

The Association is distributing to its membership three of the recent important and interesting publications of the Board, entitled "Works Councils in the United States," "Statement of Principles Which Should Govern the Employment Relation in Industry," and the "Vital Issues in the Industrial Conference at Washington."

The first, "Works Councils in the United States," is a report embodying the results of a comprehensive study of works councils in 225 American industrial establishments, with considerable detail as to the various types of works councils and important facts as to their organization, constitution and methods of procedure.

The "Statement of Principles" is that which was submitted by the Employer Group to the Industrial Conference at Washington, D. C., October 10, 1919.

The "Vital Issues in the Industrial Conference" is an accurate and concise report respecting the principal subject of discussion in the Industrial Conference and is based on the official record of the proceedings of the Conference.

The Rubber Association, as a member of the Board, is contributing a substantial sum in quarterly payments, and it is understood that individual members of this Association are also making substantial contributions to the Board. Further, it is believed that a more intimate knowledge of the work, which may be gained by a careful study of the publications referred to, will bring a full realization of the necessity of continuing this important work and will, perhaps, result in the conclusion by individual companies that it is almost a duty to insure its permanence by assuming at least a small portion of the financial work.

STANDARDIZING CHECKS, VOUCHERS AND INVOICES.

The Standardization Committee of the National Association of Purchasing Agents in concluding its year's research on the standardization of invoices and related documents decided to submit tentative standards for invoices in order to draw constructive criticisms from those who may have occasion to use invoices. As soon as these criticisms are received it will be more readily possible to arrive at definite conclusions as to purchase orders and other documents which relate to invoices.

STANDARDIZED CHECKS AND VOUCHERS.

The Committee considered and approved the idea of standardizing checks and vouchers, which has already gained considerable impetus, having previously had the approval of the Federal Reserve Board, the standard check being 3½ by 8½ inches, the standard voucher being just double that size, or 7 by 8½ inches.

TENTATIVE INVOICE STANDARD.

In view of the fact that thousands of business houses file copies of invoices with the copies of vouchers, it was decided to make 8½ by 7 inches the first tentative standard size for invoices, permitting the printing to be run either way of the sheet. In order to accommodate longer invoices two other sizes were provided for, also those who wish to file these invoices with copies of the vouchers may do so by folding the sheet backwards; that is, with the printing out. This permits the filing of invoices in standard filing cabinets already on the market.

A few years ago when the Standardization Committee adopted a tentative catalog size a great deal of constructive criticism resulted, and a year later a National Conference was held, at which the final size was settled upon; namely: 7½ by 10⅝ inches or its half size, 5¼ by 7½, saddle stitched, so that it may be opened up flat for filing. It is hoped that similar constructive criticism may result now and that during the year it may be possible either to adopt these three sizes permanently or to select some other size as their substitute.

The committee desires to receive criticisms particularly from those who find these three sizes are not suitable for their requirements.

TENTATIVE STANDARD FORM ADOPTED.

The Committee also adopted in a tentative way a form for the invoice which will permit the vendor to record information which he should supply and provide certain standard spaces for the approval of various officials in the offices of the purchaser, and leaves three blank spaces, one on top for the name and address of vendor, on which may be written the name of the purchaser.

The body of the invoice is left blank for description of merchandise, prices, etc. The blank space on the bottom is left for rubber stamps of the purchasing departments to cover such notations as are not embraced in the printed form.

To guard against the possible duplication of payment of invoices, it was decided that the orignal and the original only was to be on white paper, all copies of invoices to be on colored paper. It was also decided to recommend tentatively the use of either 16 or 13-pound paper.

LOCATING THE INDEX IN CATALOGS.

The question of locating the index in catalogs was also taken up. The following quotation from the report of the Standardization Committee explains the attitude of the organization:

> Much confusion now exists in connection with the placing of the index in bound catalogs. Some place it in the front of the book, others in the back, while still others place it in the center. There are arguments in favor of each place, but in view of the custom which has been so long common, whereby a much larger percentage of catalog manufacturers place the index in the back of the book, the committee feels that this should be made a standard practice.

FILING OF CATALOGS.

The following extract from the report of the Standardization Committee may interest those who are responsible for the filing of catalogs:

> Committee recommends that catalogs be filed numerically according to size, catalogs to be indexed on individual cards for each vendor, vendors' cards to be filed alphabetically. Where vendors issue several catalogs on different lines of goods, index card to furnish clue to the goods contained in each catalog.
>
> Committee also recommends that catalogs of book type be filed on shelves. Pamphlets or booklets may be filed either on shelves or in vertical file drawers.

If filed on shelves, gummed stickers should be applied to the back edges, projecting about ¼-inch and numbered on the projections, the tabs to be staggered so that the numbers on each may be readily seen. If filed in drawers, drawers of legal, letter, bill, or document size may be used.

The Standardization Committee for the past year was composed of W. L. Chandler, Dodge Sales & Engineering Co., Mishawaka, Indiana, chairman; W. V. C. Bulkeley, Liberty Steel Products Co., New York City, New York; H. H. Meehan, A. B. Dick Co., Chicago, Illinois; A. Lockwood, Lumen Bearing Co., Buffalo, New York; F. L. Kulow, Willard Storage Battery Co., Cleveland, Ohio.

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

(759.) A reader desires the address of the manufacturer of Underwood retreading molds.

(760.) An inquiry has been received as to what concerns manufacture a tarred paper bag 10 by 15 inches, for holding inner tubes.

(761.) A manufacturer requests the addresses of makers of squawker ends and valves for toy balloons.

(762.) An inquiry has been received for the addresses of manufacturers of pool and billiard cushions of rubber.

(763.) A manufacturer requests the address of the manufacturer of Dodd's cross expansion sometimes known as "Skookum" packing.

(764.) A subscriber desires the addresses of manufacturers of rubberized fabrics in large quantities for tires, sheeting, belting, boots and shoes, mechanical goods, rubber pillows, etc.

(765.) Inquiry is made for the address of the manufacturer of pneumatic telephone receiver cushions.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Request for each address should be on a separate sheet, and state number.

DISTRICT OFFICES.	COOPERATIVE OFFICES.
New York: 734 Customhouse.	Cleveland: Chamber of Commerce.
Boston: 1801 Customhouse.	Cincinnati: Chamber of Commerce. General Freight Agent, Southern Railway, 96 Ingalls Building.
Chicago: 504 Federal Building.	Los Angeles: Chamber of Commerce.
St. Louis: 402 Third National Bank Building.	Philadelphia: Chamber of Commerce.
New Orleans: 1020 Hibernia Bank Building.	Portland, Oregon: Chamber of Commerce.
San Francisco: 307 Customhouse.	Dayton, Ohio: Dayton Chamber of Commerce.
Seattle: 848 Henry Building.	

(31,143.) A commercial agent in France desires agency for the sale of bicycles, automobiles, tires, etc. Correspondence in French.

(31,165.) A man in Belgium wishes to purchase and to have consigned to him rubber goods and articles in celluloid. Correspondence may be in English. Reference.

(31,169.) A merchant in Belgium desires the agency for the sale of manufactured rubber articles. Correspondence and catalogs in French.

(31,186.) A man in France desires an agency for the sale of shoes, hosiery and rubberized fabrics. Correspondence in French.

(31,191.) Commercial agent in Belgium wishes agency for articles connected with heating installation, including joints in asbestos and rubber. Quotations should be c. i. f. Brussels or Antwerp. Correspondence may be in Spanish.

(31,194.) Agencies desired by a firm in France for the sale of textiles and rubber goods. Correspondence in French.

(31,200.) A Rumanian firm, established in England, wishes to buy outright, for sale in England, rubber boots and shoes; for sale in Rumania, boots and shoes of all kinds on consignment against guaranties. Quotations should be c. i. f. English port and Braila, Rumania. Payment in 30 days, English currency, through bank. Correspondence may be in English.

(31,207.) A company in Greece wishes to secure agency for insulated electric cables and wire. Correspondence in French.

(31,231.) Representative of a firm in France desires to secure agency for the sale of rubber goods.

(31,246.) Director of an agency firm in Spain wishes agencies for the sale of crude rubber, rubber goods and tires. Correspondence in Spanish or French.

(31,267.) Importer in England desires agencies for the sale of American manufacturers' goods. Has handled tires. Quotations c. i. f. European ports.

(31,269.) A firm in Spain seeks agencies for the sale of rubber goods, sanitary and medical material, rubber and glass goods for orthopedists, combs, fountain pens. Correspondence in Spanish.

(31,298.) A man in Brazil wants an agency for the sale of rubber tires and all kinds of mechanical rubber goods.

(31,316.) A firm in Canada wishes the sole agency for rubber boots, coats, trousers, hats and all supplies for fishing fleet. Cash on first order.

(31,345.) A manufacturer in Spain wishes to secure an agency for the sale of insulated and enameled copper wire on bobbins and resistance wires. Correspondence in Spanish.

(31,354.) Representative in United States of an importer in Italy wishes exclusive agency for the sale of rubber goods.

(31,399.) A company in Spain wishes to secure an agency for the sale of crude rubber, chemicals, insulators. Correspondence in Spanish or French.

THE HOUSE OF BIRKENSTEIN TO SELL CRUDE RUBBER.

S. Birkenstein & Sons, Inc., of Chicago, New York, Philadelphia and Minneapolis, one of the oldest and most important rubber firms dealing in scrap rubber in the United States, now over a half century in existence, is entering upon the business of handling plantation rubber as well. The head of the company, Louis Birkenstein, who for five years was president of the Waste Material Dealers' Association, has been serving for over a year at the head of the Salvage Department of the Quartermaster-General's office.

A NEW SOURCE OF ASBESTOS.

A great deposit of asbestos in the district of Gaspé, near Port Daniel at the mouth of Chaleurs Bay, which lies between New Brunswick and Quebec, is about to be developed by a Montreal company. The deposit is of low-grade asbestos, the best being of No. 2 crude quality, but there are 2,000,000 tons in sight, the outcroppings of a mountainside, easy to work. Within a short distance are the necessary water-power and raw materials needed to work the asbestos into cement, brick, and other products. A mill with a daily output of 63 tons is being installed.

RUBRAX.

Rubrax is a high melting point asphaltum product intended for mixing with all grades of crude and reclaimed rubbers as a filler, preservative and substitute.

News of the American Rubber Industry.

FINANCIAL NOTES.

The Mason Tire & Rubber Co., Kent, Ohio, has increased its capital stock to $7,500,000, having begun with an initial allotment of only $250,000 four years ago.

The net profits of The B. F. Goodrich Co., Akron, Ohio, for the six months ended June 30, 1919, before deducting Federal taxes, were $7,700,000; at the rate they have been going since, it is probable that they will exceed $8,700,000 for the last six months, making a total for the year of $16,400,000, the greatest in the history of the company. After deducting preferred dividends, the balance available for the $60,000,000 common stock would be $24 a share. The company has increased its capital from $27,000,000 at the end of December, 1915, to $43,500,000 at the end of 1918, and may increase the common dividend rate. In four years the Goodrich company has actually added to its common stock a value of $70 a share.

It seems likely that the sales of The Goodyear Tire & Rubber Co., Akron, Ohio, for 1920 will exceed $200,000,000. The sales for the fiscal year ended October 31, 1919, made a total of $167,315,000, those for October alone being the highest in the company's history, $20,000,000. The year's sales in 1915-16 were less than $64,000,000; in 1910-11 they were only a little over $13,000,000, and in 1907-08 they were just over $2,000,000. The company's business has increased a hundred-fold in twelve years. The stockholders of the Goodyear company have approved the increase of $100,000,000 in capitalization, bringing the total authorized capital to $200,000,000.

The directors of Lee Rubber & Tire Corp., Conshohocken, Pennsylvania, have decided to increase the capital from 100,000 shares to 150,000 shares. Of the 50,000 new shares, 40,000 are offered first to stockholders at $33 a share; the other 10,000 will be offered to employes on a profit-sharing plan. The sale of the additional shares will give the company $1,200,000 with which to expand its business and it is expected that the output by next spring will be 4,000 tires a day.

The statement of the corporation for the eight months ended August 31, 1919, shows net profits of $396,375, before deducting Federal taxes. Net sales amounted to $3,345,067; the cost of goods sold to $2,956,541, and the operating profit was $1,388,526.

The Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, has filed with the Massachusetts Secretary of State a statement of its financial condition, dated August 31, 1919, which we compare with that for 1918.

	1919.	1918.
Assets.		
Real estate	$1,502,090	$1,558,981
Machinery and equipment	943,493	981,414
Merchandise, material, stock in proc	2,675,255	3,038,106
Cash and debts receivabble	1,809,190	2,022,891
Patent rights, trade-marks, etc	1	1
Investments	410,376	......
Total	7,340,409	7,607,394
Liabilities.		
Capital stock	3,850,000	3,789,700
Accounts payable	1,460,025	333,498
Floating debt	......	1,552,000
Surplus	2,030,383	1,932,196
Total	7,340,409	7,607,394

The Hodgman Rubber Co., Tuckahoe, New York, has increased its capital stock by the authorization of $1,000,000 eight per cent preferred stock, $100 par value, and 50,000 shares of common stock of no par value. Of the new preferred stock $197,500 is to provide for the retirement of an equal amount of the old preferred, and the balance has been sold. Of the common stock there are 12,100 shares now outstanding.

EXPLAINING STOCK OF NO PAR VALUE.

It is a common practice of corporations to show at the head of the liability side of their balance sheets the full par value of their capital stock issues outstanding. The stockholder has no means of telling how much of this amount represents paid-in value. For this reason it is becoming a common practice at the present time to issue stocks of no par value. While for balance sheet purposes a value must be placed on the shares, the public is not misled by this to the same extent as it would be by the old practice of putting in the par value.

A few investors seem to be mystified by the new practice, however, and for the benefit of these it may be stated that the value of a share of stock with no par value, may be readily estimated by dividing the profit and loss surplus by the number of shares outstanding, adding to the surplus, of course, any value which may be set against capital stock. ("The Magazine of Wall Street.")

DIVIDENDS.

The Ajax Rubber Co., Inc., New York City, has declared its quarterly dividend of one and one-half per cent, payable December 15 on stock of record November 29, 1919.

The Archer Tire & Rubber Co., Minneapolis, Minnesota, at a meeting of its directors held October 25, 1919, resolved to put its stock on a six per cent cash dividend basis beginning January 15, 1920.

The Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, has declared its regular semi-annual dividend of three per cent on its preferred stock and its regular quarterly dividend of $3 per share on its common stock, both payable December 15, 1919.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, has declared its regular quarterly dividend of one and three-quarters per cent, payable December 15 on its second preferred stock of record December 1, 1919.

The General Electric Co., Schenectady, New York, has declared a cash dividend of $2 per share, and a stock dividend of two per cent, both payable January 15, 1920, on stock of record December 6, 1919.

The B. F. Goodrich Co., Akron, Ohio, has declared its regular quarterly dividend of $1.75 per share, payable January 1, 1920, on preferred stock of record December 21, 1919.

The Kelly-Springfield Tire Co., New York City, has declared its quarterly dividend of $1.50 per share, payable January 2, 1920, on six per cent preferred stock of record December 15, 1919.

The New Jersey Zinc Co., New York City, has declared an extra dividend of two per cent, payable December 10 on stock of record November 29, 1919.

The board of directors of the Overland Tire Co., Newark, New Jersey, recently voted to pay dividends quarterly hereafter instead of monthly. Action on the next dividend will be taken late in December.

The Pennsylvania Rubber Co., Jeannette, Pennsylvania, has declared its regular quarterly dividends of one and three-quarters per cent on preferred stock and one and one-half per cent on common stock, payable December 30 on stock of record December 15, 1919.

The Plymouth Rubber Co., Canton, Massachusetts, has declared its regular quarterly dividend of one and three-quarters per cent, payable December 1 on preferred stock.

The Robertson process metal is a preparation that does not rust and that resists the action of gases and weather conditions. It is a steel sheet protected first by a coating of asphalt on which asbestos is laid and over that a heavy waterproofing covering. It is turned out in various shapes and is used for roofing and siding.

NEW JERSEY ZINC CO.'S RUBBER CHEMIST.

Harlan A. Depew, who has recently associated himself with the research division of the New Jersey Zinc Co., at Palmerton, Pennsylvania, is peculiarly well fitted to fill the position. Having graduated from the Chemical Engineering Department of the University of Michigan in 1913, and after teaching general chemistry for a year, and taking a year of post-graduate work, he received the degree of M. S. in physical chemistry in 1914. The next year he entered the Bureau of Mines at Pittsburgh, Pennsylvania, for research work in physical chemistry and two years later was sent to Seattle, Washington, as the chemist in the new metallurgical station then being opened there.

Harlan A. Depew.

In January, 1918, he was transferred to the war gas investigation under the Bureau of Mines, at American University, Washington, D. C., becoming a second lieutenant, C. W. S., U. S. A., when the War Department took over the work, which office he filled until December 30, 1918. He then entered the employ of the Firestone Tire & Rubber Co., Akron, Ohio, as research physical chemist, working largely on problems of heat, such as heat distribution during vulcanization, and heat due to internal friction.

Entering upon his new duties with the New Jersey Zinc Co. in October, he is now engaged in experimental work on rubber compounds and studying the properties produced by the different pigments in these compounds.

PERSONAL MENTION.

J. P. Davis, purchasing agent of the Belden Manufacturing Co., Chicago, Illinois, has been elected president of the Purchasing Agents' Association, Chicago. Special importance attaches to this position at this time, since the convention of the National Association of Purchasing Agents is to be held in Chicago in 1920. Mr. Davis was formerly assistant purchasing agent for the Standard Underground Cable Co., Pittsburgh, Pennsylvania, and has been with the Belden company since 1916.

William F. Hart, who recently resigned as sales manager of the Rubber Insulated Metals Corp., Plainfield, New Jersey, has been appointed sales manager of the Needham Tire & Rubber Co. of New York, Inc., 1695 Broadway, New York City.

Harold O. Smith, formerly president of the J. & D. Tire Co., Charlotte, North Carolina, has become associated with the Ajax Rubber Co., Inc., 218 West 57th street, New York City, in charge of the company's activities pertaining to housing and general welfare work.

The estate of the late Frank Cazenove Jones, whose obituary was published in The India Rubber World, October 1, 1918, has been appraised as follows: Total estate, $117,445; cash, $14,477; personal, $3,724; stocks and bonds, $99,244. His widow, Anna M. Jones, receives $51,220; his son, Frank C. Jones, $17,468, and his two daughters, Pauline C. Chittenden and Florence C. Doughten, $16,554 each.

L. M. Bergin, managing director of the Dunlop Rubber Co., Limited, of Great Britain; Sir Harry McGowan, one of the influential directors; Captain George du Cros, manager of the works at Birmingham, and other leading men in the company, are now visiting the United States with the object of establishing a Dunlop company in America, with a $50,000,000 capital, as the chairman of the British company, A. L. Ormrod, announced at the extraordinary meeting held on December 1, 1919.

H. Cassel has been appointed manager of the New York City branch of The Portage Rubber Co., Akron and Barberton, Ohio, succeeding George H. Kiley, resigned.

Averill Tilden has been elected to succeed H. L. McClaren as a director of the Ajax Rubber Co., Inc., 220 West 57th street, New York City.

WESTINGHOUSE ALLIANCE FOR WORLD WIDE TRADE.

On his return from Europe late in October, General Guy E. Tripp, chairman of the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, announced the completion of arrangements by which a business alliance has been formed between that company and the Metropolitan-Vickers Electric Co., Limited, the purpose of which is to expand the business of the two companies throughout the world. One feature of this arrangement was the payment by the British company of between $5,000,000 and $7,000,000 to the Westinghouse company.

The Westinghouse Electric and Manufacturing Co. has taken over the plant of the New England Westinghouse Co. at Springfield, Massachusetts, and will soon have about 5,000 men at work there, manufacturing industrial motors and lighting outfits, supplementing the work at the East Pittsburgh, Pennsylvania, plant. The company has sold the drop-forging plant at Chicopee Falls, Massachusetts, which it operated as the Page-Storms Drop Forge Co., it not being adapted to the post-war needs of the company. The J. Stevens Arms Co., another Westinghouse enterprise, where rifles were made for the Russian Government, is now turning out sporting rifles, and enjoying the heaviest business in its history.

ROBERT ALLAN RETURNS TO BRAZIL.

Robert Allan, who was for many years manager of the London & Brazilian Bank at Pará, Brazil, and a well-known and popular figure in financial and rubber circles of that city, has accepted a position with the Mercantile Bank of the Americas, and sailed for Brazil last month.

Mr. Allan enlisted in the 2nd Battalion Scots Guards in December, 1917, and was severely wounded in the engagement in front of Arras. After six months in the hospital he was discharged five days after the armistice was signed.

PLANNED A SOUTH AMERICAN RAILROAD.

Señor Enrique Coronel Zegarra, for more than twenty years connected with the project of building with American capital the Paita-Maranon railroad, to connect the Amazon river with the Pacific, died recently at Lima, Peru. The proposed railroad was planned as a link in a system of transcontinental transportation, crossing the Andes from Paita on the Pacific to the upper waters of the Maranon river, which is navigable from the base of the Andes to the Amazon of which it is one of the great tributaries. President Leguia of Peru declared in his inaugural address on October 12 that the negotiations for the construction of the railway were well advanced and that it would open up a region capable of supporting a population of twenty-five million people. Señor Zegarra was formerly a member of the Peruvian Cabinet.

The number of automobile tires imported into Java and Madura during the month of August, 1919, was 18,277 as compared with 14,317 during the month of August, 1918.

From January to August, 1918 and 1919, the imports of this commodity into Java and Madura amounted to 70,708 and 149,-569, respectively.

THE NEW YORK AUTOMOBILE SHOWS.

An exhibition of the very latest advance in automobiles, their parts and accessories, both for pleasure and for commercial purposes, will appeal to the wide-awake public as few things can. There will be really two exhibitions at the same time in New York City, that of automobiles at the Grand Central Palace, and that of motor trucks at the Eighth Coast Artillery armory. They will be held on the same days, from Janaury 3 to January 10 inclusive, enabling the general public and the technical experts to visit both during their stay in the city, and to see with their own eyes the countless improvements and inventions which have been stimulated by the needs arising out of the war.

M. & A. M. A. APPOINTS FIELD SECRETARY.

The Motor & Accessory Manufacturers' Association, having found it advisable to appoint a field secretary, announces that Alexander W. Barber has been selected for that important position. By training and experience he is well equipped for this work, having been connected with the credit department of the Irving National Bank, New York City, and previous to that was a member of the inspection department of the New York Life Insurance Co.

In his new position he will travel about the country, keeping in touch with the credit managers' and other executives of the various companies of the Association, which now numbers more than 360 members.

THE RUBBER TRADE ASSOCIATION OF NEW YORK ELECTS OFFICERS AND DIRECTORS.

The following officers and directors of The Rubber Trade Association of New York were elected at the annual meeting, held November 6, 1919.

OFFICERS—1919-20.

William T. Baird, president; F. R. Henderson, vice-president; H. W. French, treasurer; A. W. Stedman, secretary.

DIRECTORS.

William T. Baird, Rubber Trading Co.; W. E. Bruyn, L. Littlejohn & Co., Inc.; H. W. Holcombe, Rubber Importers & Dealers' Co., Inc.; H. W. French, Gove & French, Inc.; F. R. Henderson, F. R. Henderson & Co.; Samuel Kubie, Raw Products Co.; Edward Maurer, Edward Maurer Co., Inc.; Frank Poel, Poel & Kelly; A. W. Stedman, Arthur W. Stedman, Inc.; William H. Stiles, William H. Stiles & Co.; C. T. Wilson, C. T. Wilson Co., Inc.

MINNEAPOLIS TRUCK TERMINAL A SUCCESS.

The "ship by truck" movement in Minneapolis appears to have become a permanent institution. After little more than one month's operation the Minneapolis Truck Terminal has had to double its floor space to take care of increasing business. Located in the heart of the wholesale district, this terminal is affording a central depot to ten motor express companies whose routes extend in all directions within a radius of 100 miles. It is the point from which incoming loads are distributed throughout the city, and at which outgoing loads are assembled.

Trucks are carrying into the city great quantities of farm produce, much of which would otherwise go to waste, and are taking back to the farmer furniture, machinery, groceries and other necessities of life. Wholesalers and merchants are lending hearty support. They deliver goods for the outlying districts at the terminal, where it is sorted and distributed to the rural express operators. It means only a city delivery for the wholesaler, while express operators find that the small charge made by the terminal company represents a large saving to them over what it would cost to run their heavy trucks over the city streets in making pick ups.

The terminal company is at present making a flat rate of five cents per hundred weight for its service, which includes obtaining new business for truck line operators, making collections and taking care of bookkeeping. Drivers are instructed to take orders from rural merchants for anything needed from wholesalers. These orders are turned in to the terminal company, and by it sent to the wholesale houses. The prevailing rates for shipments by truck are little more than the rates by freight for corresponding classifications. Taking into consideration the fact that by truck several handlings of each shipment are eliminated, that boxing or crating is not necessary, and that from two to seven days' time is saved in delivery, it is no wonder that shippers are enthusiastically supporting the "ship by truck" movement. Certainty of delivery and elimination of damage to goods in transit are other considerations that are rapidly gaining friends for the motor truck in the short haul field.

Tire and truck manufacturers, merchants, farmers and express companies have been following this venture with great interest, and its complete success forecasts the early establishment of other similar services elsewhere with profit to all concerned. Certainly extensive express trucking means greatly increased tire consumption.

HEWITT BASEBALL TEAM WINS BUFFALO CHAMPIONSHIP.

The Hewitt Rubber Co., Buffalo, New York, boasts of the prowess of its baseball team which won the championship of the Washington League of the Buffalo Municipal Baseball Association, in October, winning 16 out of the last 18 games in

THE HEWITT BASEBALL CHAMPIONS.

which it played. This victory was celebrated by a banquet given by President and Mrs. Hewitt at the Iroquois Hotel.

This victory gave the club the privilege of playing off the champions of the rival league. Two games were required, both of which were won by the Hewitts, thus making them the champions of Buffalo, and this victory was duly celebrated, closing with the presentation of a handsome watch to the manager of the club, Arthur L. Schwartz.

The club disbanded for the season, proud of its record and of the trophy and individual prizes presented at a special vaudeville entertainment given November 5. Meanwhile the bowling team and basket-ball teams of the Hewitt company are progressing well for the championship of their respective sports.

THE B. F. GOODRICH CO.'S TIRE ADJUSTMENT POLICY NOT ONLY insures the user of Goodrich pneumatic tires against imperfect tires but clearly specifies a definite number of miles he may expect as a minimum under proper usage, namely, 6,000 miles on fabric and 8,000 miles on cord tires.

THE RUBBER TRADE IN OHIO.

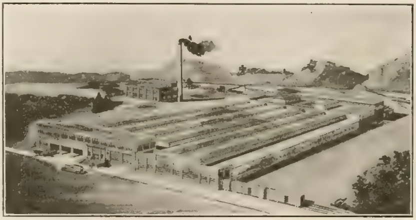
By Our Regular Correspondent.

FIRESTONE'S LATEST ADDITION.

GROUND was broken about October 1 for a new mechanical building for the Firestone Tire & Rubber Co., Akron, which, as shown by the illustration, will be a thoroughly modern, up-to-date structure, 325 feet long by 315 feet wide, and costing $400.000.

The front section is three stories high and 25 feet deep, to contain offices, locker rooms, wash rooms, shower baths, lunch room, and cafeteria. Just behind, two bays, each forty-five feet deep, with headroom under the trusses of thirty feet, are equipped with two ten-ton traveling electric cranes. The remainder of the buildings will consist of eight bays, each twenty-five feet wide, with a height of fifteen feet under the trusses. At the southwest corner is planned a forge shop 50 by 100 feet, and along the south side of the main building a storage and loading platform eighty feet long will be built.

The roof is of sawtooth construction with a northern exposure that does away with shadows. Ample ventilation, both natural and artificial, is supplied, since part of the heating system can be used to give plenty of cool air, and can be operated in the summer as a ventilating system to keep the air in constant circulation. The floor will be of wooden blocks laid on reinforced concrete, a combination which, besides being best adapted to the requirements of a building intended for mechanical purposes, is also easiest on the feet.



MECHANICAL GOODS PLANT OF THE FIRESTONE TIRE & RUBBER CO.

The equipment is to be in keeping with the modernness of the building. The machinery will be actuated by individual electric motors. This addition will be occupied by the electrical, machine, pipe, carpenter and tin shops, and almost 500 hands will be employed there. It is intended to be completed, equipped, and occupied early in the new year.

NEW FIRESTONE RIM PLANT.

Ground was broken in October at Akron for an additional $1,000,000 plant in the group of Firestone factories. The new plant will house the Firestone Steel Products Co., which annually produces approximately 1,500,000 demountable rims for pneumatic automobile tires and 65 per cent of the steel bases used in the United States for solid truck tires.

NEW PLANT OF THE FIRESTONE STEEL PRODUCTS CO., AKRON, OHIO.

The Firestone Steel Products Co., at present occupies the group of buildings which until 1910 housed the entire manufacturing facilities of the Firestone company. This group which was then too small to meet the demands for Firestone tires, is now too small to meet the demands for Firestone rims.

Firestone rims were first manufactured in Cleveland, they were of the demountable type and were soon adopted by many motor car manufacturers.

By 1910 large sizes of solid tires were coming into use and there was need of steel bases for them. As the demand promised to grow steadily, Mr. Firestone installed a welding plant as a department of the Firestone Tire & Rubber Co., where they were fashioned. Shortly afterward he decided that the company should turn out its own rims for pneumatic tires and enlarged the welding plant for the purpose.

In 1916 the demand for rims passed the 1,000,000 mark, and by May, 1918, the business had grown to such proportions that Mr. Firestone decided to form a separate company to produce rims and steel bases. The Firestone Steel Products Co. was the outcome.

The main building of the new plant will be 860 by 250 feet. Advantage will be taken of every opportunity to give the workers light and ventilation. The machinery throughout will be of the most improved type. Immediately in front of the main building will be a two-story office building, 170 by 40 feet. It will be connected with the main building by covered bridges. A cafeteria for the entire factory force will be housed in the basement of the same building.

AKRON NOTES.

The Mohawk Rubber Co., Akron, will place on the market a line of special pneumatic truck tires as soon as its additions to plant buildings and equipment are completed. Some sizes are already being manufactured.

On November 16, The B. F. Goodrich Co., Akron, through its recreational department began the presentation of a program of motion pictures in the recreation hall for Goodrich employes and their families.

The Goodyear Tire & Rubber Co. has instituted a new system, whereby it will assist its employes in starting and carrying bank and savings accounts, by attending to the details of depositing each week, in any bank, trust or loan company designated by its workers, such proportion of the weekly pay as each one may wish to lay aside, and placing in the pay envelope a receipt showing that the deposit has been made. The banks open a regular account, for each depositor, with a pass book in which each payment is credited.

This system is one which must commend itself to many thrifty and frugal workers who by this method are relieved of the necessity of going each week to make their deposits, and by which they are committed to a systematic savings plan, or to feel assured of regular payments of assessments in their building and loan associations. The system is one which might well be adopted by other large industrial establishments.

Among the organizations of The Goodyear Tire & Rubber Co.'s employes at Akron, Ohio, the "silent" base ball team, made up entirely of deaf mutes is noteworthy and is now well known throughout northeastern Ohio. Last season the team had a record of twelve victories out of sixteen games, a percentage

of 75, which shows that talk is not essential to baseball, as all the teams they met and defeated were other than mutes, and some of them were strong teams. The team has a large following among the other deaf mutes, silent fans who encourage them by rooting from the bleachers in the sign language. With the end of the baseball season the "silent" team has turned itself into a football team.

GOODYEAR'S SILENT BASEBALL TEAM

The Goodyear Tire & Rubber Co., Akron, has started a class in law in the factory school, under capable tutors.

The Goodyear Tire & Rubber Co., Akron, will build a $200,000 dormitory for girls in its employ to accommodate 175. It will be of brick, three stories high, situated in the Goodyear Heights community. The management will be in the social service department, under Miss Clara E. Bingham, and the project will be operated on a cost basis.

L. C. ROCKHILL.

L. C. Rockhill, recently appointed sales manager of The Goodyear Tire & Rubber Co., has been connected with the company for over 12 years, previous to which time he was in the advertising department of a Cleveland newspaper. His first service with Goodyear was in charge of the repair department, and he was successively made manager of the aeronautical department, manager of the automobile tire department and assistant sales manager in charge of tire sales. His promotion to his new position is a deserved recognition of his ability and his long experience in selling.

D. E. Day has been appointed manager of footwear sales for the Firestone Tire & Rubber Co., Akron. Previous to coming to the Firestone company last February, as credit man of the footwear department, he was for eight years credit man for the Mishawaka Woolen Manufacturing Co., Mishawaka, Indiana.

The B. & W. Rubber Co. is now installing machinery in its factory at Homes and Talmadge avenues, Akron, and will start manufacturing by the middle of December. The company will produce a high grade of reclaimed rubber, and will manufacture a line of mechanical goods. The officers of the company are: H. A. Backderf, president; D. M. Bauer, vice-president; George W. Payne, secretary; G. J. Carter, treasurer, and L. Bognar, purchasing agent.

MISCELLANEOUS OHIO NOTES.

The tire salesmen of the Rubber Products Co. held their annual convention at the factory at Barberton, Ohio, October 30, spending three days in discussing plans for the campaign of 1920, when the output of the factory will be doubled. One evening the company entertained the visitors, together with all the factory superintendents and foremen, at the Akron City Club, and the next evening a dinner was held at Smith's Hotel, Long Lake, one of the many lake hotel resorts near Akron. At the business and social sessions much enthusiasm was evident, and the salesmen claimed that the company would be compelled to triple its present output.

The Pearce Tire & Rubber Co., Ashtabula, Ohio, has leased its plant to The Colonial Tire & Rubber Co., Anderson, Indiana, for a period of five years, and is winding up its affairs, the Colonial company having acquired control of the plant.

The Gordon Tire & Rubber Co., Canton, Ohio, has promoted to the position of sales manager its eastern special sales representative, M. S. Lines, succeeding A. W. Senz, who recently resigned. Mr. Lines was connected for seven years with the sales department of the Michelin Tire Co, Milltown, New Jersey, previous to coming to the Gordon company.

The L. & M. Rubber Co., Carrollton, Ohio, has appointed A. W. Senz its general sales manager. Mr Senz has been with The Gordon Tire & Rubber Co., Canton, Ohio, for the last five years.

The Buckeye Rubber Products Co., National City Building, Cleveland, incorporated under Ohio laws, has acquired the plant at Willoughby, Ohio, recently used by the War Department for the development of poison gas. The main building, approximately 150 by 600 feet, will be equipped and operated for the manufacture of heavy mechanical rubber goods, under the direction of Edwin L. Stimpson, factory manager, recently superintendent of the Mechanical Rubber Co., Cleveland, assisted by Webster Norris as consulting technologist. The officers of the company are: Charles H. Roth, president and general manager; Webster Norris, vice-president and consulting technologist; James M. Mackay, treasurer and sales manager; C. V. Goepper, secretary.

The Excel Rubber Co., Wadsworth, Ohio, has increased its capital from $100,000 to $600,000. The officers of the company are: M. H. Leatherman, president; H. D. Mench, vice-president; R. M. Trump, secretary and treasurer. The directors include Charles Farr, E. J. Krabill, C. M. Wertz, F. G. Alderfer and John Manoly. The company will begin the manufacture of "Excel" tires on its own account about the first of March. It will also make a full line of accessories, such as reliners, blowout patches, hook-on and lace-on boots, vulcanizing rubber and cement.

The National Tire & Rubber Co., East Palestine, Ohio, at its annual meeting elected the following officers: C. L. Merwin, president; S. L. Warner, vice-president and general manager; C. E. Miley, vice-president, in charge of sales; C. W. Helman, secretary, and R. B. Taggart, treasurer.

R. H. Sotherland, formerly purchasing agent of The Mansfield Tire & Rubber Co., Mansfield, Ohio, has resigned to identify himself with The Columbia Tire & RubberCo., of the same place, to take effect December 1, 1919.

With headquarters at Cincinnati, L. L. Heidacher will serve the Firestone Tire & Rubber Co., Akron, as special representative in a territory extending from Sault Ste. Marie to Louisiana. He was formerly truck tire manager at the company's branch in Memphis, Tennessee.

The Glamorgan Tire and Rubber Corp., Orrville, Ohio, has increased its capital from $250,000 to $500,000. It was incorporated in October, 1918, under the laws of Delaware, to manufacture automobile and bicycle tires, inner tubes and accessories.

The McNaull Tire & Rubber Co., Toledo, has been incorporated under the laws of the State of Delaware to succeed to the business formerly conducted by the McNaull Tire Co. of the same city, the latter having gone into bankruptcy and been placed in

the hands of Frank Miller, attorney, as receiver. The new company will manufacture a high-grade cord and fabric pneumatic tire under the McNaull patents which it has acquired. The distinguishing feature of the McNaull tire is the construction of the arch.

The present plan will be immediately enlarged to increase production, and in addition to the necessary land on which to build, options on adjoining real estate have been secured. The officers of the new company are: W. D. McNaull, president; F. R. Wilhelmy, vice-president and treasurer; C. S. Wachner, secretary; directors: W. T. C. Carpenter, F. S. Gordon, Edward H. Cady, William F. Ridge, A. R. Fraser, and the president and treasurer of the company.

Work on the new power plant of The Standard Tire Co. at Willoughby, Ohio, is progressing so well that it is expected that it will be in full operation by the first of January. Cord and fabric tires are being made.

THE NATIONAL TIRE & RUBBER CO.'S GENERAL MANAGER.

S. L. Warner, vice-president and general manager of The National Tire & Rubber Co., East Palestine, Ohio, is a typical American who has risen to his present position by individual exertions and innate ability. Born in Kent, Ohio, November 9, 1868, his early education in the public schools was interrupted by the necessity of earning his living. Choosing to become a printer, he learned that trade while working on newspapers in Kent, Ravenna and Cincinnati, and a printing house in Akron, meanwhile attending night school to learn bookkeeping and commercial principles.

S. L. Warner.

Leaving the printing office, he accepted a position as bookkeeper for a local firm, and then a wholesale grocery concern in Akron, advancing until he had charge of the credit and collection department of the latter company, a position he relinquished to join the Diamond Rubber Co., Akron, first as correspondent and later in charge of the credits and collections of the eastern half of the United States.

In 1911 he came to The McGraw Tire & Rubber Co., East Palestine, Ohio, as credit manager, later becoming office manager, superintendent of branches, Pacific coast manager and then assistant sales manager. When The National Tire & Rubber Co., East Palestine, Ohio, passed to the control of the same interests as those of The McGraw Tire & Rubber Co., Mr. Warren was made general manager, and later vice-president, both of which offices he now holds.

As a citizen of East Palestine, he is noted for his public spirit, being especially active in such movements as the Red Cross, War Service Union and civilian relief organizations. He is a Knight Templar, a Shriner and a 32d-degree Mason.

A. L. PARDEE MANUFACTURERS' REPRESENTATIVE.

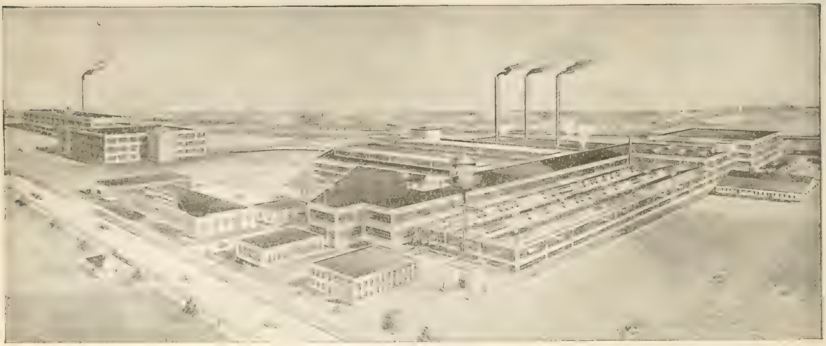
A. L. Pardee has resigned as purchasing agent of The B. F. Goodrich Co. to engage in business for himself as a manufacturers' representative, with offices at 512-513 Ohio Building, Akron, Ohio. He also expects to represent several other manufacturers of well known rubber specialty products.

A. L. Pardee.

Mr. Pardee entered the employ of the Diamond Rubber Co. in 1894 and was rapidly advanced to the position of purchasing agent. At the time of the consolidation of the Goodrich and Diamond companies he assumed the same duties with the Goodrich company. During these years he has bought almost every commodity used in the rubber industry, not only raw materials but manufactured supplies as well. For many years, however, he has specialized on textiles as applied to the manufacture of rubber goods. Much of his time will be devoted to the interests of the Brighton Mills, of Passaic, New Jersey, tire fabric manufacturers, for whom he will be western representative.

NEW DEVELOPMENTS OF THE MASON TIRE AND RUBBER CO.

The $2,000,000 cotton fabric mill, erected by The Mason Tire & Rubber Co., at Kent, Ohio, is the first tire fabric mill ever built in the Akron district, and marks the third expansion of the company in the three years since the original factory was built. The mill is constructed of concrete and steel and has 125,000 square feet of floor space. In it are embodied the most advanced ideas, both in design and equipment, known to tire fabric manufacturers. The first unit of 10,000 spindles will be



Plant of The Mason Tire and Rubber Co.

in operation in a few months, and four more such units will be provided as need requires.

The extension of the rubber plant will place the Mason company among the first five tire producers of the Akron district. Eighty thousand square feet of floor space will be devoted to rubber in the new buildings, which will give a producing capacity of about 2,200 tires, solid and pneumatic, a day. Extensions of the administrative and welfare buildings, garages and so on will be made this year, and the plans prepare for future additions in all departments. The housing of the large force of workers is also provided for, as 140 acres of land have been bought for improvement and a large number of houses have been built during the year. These are well constructed and modern and are rented or sold to employes on favorable terms.

MID-WESTERN NOTES.

By Our Regular Correspondent.

THE following appointments have been made by the Firestone Tire & Rubber Co., Akron, in the Middle West and West: L. A. Brown, special truck tire sales representative in the Northwest; C. W. Brown, office manager, St. Louis, Missouri; M. O. Halverstadt, office manager, Des Moines, Iowa; A. W. Hugh, office manager, Fargo, North Dakota; George Jacoby, office manager, Great Falls, Montana; E. A. Snyder, office manager, Minot, North Dakota; H. J. Guther, special representative for truck tire sales, with headquarters at Chicago, Illinois; George W. Keller, special representative of the new cycle tire sales department, with headquarters at Chicago, territory to include, in addition to that city, Minneapolis, St. Paul and Duluth, Minnesota; Milwaukee, Wisconsin; Des Moines and Davenport, Iowa; Fargo and Minot, North Dakota; and Great Falls, Montana.

The Pan-American Rubber Co., now of Milwaukee, Wisconsin, manufacturer of the "Parco" cellular pneumatic inner tire, is building a factory on South First street, Watertown, Wisconsin, which is expected to be occupied by the first of January, on which date the company will remove its office to the new factory address. Its leading product is an inner tire filled with a substance similar to sponge rubber, and which, because of its construction, obviates the trouble of punctures and blowouts.

The Racine Rubber Co., Racine, Wisconsin, has bought 55 acres of land in the vicinity of its factory and subdivided it into lots on which it is now building houses for 200 families. These contain six rooms each and have all modern improvements. They will be sold to employes of the company on a monthly payment basis, practically the equivalent of rent. Thirty houses will be ready for occupancy about January 1, and the balance about April 1.

The Black Hawk Tire & Rubber Co. is now equipping its factory at Des Moines, Iowa, and expects to begin manufacturing fabric and cord tires and red and gray inner tubes by January 1. The officers are: William Moran, president; John F. Griffin, vice-president; Earl A. Lewis, secretary; and J. J. O'Malley, treasurer. Paul I. Anderson is superintendent, and C. E. Reiss technical engineer.

The Haywood Tire & Equipment Co., Indianapolis, Indiana, is to build a foundry on Harding street and Pennsylvania railroad, to cost $115,000. This will be of the monitor type, 100 by 200 feet, equipped with traveling overhead crane and new machinery. A machine shop will be added, also. M. E. Haywood is president.

The International India Rubber Corp., South Bend, Indiana, is receiving bids on a factory addition one story high, 110 by 117 feet. This is one of three new additions planned.

The Kokomo Rubber Co., Kokomo, Indiana, has opened six factory branches in southern and middle-western states and has appointed Earl P. Logan director of sales. Mr. Logan was formerly in charge of the central district of the Federal Rubber Co., Cudahy, Wisconsin, with headquarters in Chicago. The Kokomo company is one of the older tire companies, having been established in 1895 for the manufacture of bicycle tires, druggists' sundries, etc. Three years after its inception, it also began making automobile and carriage tires. In the same year, 1898, it doubled its initial capital, and in 1901 quadrupled it, while in 1917 it increased it from $200,000 to $1,000,000. In the meanwhile it has established branches, incorporated as individual companies, under the laws of several other states.

Charles E. Wood, Singer Building, 149 Broadway, New York City, crude rubber broker, is opening an office in the Advertising Building, Room 1420, Chicago, Illinois, in charge of Clinton Taveniere, for the last nine years with the Goodyear Rubber Co. of New York. It is Mr. Wood's intention to get closer to manufacturers and give them prompt and efficient service, and the Chicago office is being opened with this purpose in mind.

J. B. Gabeline, president and general manager of the Standard Four Tire Co., Keokuk, Iowa, has left for an extended trip through the South. His company is showing rapid progress. Three large mills and one 68-inch calender are being installed in the new addition to the company's factory.

Plans were drawn two years ago for a $600,000 addition to the Brunswick-Balke-Collender Co. tire and tube factory at Muskegon, Michigan, but the work was temporarily held up on account of war conditions. The plans are now being redrawn on a much larger scale and ground for the new structure will be broken just as soon as the drawings are completed. The battery jar department, of which H. G. Vanderhoef was recently appointed general sales manager, has outgrown its present quarters and will be allotted larger space in the new additions.

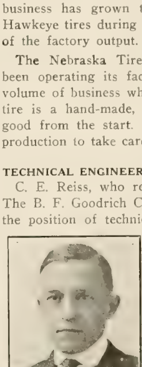
Because of expansion plans, the capitalization of the Hawkeye Tire & Rubber Co., Des Moines, Iowa, was increased on October 28 from $1,500,000 to $3,500,000, $875,000 of the increase being preferred stock and $1,125,000 common.

Work has been started on the company's new building, the cost of which will amount to approximately $350,000. The business has grown to such an extent that the demand for Hawkeye tires during the last six months has been far in excess of the factory output.

The Nebraska Tire & Rubber Co., Omaha, Nebraska, has been operating its factory night and day to take care of the volume of business which has been secured. The "Cornhusker" tire is a hand-made, extra ply, oversized tire, and has made good from the start. Plans are under way for increasing the production to take care of the growing demand.

TECHNICAL ENGINEER OF THE BLACK HAWK TIRE & RUBBER CO.

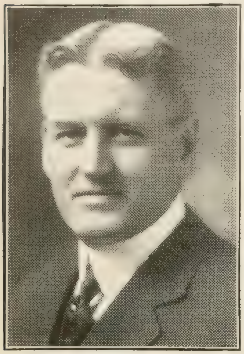
C. E. Reiss, who resigned from the chemical department of The B. F. Goodrich Co., Akron, Ohio, last September to accept the position of technical engineer of the Black Hawk Tire & Rubber Co., Des Moines, Iowa, was graduated from Ohio State University in the class of 1915, in chemical engineering. Immediately after graduation he entered the chemical laboratory of The B. F. Goodrich Co., under George Oenslager, now the company's chief chemist. At the end of the first year he began working on mechanical rubber goods under Mr. Noble of the development department and during the war worked on all gas-mask compounds in connection with factory production. Mr. Reiss' experience in these departments undoubtedly fits him excellently for his new position with the Black Hawk company.



C. E. Reiss.

PRESIDENT OF THE F. E. PARTRIDGE RUBBER CO.

FREDERICK E. PARTRIDGE, president of the F. E. Partridge Rubber Co., Limited, Guelph, Ontario, Canada, was born in Bowdoinham, Maine, in 1873, and entered the rubber industry at the age of 21 as a workman in the factory of the Maynard Shoe Co., Claremont, New Hampshire, manufacturer of tennis shoes. His aptitude for the business secured for him rapid promotion to the position of foreman and then of superintendent. Five years later he became night superintendent at the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, which position he resigned four years later, and after a short term as general superintendent of the Combination Rubber Co., Bloomfield, New Jersey, a call came to him to serve as superintendent for the Canadian Rubber Co., Montreal, Canada, of which concern he later was made manager, and still later, was elected vice-president.



F. E. PARTRIDGE.

Making a success of other people's business induced him to strike out for himself in 1915. Organizing a company under his own name, he rented a small factory at Guelph, Ontario, which has been constantly added to and enlarged until it will soon accommodate a working force of 500 people in its big, modern five-story building, the daily output of which is 475 tires, 600 inner tubes, 500 water bottles and 1,000 tobacco pouches.

Mr. Partridge is also the leading spirit in the Northern Rubber Co., Limited, Guelph, Ontario, an entirely separate concern which will soon commence the manufacture of the "Partridge" brand of rubber footwear.

CANADIAN NOTES.

THE FIRESTONE TIRE AND RUBBER CO. OF CANADA, LIMITED, has been formed in Canada, capitalized at $5,000,000, and a factory will be built at Hamilton, Ontario, where 135 acres of land have been bought. On one-half of this plot a housing plan for employes, similar to Firestone Park, Akron, Ohio, U. S. A., will be carried out, the other half being occupied by modern factory buildings constructed on the unit plan.

In addition to the products now made by the Firestone company in Akron, the Canadian organization will manufacture mechanical goods, including belting, and a boot and shoe department will probably be established. A plant for the manufacture of steel rims will also be built soon. The new company, created primarily to meet the Canadian demand for Firestone products, will also share in the company's export business, particularly that in the British Empire.

The K. & S. Canadian Tire & Rubber Co., Limited, 527 Yonge street, Toronto, Ontario, is building a modern plant.

In Kitchener and Waterloo, Ontario, as in many other industrial centers, the demand for dwelling houses exceeds the supply. The Dominion Rubber System finds that it is handicapped in obtaining the additional permanent help it needs because of the difficulty of housing them. Kitchener was unwilling to take the responsibility of building homes under the Ontario Government Housing Act, which provides for the loaning to municipalities, or to housing companies operating under municipal commissions. However, when the Dominion System offered to guarantee the city against loss, the city agreed to legalize the enterprise by appointing a municipal housing commission. The adjoining city of Waterloo asked to be put on the same basis as Kitchener, and under this agreement 200 houses will be erected in Kitchener and 100 in Waterloo, mainly for workers in the Dominion rubber plants in the larger city.

PACIFIC COAST NOTES.

By Our Regular Correspondent.

LOS ANGELES NOTES.

J. O. WARD, Los Angeles district manager of The Miller Rubber Co., reports that the growth of business in his district has made necessary the construction of a new two-story building on Hope street, the former quarters having been entirely outgrown.

Douglas Fairbanks, the well-known motion picture actor of Los Angeles, has ordered the first set of pneumatic tires to be manufactured at the new plant of the Goodyear Tire & Rubber Co. of California now under construction in that city.

The Carlisle Tire & Rubber Co., Carlisle, Pennsylvania, has appointed the Cooper & Kehler Co., Los Angeles, manager of its new branch in that city.

The Mohawk Rubber Co., Akron, Ohio, will open its new branch at 18th and Flower streets, Los Angeles, January 1, 1920.

SAN FRANCISCO NOTES.

The Braender Tire & Rubber Co., Rutherford, New Jersey, has opened a Pacific Coast branch at 133 Eighth street, San Francisco.

The Mohawk Rubber Co., Akron, Ohio, has a Pacific Coast branch at 1436 Van Ness avenue, San Francisco.

NORTHWESTERN NOTES.

A sales conference of all the Goodrich representatives of the northern Pacific Coast territory was recently held in Seattle, Washington, and over 50 salesmen were in attendance. This is one of the largest and most important territories in the Goodrich organization including the states of Washington, Oregon, Montana, Idaho, Alaska and the province of British Columbia, upwards of 282,161 automobiles being owned within its borders. W. D. Albright, northwestern manager of the Goodrich company, called the conference and presided at the meetings, during which many important matters relating to trade in the district were discussed. The rubber salesmen were given a banquet at the Butler grill together with a smoker and entertainment which concluded the conference.

The Seattle Automobile Tire Co., one of the largest individual tire retailing firms in the West, with stores in all the principal cities on the Coast, has contracted for the handling of the Ajax and Fisk tires.

C. L. Brockway has been named to manage the tire department of the United Motors Co., of Seattle, and will have charge of the distribution of Thermoid tires in the entire northwest section of the state of Washington. Mr. Brockway has been engaged in the tire business for six years, coming to Seatle from Sioux City, Iowa, last December.

THE BATAVIA RUBBER AUCTIONS, WHICH HAVE NOT BEEN HELD for some years, were resumed in October, 1919, by the Batavia Rubber Association.

THE RUBBER TRADE IN MASSACHUSETTS.

By Our Regular Correspondent.

The Massachusetts Institute of Technology, which many consider the greatest institution of its kind in this country, and in the world, has offered its services as expert and research engineer in a consulting capacity to manufacturers, upon payment of a suitable annual fee. The Institute has on its faculty many of the leading industrial scientists in this country. Annually many scientific problems are studied and worked out, and therefore the solution of many such problems which confront manufacturing establishments are already available. In brief, the Institute offers its services in a consultant capacity, on an annual salary basis, and in return for this fee will permit the firms thus retaining such services to make use of the Institute's extensive library, files and laboratory facilities, and to consult with the members of its staff and faculty on problems pertaining immediately to the needs of the client firms or corporations.

Carried to its conclusion, this plan will make the Institute one of the greatest consulting bodies in the world. Its range will cover practically every field of technical research. Through the plan those who devised it hope to see evolve a new relationship between Tech and the industrial organization of the country. American industry, they say, has long been in need of a clearing house of scientific knowledge. The Tech plan, they declare, creates a clearing house.

Almost immediately upon the announcement of this plan many prominent firms became subscribers, among the first being the American International Corp., New York; the General Electric Co., Schenectady, New York; the Simplex Wire and Cable Co., The American Telephone and Telegraph Co. and The Goodyear Tire & Rubber Co.

In Quincy, Massachusetts, where, during the World War, more than 18,000 men were employed in the shipbuilding works, there was great difficulty in housing the workmen. The Government built dormitories as well as single houses for their accommodation. Since the armistice was signed there has been a heavy reduction in the number of men employed in this work, and many of these houses became available for other workmen. Last month there was a widespread rumor that the Hood Rubber Co., of Watertown, had bought 21 of these dormitories, and land adjacent. Coupled with this was the conjecture that the Hood company would erect an extensive manufacturing plant there and give employment to a large number of workmen. Inquiry regarding the truth of this rumor elicited a distinct denial, Mr. Hood stating that there was nothing in it.

A "get-together" dinner was held, late in October, at Phillips Inn, Andover, the development of recent plans of the Tyer Rubber Co., of that town, for the establishment of a service department. The company, fifty in number, comprised the general manager, superintendent, the heads of each department, all the foremen and one or more delegates from each department of the works, the latter being elected by the workers in these departments. To emphasize the thought that all present met as employes only, place cards were drawn by lot, so that representatives of the management were seated, not as a group, but with the other employes, and the spirit of good-fellowship enjoyed by all attested the wisdom of this plan. The service manager acted as toastmaster, and the matters introduced by him became subjects for general discussion in which both management and workmen took enthusiastic part. These included the value of cooperation between individuals and the company and between department and department; the kind of goods manufactured; the use of a suggestion box, and the desirability of a definite plan for further cooperation. As a result of the meeting the plan for the suggestion box was adopted and a sub-committee from the dinner group appointed to plan a permanent service organization, to take the form of a service association, operating through a general improvement or works committee. An informal musical program by several employes added much to the pleasure of the evening.

The Cambridge Rubber Co., Cambridgeport, has let the contract for a five-story brick addition to its factory, to cost about $50,000. Each floor will be 74 by 90 feet. The new part will be devoted to the automobile top fabric and the tennis shoe departments. When the addition is completed, the company will have a total floor area of over 100,000 square feet.

The Beacon Rubber Co., Lynn, Massachusetts, manufacturer of rubber heels and fiber and rubber soles, has purchased a two-story factory building at the corner of Commercial and Bennett streets, West Lynn. The factory has a power plant connected and a floor space of about 10,000 square feet. The lot is a large one with plenty of room for additional factory space when required. Edmund J. Twomey is president of the company and James E. Connor secretary and treasurer.

The Pyrotex Leather Co. is the name of a concern recently incorporated in the sum of $50,000 to manufacture artificial leather, which has started fitting up a factory on Whitney street, Leominster, this state. Winthrop M. Mays is president; Ralph A. Robertson, secretary, and Harold A. Burdett, treasurer.

The Boston Woven Hose & Rubber Co., Cambridge, has made arrangements whereby its employes may obtain advice on all legal questions free of charge from the Harvard Legal Aid Bureau, thus saving them the expense of employing an attorney. Hours have been arranged so that the Bureau may be consulted without interfering with working hours. This will undoubtedly be of great assistance to many of the workers, and particularly so in the case of those who become victims of loan sharks, whose practices are well known to every large employer of labor.

The company will soon start classes to teach English to foreign-born employes, this also at no expense to them. The classes will be held from 12 to 1 o'clock, so as not to interfere with working hours.

The Converse Rubber Shoe Co., Malden, has purchased a large, old-fashioned estate in the residential section of that city, and will remodel the big house, modernize and furnish it to accommodate 50 persons with board and room, the intention being to run it on the club or cooperative plan to house out-of-town women employes of the company. The work of remodeling will begin soon, and is expected to be completed at an early date in 1920, and thus materially reduce the high cost of living there, for Malden, like all cities having extensive industries, is at present short of boarding and rooming accommodations, which, of course, adds to the difficulty of manufacturers in securing sufficient and efficient help.

Will diving suits of rubber be superseded by those made of brass? Last month a trial was made of a suit of that metal, weighing 400 pounds, in which the diver went to a depth of 360 feet under the surface of the sea in Boston harbor. It is estimated that at that depth the pressure was about 150 pounds to the square inch, and it is in this greater power of resistance that the metal suit is claimed to have the advantage over the ordinary rubber diving suit. As a precaution against any possible defects, which might become apparent under the increasing pressure the diver was lowered into the water very slowly, half an hour being required for the trip to the bottom. John F. Turner, the diver, has had wide experience as a diver and some years ago reached a depth of 154 feet in an ordinary suit. He says that this invention is the most nearly perfect thing of the kind he has seen. It is the intention of the inventor and the diver to attempt the salvage of $30,000,000 in gold bullion from the British steamer *Laurentic*, which was sunk off the Irish coast during the World War.

The eighteenth annual automobile show will be held in Mechanics Building, in Boston, March 13 to 20 inclusive. Approximately 105,000 square feet of floor space will be available for exhibition purposes, and the show is expected to surpass all previous affairs of the kind in this city.

Among the speakers at the banquet of the Victorian Club, Boston, in November, was Elston E. Wadbrook of MacNamara & Wadbrook, Inc., crude rubber broker, New York City.

The Firestone Tire & Rubber Co., Akron, Ohio, has appointed George M. Powell territory salesman out of Springfield, Massachusetts.

T. E. Kane, formerly chief mechanical engineer of the Plymouth Rubber Co., Canton, Massachusetts, has become associated with the sales service of the Mansfield Machine Shops, Sydney Birch Co., Mansfield, Massachusetts.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

RHODE ISLAND CONCERNS engaged in the manufacture of rubber goods of every grade and character are busy, running practically to capacity, with encouraging indications for a continuance for an indefinite period. The scarcity of skilled employes and the increased cost of materials have been handicaps that have caused the management of all the concerns considerable anxiety and trouble. Labor unrest, involving demands for increased wages, shorter hours and an occasional incipient strike, have added to the perplexities and difficulties of the general situation. Many of the companies have been making additions to their plants, while others would do so if there were favorable prospects of securing the additional labor required to operate the new machinery.

The work of improving and extending the plant of the National India Rubber Co., at Bristol, has been rapidly pushed during the past few weeks. Substantial improvements and repairs have been made on the company's wharf and other property along the water front at the foot of Church street, and arrangements have been made for burning crude oil instead of soft coal for fuel, which, it is claimed, will save the company much labor and expense. A new reinforced concrete tank, 56 feet in diameter with a capacity of 150,000 gallons, has been constructed under the surface of the ground near the boiler house, from which the oil will be pumped out and sprayed into the boilers by steam. The same boilers that have been in use for the burning of coal will be utilized with some necessary changes in the attachments of pipes.

Already the beneficial results of the day nursery that was established last spring are evident, and the great increase in the number of children left at the nursery while their parents are at work has necessitated the erection of an addition with a sun parlor 10 by 25 feet.

Among other features of the welfare work of the National Rubber Co., the Americanization of the employes is being vigorously pushed. Miss Evelyn Carter, for several years a teacher in the public schools of Bristol, has been engaged to take charge of this educational work.

Following conferences between committees representing the employes and the manager of the National India Rubber Co., the matter of establishing a company store for the sale to employes of meats and groceries is under consideration and there are promising prospects of a cooperative store being established.

The equity suit of the I. T. S. Rubber Co., of Elyria, Ohio, against the United Lace & Braid Manufacturing Co., of Providence, alleging infringement of patent rights on a rubber heel, has been assigned for December 29 in the United States District Court for the District of Rhode Island.

The Davol Rubber Co., Providence, Rhode Island, has announced the following promotions and changes in its personnel: R. J. Fries, manager of sales in addition to being advertising manager; Walter L. Davol, assistant sales manager; J. A. Clemens, recently returned from service with the American Army of Occupation at Coblenz, production manager; Jesse Little, production superintendent; and T. B. Dowling, factory foreman.

The George Grow Tire Co., Providence, manufacturer of fabric and cord tires, has enlarged its local retail and wholesale store, and will occupy the premises at 67 to 75 Exchange street as an office and salesroom.

The K. & C. Tire & Rubber Co., which recently opened its manufacturing establishment at 13-15 Calender street, Providence, is headed by Cornelius F. Kelleher, manager, and James H. Creamer, treasurer. Both young men were recently discharged from military service. Mr. Kelleher was for eight years employed by the Sterling Tire Co., where he served as chief chemist. He was also employed in a similar capacity by the United States Rubber Co., at its Valley street plant. The company manufactures both cord and fabric tires, inner tubes, repair stocks and vulcanizing cements. A cheaper but longer life inner tube will soon be placed on the market.

Samuel P. Colt, president of the United States Rubber Co. and of the National India Rubber Co., its Bristol subsidiary, on Thanksgiving Day telegraphed Daniel Frohman, president of The Actors' Fund Home, West New Brighton, Staten Island, New York, his subscription of five thousand dollars as a "Rhode Island Thanksgiving offering to the Actors' Fund of America," for which contributions are being asked.

The Collyer Insulated Wire Co., Pawtucket, Rhode Island, is building a two-story concrete addition, 120 by 60 feet, to cost approximately $50,000.

Two three-story brick buildings on Main and Carver streets, Pawtucket, 60 by 160 feet, are to be erected by the Tubular Woven Fabric Co. It is expected that the structures will be ready for occupancy in about five months. Both will be equipped with modern machinery and will be used in the manufacture of electrical insulation covering.

The O'Bannon Corp., manufacturers of carriage cloth at West Barrington, has commenced fitting up a new restaurant on the second floor in the main building of its factory for the accommodation of the office force.

The Lynn Rubber Co.'s plant at Warren is very busy on orders for rubber heels. Since the factory was first opened less than a year ago there has been a constant increase in the number of employes and it has been found necessary already to make additions to the equipment.

THE RUBBER TRADE IN NEW JERSEY.

By Our Regular Correspondent.

TRENTON NOTES.

THE rubber manufacturers of Trenton report that the early winter finds the trade very brisk with prospects for a good season. All the tire concerns are very busy and expect to continue so through the winter. One prominent manufacturer informed a representative of THE INDIA RUBBER WORLD that the mechanical rubber business had lately improved 100 per cent.

Some of the Trenton rubber manufacturers were represented in the parade held in celebration of Armistice Day. The Joseph Stokes Rubber Co. captured the second prize of $25 for heavy truck floats. The float, which was brilliantly lighted, was entitled "Peace, Honor and Purity." A number of the girl employes of the plant wore appropriate costumes. Other rubber concerns also had floats.

The Ajax Rubber Co., Inc., Trenton, has purchased five

dwelling houses adjoining the plant on North Olden avenue and will later have them razed for the purpose of building an extension to the works.

Sixty employes of the Ajax Rubber Co. have recently taken out naturalization papers at the Mercer County Court House, making the company 100 per cent American. English classes will be opened for the men in the Ajax plant.

The two-story brick plant of the Puritan Rubber Manufacturing Co., situated at the foot of Perrine avenue, Trenton, was destroyed by fire early on the morning of November 17. The blaze started in the packing room and was of unknown origin. The Puritan Rubber Co. recently changed hands and is now owned by Boston business men. The concern manufactured mechanical rubber and molded goods and had a large stock on hand. All the office effects not in the safe were destroyed, and the machinery was wholly ruined. The company officials have not yet decided on rebuilding plans.

The Delion Tire & Rubber Co. has filed a certificate of dissolution in the office of the Secretary of State at Trenton. The plant of the company was recently taken over by the Bergougnan Rubber Corp., of which details were published in The India Rubber World, September 1, 1919.

Walter C. Price and associates, Baltimore, Maryland, have bought the business, name, good-will, trade-marks, etc., of the Delion company, which has been reorganized with the same name under the laws of Maryland, with offices at 131 West Mt. Royal avenue, Baltimore. A modern factory will be built, having a daily capacity of 400 tires, and high-grade fabric and cord tires and tubes will be made.

Fay, Miller & Youngs, manufacturers of druggists' rubber sundries, with a factory at Barberton, Ohio, has purchased the plant of the Fidelity Pottery Co., at Trenton. The property consists of three buildings of 50,000 square feet of floor space, and a good portion of land. The company is making a number of alterations, and when these are completed the machinery and equipment of the Barberton plant will be removed here and that plant closed. The officers of the company are: Charles L. Fay, president; Arthur M. Youngs, vice-president; Merle L. Youngs, secretary and treasurer, and Fred H. Miller, assistant secretary and treasurer. The company has offices at 75-77 Spring street, New York City.

MISCELLANEOUS NEW JERSEY NOTES.

The Duratex Co., 768 Frelinghuysen avenue, Newark, manufacturer of rubber goods, will expend about $300,000 for construction and about $200,000 for equipment in a series of buildings to be erected. The company has a tract of seven acres of land and will erect nine buildings. The main factory building will be 100 by 500 feet. The storage building will be 200 by 60 feet, two stories high. The laboratory will be 40 by 40 feet. There will also be an addition to the power plant.

Vice-Chancellor Backes has granted an order directing parties in interest to show cause why Elgin L. McBurney, of Jersey City, receiver for the Indian Tire & Rubber Co., of New Brunswick, should not be permitted to accept a bid of $50,000 for the company's business and assets. The concern manufactured solid rubber tires for trucks. Mr. McBurney was appointed receiver last May in a proceeding instituted by Bilder & Bilder before Vice-Chancellor Lane in behalf of Virginia A. and Rose L. Cavagnaro, of New York, stockholders and creditors of the company. Immediately after Mr. McBurney's appointment, the corporation's directorate, in violation of an order restraining the corporation from the exercise of its franchise, had counsel file a voluntary petition in bankruptcy, with the result that certain directors were adjudged in contempt. No penalty was ever imposed, however. In the schedule incorporated in the bankruptcy petition, the liabilities were put at $94,118.74, while the assets were inventoried at $121,614.87, the principal items being real estate, $39,000; machinery, $37,000, and material on hand, $20,000. The corporation was said to have $167,700 of capital stock outstanding.

The Jenkins Rubber Co., Elizabeth, New Jersey, has made arrangements to take over the brass founding section of the Crane Co.'s plant at Bridgeport, Connecticut, where formerly much of the metal parts of their valves were manufactured under contract. Business with the company is reported excellent.

George W. Johnson, for some years a salesman in the employ of the Lambertville Rubber Co., died at a Trenton hospital on November 12 after an illness of several weeks. The deceased was 39 years old and a member of the Citizens' Band of Lambertville and New Hope. He is survived by his widow. Mr. Johnson was born at Flemington, this state.

The Victory Tire & Rubber Co., Asbury Park, New Jersey, has changed its name to the Rydon Tire & Rubber Co.

The Stanwood Rubber Co., Newark, New Jersey, has acquired the majority of the stock of the Hardman Rubber Corp., New Brunswick, New Jersey, and has completed arrangements for the distribution of the Stanwood company's output in twelve different cities through branches, in addition to twenty-four other retail distributers.

The Overland Tire Co., formerly at 15-25 River street, Newark, New Jersey, has removed to Cortlandt and Holmes streets, Belleville, New Jersey.

The Okonite Co. has established its executive offices at its factory at Passaic, New Jersey.

The Braender Tire & Rubber Co., Rutherford, New Jersey, has transferred its advertising account from the Manufacturers Publicity Co., 30 Church street, New York City, to Collin Armstrong, Inc., 1463 Broadway, to which all correspondence concerning advertising should be addressed.

EASTERN NOTES.

The Pennsylvania Rubber Co., Jeannette, Pennsylvania, has made arrangements for displaying its products in five rooms on the northern end of the Garden pier, Atlantic City. C. B. Williamson will be in charge.

The Kelley Tire & Rubber Co., 962 Chapel street, New Haven, Connecticut, has purchased land and expects soon to let a contract for the erection and equipment of a plant costing about $250,000, for the manufacture of Kelley Kord and Kelley K tread tires and Kelley Blue tubes. Edward J. Kelley is president and the other officers are: Charles H. Bortelle, Jr., vice-president and treasurer, and William F. Alcorn, secretary.

The Goodyear Cotton Mills, Inc., Killingly, Connecticut, is planning another cotton mill of 30,000 spindles, 140 by 430 feet, two stories in height, to balance its weaving capacity. Yarn is now being bought in anticipation but contracts have not been let. The new unit will require about 60 additional tenements for housing employes.

E. I. du Pont de Nemours & Co. (incorporated), Wilmington, Delaware, has bought about 65 acres of land near Baltimore, Maryland, for storage purposes.

The Reliance Tire & Rubber Corp., Wilmington, Delaware, has been authorized to do business in the State of New York, capitalized at $250,000. E. Holway, 50 East 42d street, New York City, has been appointed representative.

The Oldfield Tire Co., Cleveland, Ohio, has been authorized to do business in the State of New York, with a capital of $500,000, and has appointed R. L. Mills, Bush Terminal, Brooklyn, New York, its representative.

The Rochester Tire & Rubber Co., Rochester, New York, has increased its capital from $500,000 to $750,000.

The National Wholesale Druggists' Association held its forty-fifth annual meeting at the Hotel Grunewald, New Orleans, Louisiana, November 3-7, inclusive. Among those present were the following representatives of the Davol Rubber Co., Provi-

dence, Rhode Island, manufacturer of druggists' rubber sundries; P. R. Wesley, general manager; E. J. George, Chicago office; G. A. Sheehan, San Francisco office; E. G. Hartwell, southwestern representative; and John A. Burgess, southeastern representative.

The Record Tire & Manufacturing Co., a Delaware corporation, has dissolved under the laws of the State of New York, but has been authorized to do business in that state through its representative, H. F. Hartjen, at 238 West 53d street, New York City.

The Seamless Rubber Co., Inc., New Haven, Connecticut, has its new $2,000,000 plant well under way and has sold the property on Hallock avenue, where it is building, to trustees for the Seamless Rubber Associates, Inc., who, in turn, have leased it to the Seamless Rubber Co., Inc., for twenty years at $72,000 annually. The property is now being connected with the New Haven railroad by a spur track. It fronts on the harbor.

The Amalgamated Tire Stores Corp., whose organization was noted in our issue of November 1, 1919, has leased the five-story building at 1974 Broadway, New York City, for its general offices and eastern distributing point, and will open about thirty stores in other cities.

The Kokomobile Tire & Supply Co., Buffalo, New York, has been organized to distribute to the retail trade in western New York and northern Pennsylvania the products of the Kokomo Rubber Co., Kokomo, Indiana, including bicycle tires, and the Wright & Ditson-Victor Co. sporting goods lines. C. W. Barrell, formerly with The B. F. Goodrich Rubber Co., Akron, Ohio, will manage the concern; G. B. Wilkins, of Indianapolis, will have charge of sales. and R. V. Henery, of the office and direct advertising.

The Middletown Rubber Co., Inc., 280 Broadway and 5 Columbus Circle, New York City, has secured a most desirable site for a factory on the main line of the Erie railroad, at Middletown, Orange County, New York, and plans to erect there a factory for producing cord tires. The officers of the company, which was incorporated last August with an authorized capital of $1,000,000, are: Myron J. Friedman, Chicago, Illinois, president; William Rusnak, Chicago, vice-president; S. A. Thompson, Cleveland, Ohio, secretary; and J. T. MacDonald, Cleveland, treasurer and general manager.

The New York Asbestos Co., formerly at 203 Front street, New York City, has removed to 394 Canal street, where it has leased a six-story loft building for a term of years.

The Universal Rubber Products Co., J. B. Topham, president, has completed the equipment of a modern tire manufacturing plant located at Zelienople, Pennsylvania. The output will be tubes and unguaranteed tires. Manufacturing operations will begin December 1, 1919.

The General Electric Co., Schenectady, New York, has completed the erection of an extension 100 by 100 feet, which has been added to building No. 89.

The Motor and Accessory Manufacturers' Association, Aeolian Building, New York City, has arranged for its members to participate in the show of the Minneapolis Automobile Trade Association, to be held from January 31 to February 7, 1920. In addition, shows at New York, Chicago, and Boston have been sanctioned by the M. & A. M. A., the largest number of official automobile shows ever sanctioned in any one year.

Plans of the Beacon Tire Co., Beacon, New York, for the coming year include the eight-hour day, an attractive insurance feature free to employes, a bonus system embracing all workers, athletic games and meets, etc. The new building will soon be completed and new machinery installed.

A. Schrader's Son, Inc., Brooklyn, New York, manufacturer of tire valves, gages, etc., is building a new ten-story building of concrete and steel construction, 90 by 196 feet, to be adapted for the operation of heavy machinery on every floor and to be equipped with automatic sprinklers, stand-pipe connections to street with outlets on each floor to the two stair towers, sprinkler tank on roof cross-connected with sprinkler tank on Building No. 1, Manhattan district fire alarm system, hospital for employes, lunch rooms, lockers, a library, etc.

The J. & D. Tire Co., Charlotte, North Carolina, has changed its name to the McClaren Rubber Co., from the name of its president, H. L. McClaren. The plant will be enlarged and distribution organized in the principal cities.

The Pan-Rubber Products Co., 311 Steinway avenue, Long Island City, New York, has been established as a retail store to sell well known brands of rubber goods to small consumers who cannot buy direct, and to act in an advisory capacity to firms requiring special goods. F. K. Bodenschatz is president and general manager.

The Polack Tire & Rubber Co., has transferred its general office from Broadway and 62d street, New York City, to its factory at 145 Howard avenue, Bridgeport, Connecticut.

PROSPECTIVE VALUES OF RUBBER.

The question of the valorization of india rubber is considered again in *"Le Bulletin de l'Association des Planteurs de Caoutchouc,"* of Antwerp, which regarded it as not practical in 1913. Valorization now is made to mean not merely the fixing of the standard price by the government, by buying the surplus crops or otherwise, but the regulation of prices by any combined effort such as that of trusts or associations and by any means, such as the restriction of output or exportation which the Rubber Growers' Association tried to put through with the plantation rubber of the British Far East in 1918.

The *Bulletin* has examined market conditions and believes that under present conditions there is no prospect of a need of restriction. So long as the London price does not fall below two shillings a pound, with the increased demand there seems to be no danger of overproduction for two or three years, at least, even if the Brazilian cost price were reduced far enough to allow the Pará sales to rise to 35,000 or 40,000 tons again. It seems a proper time to put the plantations in order, to improve the trees and the cultivation and not worry over valorization.

The London prices for the highest grades for future delivery in the first six months of 1920 went as high as 2 shillings 4¼ pence; first latex crêpe rose from 22 pence in June to 28 pence in September, while hard Pará in the same period went up only a half penny, and the better grades of plantation are taking its place. It will not be surprising if the curve of plantation prices does not again rise as high as that of Pará prices. The stocks in Europe and Malaya are in hands that are able to hold them. The formidable increase in consumption in the United States indicates that the Malay production will be absorbed into a regular channel, and the market pays no heed to the steady increase in Malayan production.

With regard to the establishment of new markets in Europe for the sale of rubber the *Bulletin* quotes a specialist's opinion. He believes that the change made during the war, by which the great increase in the United States demand was supplied by sales and shipments direct from the Straits, renders the success of new markets doubtful. London must retain its place as the center for future sales, while Antwerp and Hamburg are favored by their geographical position. A few years before the war broke out France tried to establish a rubber market at Havre, counting on regular shipments from the French Congo, but the experiment was a wretched failure. Any market scheme counting on the importation of wild rubbers by the countries whose colonies produce it, seems likely to fail because the impurities of those classes of rubber increase the relative cost of importation and diminish their usefulness so that dealings in them will become steadily less remunerative when competing with lower-priced plantation rubber.

The Rubber Trade in Great Britain.

By Our Regular Correspondent.

The position of affairs remains much the same plenty of orders on hand and difficulty in executing them, owing to strikes in this or that direction. Transport and the delivery of letters were much hampered by the nine-day railway strike, which undoubtedly owed its collapse to the rapidly improvised motor truck service all over the country. The strike of iron molders, which lasted three weeks, caused serious delay in the engineering trades, and rubber works in course of installing new machinery have had a serious setback.

DETERIORATION OF RUBBER.

It is not often that rubber works keep their purchases of plantation rubber for three or four years without turning the rubber out of the boxes for use or inspection. I had a case of this sort before me recently, however, when it was found that the rubber was very much decayed and quite unfit to be used for a good class of work. I do not suppose the seller would be prepared to consider redress after three years, though, I hardly think that much good quality plantation rubber will be found to have gone wrong even if it is kept for three years. I have reason to suppose that in this case the rubber which was sold as clean brown crêpe was not *Hevea* rubber but the product of some other tree which yields a rubber more prone to decay. I do not know that it is always customary for the term *Hevea* to be used in dealings between buyer and seller, and the point seems one of importance as premature decay of the rubber after manufacture might lead to considerable trouble. This would be especially annoying to firms with a reputation and desirous of buying a high quality rubber for import.

BENZOL POISONING IN PROOFING.

In the Factory Inspector's Report for 1918 reference is made to several cases of poisoning by benzol fumes, two or three of which proved fatal. I remember that early in that year all rubber works received an official request to state whether they used benzol in their establishments, though the reason for the inquiry was not stated. Speculation, therefore, was rife on the matter which it was thought had something to do with attempts to cheapen production of government munitions by the use of benzol at a low controlled price instead of solvent naphtha at over 4 shillings per gallon for which it was then selling. However, it is now clear that the inquiry was on hygienic grounds only. As a solvent in proofing, benzol has never been popular because of its high volatility, as compared with solvent naphtha, and because a solvent boiling at a uniform temperature does not give as good results at one boiling over a range of 30 to 40 degrees, such as solvent naphtha. In the case of rubber solutions as distinct from rubber "doughs," volatility has always been a desideratum, and it has been a common thing to use a mixture of solvent naphtha and light petroleum spirit.

It would seem from the reports of the fatal cases that these need not have occurred if there had been proper ventilation of the work rooms. It is now recognized by the Factory Inspection Department that the alternative for forbidding the use of benzol in rubber works is the installation of efficient ventilation, and this requisition seems now to have been generally and readily complied with by the manufacturers. Now that benzol has risen in price and the sale is controlled by a ring of producers, mainly for motor purposes, I doubt if it will continue to find its war-time uses in rubber works.

The report contains an interesting reference to a new rubber solvent which was recommended to the trade by a government department in 1918. It is a xylol compound, stated to consist half and half of hexamethylene and metexylol. Members of the Medical Research Committee reported that it could be used as a rubber solvent with much less danger than benzene.

NORTH BRITISH RUBBER CO., LIMITED.

The profit to the North British Rubber Co., Limited, for 1918, after making allowance for excessive profits duty, was £180,512, and with the balance brought forward there is £145,842 for disposal. It goes without saying that the profits were maintained despite the fact that labor, coal and all other charges showed an increase. This is almost the univarsal case with reports of manufacturing businesses at the present time.

The report states that since the signing of the armistice, and notwithstanding the cessation of practically all war contracts, the output of the works has not been seriously affected. Certain important resolutions referring to alterations in the articles of association and to the increase of capital are to be submitted to an extraordinary general meeting of shareholders. It is proposed to transfer to reserve £100,000 in respect to depreciation previously debited to profit and loss in excess of what was necessary, and to capitalize that amount by issuing fully paid shares to the ordinary shareholders on the basis of two shares of £1 for each ordinary share of £5, it being proposed to divide these £5 shares into £1 shares. It is further proposed to issue £150,000 ordinary shares at a premium of 2*s.* 6*d.* per share in order to develop the productiveness of the works.

RUBBER RESEARCH ASSOCIATION FORMED.

The Research Association of British Rubber & Tyre Manufacturers was registered in London on October 9, 1919 as a limited liability company, not joined for purposes of profit. Its objects are to promote research and scientific work that may be of use to the rubber, tire and kindred industries. The number of members is declared to be 200; they are divided into ordinary, associate and honorary. The association is to be run by a board of managers, and care is taken in the articles of incorporation to keep out foreign control.

ABNORMAL DEMAND FOR TIRES IN ENGLAND.

There is an abnormal demand for motor tires in England, owing to the railroad strike during which the wear and tear on the tires of the cars used for transportaion was very great. The shortage is likely to continue for some time. It is understood, also, that Germany is going to set up motor transportation on a large scale, as the German railroads are badly worn out. This would call for something like 20,000 tons of rubber for tires, which would have to be imported from the United States and England.

G. E. C. RUBBER-COVERED CABLE.

The Pirelli general cable works at Southampton, England, is producing G. E. C. tough rubber-covered cable in all sizes—single, twin or three-cored, which is particularly suitable where a flexible cable, likely to be subjected to rough usage, is needed. Each core, of the best H. C. tinned copper wire, is insulated with vulcanized india rubber, and the whole is then sheathed with tough rubber that is water, oil, alkali and acid proof, and will withstand the roughest use that can arise in industrial work. It can be put directly into new plaster when used for house wiring. On account of its peculiar qualities the Institution of Electrical Engineers provides in its wiring rules for the employment of that cable

RUBBER SPONGE MANUFACTURE IN FRANCE AND AMERICA.

According to A. Hutin in *"Le Caoutchouc et la Gutta Percha,"* the manufacture of rubber sponges, which flourished chiefly in Germany before the war, has been commenced in France.

There are numerous recipes both for the rubber compound and for the liquids utilized to produce the spongy effect by liberating gases during vulcanization that form bubbles of uniform size distributed equally throughout the mass. One of the best compounds follows: Pará rubber, 460 parts by weight; golden sulphuret of antimony, containing 2 per cent of free sulphur, 60 parts; washed chalk, 90 parts; lime, 1 part; sulphur, 30 parts; carbonate of magnesia, 20 parts; lithopone, 150 parts; zinc white, 79 parts; barium sulphate, 40 parts; wheat starch, 40 parts; olive oil, 15 parts; castor oil, 15 parts.

The rubber is worked between slightly warmed rollers for four to five hours to render it quite soft. Mixing takes an hour, as follows: the softened rubber is first treated with the mixed oils added in small quantities, then the starch is added, next the intimately mixed ingredients and finally the sulphur constituents.

The liquid for causing the formation of bubbles is composed of 90 per cent alcohol, 120 parts; aniline blue, 1 part; amyl acetate, 2 parts. The mixer rolls are kept well cooled and run slowly to reduce loss by volatilization, the liquid being sprinkled on the mass by degrees. If added too quickly the liquid does not become intimately incorporated with the mass. About 40 to 45 minutes is the average time required. The mixing rolls are set close together and later the distance is gradually increased. Air bubbles must not be allowed to occur in the mixture or unduly large cavities will be formed thereby during vulcanization.

The mass is next made up into rectangular cakes about 1⅛ by 1⅜ by 2¼ inches in a press, the dimensions being such that the cakes do not come in contact with the walls of the vulcanizer. The thickness of the cakes is important. If too thick, vulcanization may be imperfect; if too thin, an overcure may result. The forming press must be kept cool and the cakes vulcanized at once on removal from it. The upper surface of the cake is wiped with benzine and painted over lightly with oil, while the lower is merely oiled and the sides covered with silk paper.

The vulcanizer is of rectangular section and jacketed for steam, which is admitted at a pressure of 65 to 70 pounds per square inch for fifteen minutes before vulcanization is begun. The cake is then laid on a piece of wire gauze in the vulcanizer and covered with a light cotton fabric. Vulcanizing time and conditions must be ascertained by practical experience. Steam must not be allowed to come in direct contact with the cake.

AMERICAN METHOD.

In general, American practice in the manufacture of rubber sponge follows that recorded above. It was developed first in the laboratory of The B. F. Goodrich Co. at Akron, Ohio, shortly following the appearance of the first commercial rubber sponge which originated in Russia in 1897.

It is found advantageous to set aside the rubber sponge mixing to age for several days; even as long as a week or ten days does no harm. The inflating material commonly used is carbonate of ammonium in powder form.

In preparation for vulcanization the stock is run out by a tubing machine in the form of a bar of appropriate cross-section to inflate to the thickness of sponge desired. The raw stock is cut approximately one-third the bulk of the cured product and laid in an aluminum trough for curing in open steam.

Before vulcanization is begun the heater is charged with air at 45 pounds' pressure, which pressure is subsequently gradually displaced with steam pressure, to be later still displaced by air pressure under which the cured sponge is held until cooled sufficiently to obviate all danger of internal splitting.

As soon as removed from the vulcanizer the thin skin or surface of the bar of spongy rubber is promptly broken to prevent damage by excess internal pressure. The walls of the sponge cavities are systematically broken by passage of the cured bar of sponge through an ordinary clothes wringer. This establishes connection with the outer air throughout the mass and renders the finished sponge light and absorbent.

The sponge is completed by cutting it from the cured rough form by means of a hand cutting die, after which the outer skin or surface rubber is removed by a machine knife with rapidly revolving blades somewhat after the style of a lawnmower blade. By properly housing the blade of such a cutter it is possible to remove the surface from the sponge by simply passing it lightly over a suitable opening which permits the blade to come into contact with the rubber.

THE GERMAN RUBBER MARKET.

In an article on the development of a German rubber market, the *"Gummi-Zeitung"* comments on the experiences of the German rubber industry during the war. German's rubber industry in the year 1913 worked up in round numbers 16,000 tons of rubber, of which a third was exported in the form of rubber goods. During the war as time went on the boundaries were closed more and more to the importation of rubber. If the industry in spite of the steadily increasing demands of the army was able to satisfy them, this was due to three circumstances:

(1) Certainly hitherto no substitute material had been found which in any degree possesses the quality of natural rubber and could compete with it, but certain materials have value as helping Para rubber as additions and their use in special cases will continue even after the war. Still, when great demands are made on the materials they cannot take the place of new rubber. In other cases the Germans set aside rubber entirely and used other materials in its stead (as in the case of elastic metal tires).

(2) The working up of old rubber was improved and for this reason we may expect in the future a saving in rubber, as we have not yet got the ideal regeneration process and for good material we must in the future turn to new rubber.

(3) An important part in the German rubber economy was played by synthetic rubber, which was prepared in the last year of the war to the amount of 2,000 tons. This is the methyl rubber of the color factory formerly Friedrich Bayer & Co. in Leverkusen, which to be sure can be properly used in hard rubber goods only. But during the war they have succeeded in making progress in the preliminary for the manufacture of better kinds of artificial rubber. They have learned to prepare acetone out of calcium carbide and further isoprene out of acetone and setacetylene. There is no doubt that German science working on a scientific basis will become master of the difficulties in case it has an inducement to continue on the way it had entered upon.

What seems to be the future of the rubber market? In answering this question we must consider that the production of rubber and still more the consumption of rubber is very extensible. If there is a shortage of rubber and prices rise, the plantations can increase their tapping and all sources of rubber which are stopped up now by low prices will flow again. The consumption can be easily limited by substitute and the increased preparation of old rubber. On the other hand, if the market is flooded the plantations can limit their production and a few wild rubbers like the African will be more or less driven out while the consumption on account of the many ways in which rubber can be utilized will quickly increase. These means of regulating will apparently give the rubber market a certain steadiness.

Variations in price and surprises such as marked the period of the rubber crisis of 1913 may for the present be disregarded. Thus, in the rubber market in London in the first half-year of 1919, prices are steadily held to the line of development around

2 shillings a pound for first latex crêpe. This price leaves to the plantations in so far as they are not overcapitalized, a good profit, for the cost of production is only from ½ to 1 shilling a pound. The production for coming years is estimated at 300,000 tons for 1919 and 340,000 tons for 1920. The consumption, too, should increase in proportion since without considering the possibilities for new means of utilizing rubber, a greater extension of the automobile industry as well as of airplanes and balloons is to be expected.

Germany possessed before the war an important market for middle-class rubber in Hamburg. Since 1911 the future business in actual goods had become possible and it was planned to extend the market by establishing a time exchange for rubber. It is impossible to continue these efforts on account of the lack of money and ships in Germany will have to turn to foreign markets for the supply of its rubber needs. Probably Eugland will be ready to deliver the crude material under favorable and easy terms the more because there is rather an abundance than a lack of it.

The London market will be strengthened in its contest with New York if the Central Powers could be counted on as customers. On the other hand, too harsh conditions would drive German buyers to other markets like Amsterdam, Antwerp and especially New York and to the further perfection of the working up of old rubber, rubber substitutes and artificial rubber.

A RUBBER SUNDRIES ASSOCIATION.

The Central Union of the German Surgical Rubber Goods Trade was formed on October 11, 1919, at Frankfurt am Main. It includes three sections: wholesale dealers, retail dealers, and exporters, and hopes to take in all firms engaged in the business. The president is A. Ederheimer, of the house of Gebrüder Weil in Frankfurt, and the manager is Dr. Ernst Mosbacher, also of Frankfurt. The office is at 42 Hochstrasse in that city.

BELGIUM'S RUBBER COMMERCE.

Belgium in the first seven months of 1919 imported 5,525,715 pounds of rubber valued at $2,877,084 at normal exchange, and exported 244,196 pounds worth $175,096. She also imported rubber tires valued at $2,580,153, and other manufactured rubber goods valued at $720,018.

ANTWERP RUBBER AUCTIONS RESUME.

Proof that the Antwerp rubber market is once more in full swing is shown by the list of lots sold at auction by the well known commission house, Grisar & Cie., on November 11, Armistice Day. They amounted to 1,415 tons of Congo rubber of all grades, with a small quantity of other African rubbers and were offered chiefly by the noted firms, Société Coloniale Anversoise, Bungé et Cie. and Crédit Colonial & Commercial, which was formerly L. & W. van der Velde, with a few lots from Osterrieth & Cie. and Willaert Frères. The bulk of the rubber is made up of red Congo Kassai and upper Congo, équateur black and red, though a little lower Congo appears. The quality indicated by the valuation ranges from 2.75 francs to 5.70 francs a kilogram, but for the great mass of the rubber ranges between a little below and a little above 4.50 francs a kilogram, or around 40 cents a pound.

RUSSIAN RUBBER FACTORIES AT WORK.

At the present time three of the national rubber factories of Russia, formerly known as the Treugölnik," the "Bogatyr" undertaking and the "Kautschuk," are actually working and turning out mechanical rubber goods. They have received extensive and firm orders from the railways, the sugar industry, the Commission of Health and other services. Their stock of raw material will presumably suffice them for one year on a severely restricted scale.

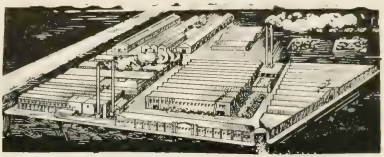
The position as regards fuel is bad. The "Treugölnik" factory has had its stock of fuel commandeered by other works, such as the electrical power station. In this large factory, intended to employ 18,000 workers, there are now only 4,500. Rubber is being used for shoe soles as a substitute for leather.

THE RUBBER TRADE IN AUSTRALIA.

Special Correspondence

Rubber manufacture in this part of the world is steadily increasing its output and broadening its market. There are three rubber factories in Australia and these are in a very satisfactory position financially, and in regard to the quality of their goods and the standard of their output.

The pioneer is the Barnett Glass Rubber Co., the year of whose formation dates back to the 'seventies. It is to-day in a healthy condition, testifying to the perseverance of Mr. Barnett



The Barnett Glass Rubber Co., Limited, Melbourne.

Glass, the founder, and his coworkers, through the many vicissitudes that have been the lot of the rubber industry here in Australia. While the Barnett Glass company was making a beginning in manufacturing waterproof goods the Perdreau Co., as rubber merchants in Sydney and soon after as an incipient manufacturer in Melbourne, was also helping to start the rubber industries of Australia.

The Dunlop Co. of Australia, which had its inception in Melbourne as an agency of the British Dunlop company in the late 'nineties, also began to manufacture on a small scale. Its factory last year employed 3,500 hands, imported 70 tons of rubber a month, and turned out more than a thousand different kinds of rubber goods. Tires are of most importance, as is the case with all the Australian manufacturers, and the company also makes a special conveyor-belting.

It has been the desire of manufacturers here to supply, regardless of expense and inconvenience, any rubber article that the market may demand, and in this they have been successful. At the outbreak of the war they readily came to the country's aid and accommodated themselves to making the particular rubber goods necessary for carrying on the war. The result was that the Department of Defense has no anxiety regarding these articles and were sure that any demand would be supplied.

The use of plantation rubber is being largely extended here, and satisfactory results are obtained. The need for scientific research is fully recognized by manufacturers, and in order to be in position to manufacture any of the many rubber articles in existence it is obvious that much experimental work is necessary.

The lot of the rubber manufacturers in Australia is not an easy one, for difficulties and obstacles are many. The characteristic resourcefulness, determination and enterprise of the Australian manufacturer was never called into play more than in the establishment and successful carrying on of the industry. One of the handicaps is that the home market is limited, making the initial cost so great that a long interval must elapse before a reasonable profit is obtained. Added to this is the distance from the continent whence the raw products must be obtained, and the high price of labor. These factors make competition with importers difficult and the exportation to other countries scarcely possible.

Congo Rubber a Big Asset of Belgium.

By S. P. Verner.

Her Congo Colony may become one of the most valuable assets of Belgium in her efforts to rebuild her once flourishing trade and industry. The chief point to be observed by the Belgian Government in its colonial policy is to conserve and develop the labor of the natives. Failure to do this was the weak point in the old régime ten years ago, but now King Albert may be expected to inaugurate a system which will correct past mistakes and make Belgium's big African territory a source of wealth to both Belgium and the natives of the Congo.

The principal needs of the Congo are three: an adequate sanitary service; the raising of food supplies; and the development of special industries whose products are so valuable as to be profitable notwithstanding the great distance of the Congo from the markets of the world.

Rubber, ivory, minerals and oils are the four chief industries in the Congo which will bear the expense of transportation and still yield good profits. Of these, rubber is one of the most immediately valuable. The old system of rubber collection by the natives yielded large profits, but it led to certain results which damaged the industry. The natives were willing enough to gather rubber at first, and they went into the business to the extent that more than $10,000,000 of rubber per annum was produced in King Leopold's day.

But the African natives could not eat rubber. Agents of King Leopold's government and of the commercial companies in which he was largely interested did not always appreciate the fact that they might easily kill the goose that laid the golden egg, or rather the African, whose labor produced the precious caoutchouc, when they insisted that the natives turn from agricultural pursuits to gathering wild rubber to such an extent that famine resulted in many districts.

When the rubber buyers began to bring pressure to bear on the natives to go into the forests and get rubber, the white traders did not bring food supplies into the country, but vaguely supposed that the greatest abundance of food was available locally. This was true in some districts where there was a sufficient number of unemployed natives to enable the rubber business to be carried on without interfering with food production. But in other districts this was not the case, and an American explorer chanced to see what happened to some Congo tribesmen while they were engaged in catching and smoking fish, upon which several villages were accustomed to subsist from one season to another.

One day, at the height of the fish curing season, a message came from one of King Leopold's officials, ignorant of local conditions, ordering the men engaged in this business to come immediately to his post in order to carry cargo for a rubber buying expedition into the interior. This meant the abandonment of the fish curing, since no compromise was entertained by which some of the men might be left to carry on the work. In fact, the order included a large number of women, who had to go to carry food supplies and camp equipment for the use of the men on the trip.

Tapping Landolphia Vines.

The result was that the whole population of several villages was limited to one month's supply of food, whereas, but for the interruption, a year's supply would have been secured in another month. When the porters returned after a three months' trip, they brought back cloth, sea-shells and beads with which they had been paid for their work, but there being no supply of food in the country, these articles were useless, except by making a long journey to a distant region where they might barter them for food.

Such a practice caused many of the revolts which led to wars and suffering, caused the decline of the population, made very much less labor available for the rubber industry, and caused many of the white men to be cordially hated. A more intelligent policy, without necessitating the expenditure of any more capital would have avoided this, and have increased the output of the rubber.

Rubber gathering in the Congo was both fascinating and exciting to the natives, and not by any means unpopular if properly managed, as in the earlier days of the African rubber industry. The fascinating part of the business consisted in the incidental pleasures of the chase and of camping out. Young men from a village on the African plains would pack up their belongings, march to the heavy forests along the river courses, and seek for a place where the rubber vines grew in abundance. Sometimes such a locality would be forty or fifty miles away from their homes, and it would take two or three days to get there. Then they would first put up rough palm-thatched huts, start their camp fires, and hold a religious meeting in which the medicine men would bless the undertaking, curse all their enemies, two-footed and four-footed, and see that each man had his fetish in working order. The rubber gatherers would then scatter

through the woods on a roughly prearranged plan, generally about four to each group.

The three commonest sources of rubber in the Congo are the *Landolphia Owarienses* vine, which produces red rubber; *Landolphia Klainei*, which produces black rubber, and a tree, the *Funtumia elastica*, which also produces black rubber. Of these, the first is the most valuable and furnishes the bulk of the Congo rubber. Some of the large *Landolphia* vines grow to a

Rubber Gatherers' Camp.

thickness at the bottom of 18 inches and are 200 feet long. They clamber over the tallest trees in the forest, making big loops and festoons, and they produce a fruit as large as a man's head, the seeds of the fruit being coated with a thick, gummy substance which is sweet and eaten freely by the natives. A vine of this size is a veriable veteran of the forest, and is not often found, though in places where it is abundant, such big vines may sometimes be found to the number of fifty to the square mile. Smaller vines occur more frequently, and thirty or forty of them to the acre is a fair estimate.

When the *Landolphia* is tapped, the juice oozes out slowly in a white, milky shape, and coagulates quickly upon exposure to the air. The slow bleeding of the vine is an extremely valuable characteristic of *Landolphia*, as the rubber coagulates on the bark and does not fall on the ground, unless the cut be too large and deep. Many other rubber plants must have vessels attached to them or placed under them to catch the rapidly flowing juice, and this increases the expense of collection. With the *Landolphia*, a slit under the bark six inches long and two inches wide will allow the juice to ooze out slowly, and if the slit be made in the afternoon, by the next morning a solid chunk of rubber may be detached and pulled out of the wound.

Such big vines as that just described might produce ten pounds of rubber per year without being seriously injured. The smaller vines produce in proportion. It may be said in general that five per cent of the weight of a *Landolphia* vine is rubber, though, of course, this rule is subject to many conditions. The black rubber has to be collected in vessels or in containers made of large leaves, and coagulated by heat or the use of the acid juice of certain plants.

The quantity of rubber which one man can collect varies enormously according to locality and the conditions, but on the average a native who spends the dry season of about five months collecting rubber might be expected to return with 100 pounds, worth between $75 and $300, according to the state of the market in Europe or the United States. He would get between $15 and $60 for it from the traders in the Congo. This looks like ridiculously poor pay for the natives, but it must be remembered that, at least in the early days of the trade, the rubber gatherers spent much of their time hunting game, and regarded the rubber as pin money.

An American explorer once accompanied one of these expeditions into the forest and made the experiment of personally supervising the collection of the rubber for a week in order to form an idea of the maximum capacity of native labor and of the rubber resources of the forest, if the work were done on a thorough business basis, eliminating all other forms of occupation. He found that under this system a native in a fairly good locality might collect three pounds of rubber a day on the average. He also estimated that all the heavy expenses of transportation from the Congo to Europe, the overhead charges, and other expenses might be made with a profit of 30 per cent to the business, if the natives were paid 30 per cent of the European market value of the rubber. On this basis, at the price of $2 a pound for red rubber, the natives could be paid as high as $2 a day for their labor in the forest. Such wages, of course, were never obtained by the natives, but the excess profits were taken by the rubber company. At one time a fierce régime of competition set up in the Congo, that raised the rates of pay of the rubber gatherers to a high figure, but this was soon eliminated by the formation of large rubber trusts.

While rubber gathering on the voluntary system and stimulated by decent commercial methods was often a veritable picnic to the natives, the sort prompted by force, directly or indirectly, became the cause of great misery and suffering. For example, under King Leopold's régime, a government official might count noses in a village and give an arbitrary order to the native chief that the village must produce a certain quantity of rubber annually under penalty of heavy fines or imprisonment. The government officials rarely took the trouble to inform themselves specifically about the conditions under which specified amounts of rubber would have to be collected. They

Forest of "Landolphia" Vines.

did nothing to render the work easy, but simply issued their orders and then punished the people if the required amount of rubber was not forthcoming.

If the village endeavored to comply, it often meant that every man, woman and child over eight years old would have to move into the depths of the forest and gather rubber nearly all the year. This meant the abandonment of their fields and farms, upon which their livelihood depended; as the traders did not give them food in exchange for their rubber, and as all the

other villages were in the same situation, it meant famine in every district in which this system obtained. Besides this, the life in the forests, while pleasant enough to selected groups of vigorous young men for a certain length of time, is dangerous

RUBBER MADE INTO CAKES AFTER BOILING.

and unhealthy in the rainy season, and is unsuited to permanent residence at any time.

Peremptory orders of this sort were also resented by many of the powerful chieftains, and led to wars in which the savage soldiers would be employed against rebellious natives with all the horrors of that sort of warfare, and with many instances of actual cannibalism.

Such measures were totally unnecessary in order that white men engaged in business in the Congo might make handsome profits. The natives are able to live very cheaply because of the fertility of the soil and the tropical climate, so that only a small percentage of their time is necessary to raise food and other supplies that they need. A wise system which would set

THE CONGO RAILWAY AT CHAS

aside definitely a certain time every year for the raising of crops and always maintaining a wise balance between the labor devoted to self-support and to obtaining rubber would avoid all of the evils of the old régime, and cause the country to enjoy an immense prosperity.

For example, one might take the case of a town of 5,000 people living at the head waters of the Kassai river at Wissman falls, with which the writer is personally acquainted. This village is situated on an elevated plateau within ten miles of a forest fifteen miles wide and several hundred miles in length, rich in rubber. This village could raise food supplies enough for the whole population with the labor of one-third of the population, while another third would be available for rubber gathering in the dry season and for such general industrial purposes as might be developed under white stimulus and direction during the rainy season. The town might produce under such an arrangement at least 100 tons of rubber per year, worth $200,000. The imported cloth, steel, iron and other articles which the natives would obtain with this rubber would increase the wealth and comfort of the town, meanwhile the remaining third of the population might still be engaged in agriculture, and, under white superintendents, in building roads, constructing better houses, operating saw mills, etc.

If the entire French and Belgian Congo were organized upon some such basis as this, at least $75,000,000 worth of rubber could be produced per annum.

STANDARDIZING PLANTATION METHODS.

From the fact that there has been very little change in methods of cultivation, tapping and preparation of rubber in the last few years, "The India-Rubber Journal" thinks that plantation operations have become standardized.

Even tapping operations have become more uniform; on most estates the quarter or third section system is used, one cut per tree. Frequency of tapping still varies in different countries and districts, but is usually either once a day or on alternate days. Many of the older systems have practically disappeared; "we used to hear of the half-spiral, full spiral, half herring bone, full herring bone, V, inverted V, basal and ladder tapping." The whole tendency is now towards economical bark consumption, and one cut per tree, instead of three or more, is the usual practice. As the trees grow bigger, to a girth of 50 inches or more, two cuts per tree will probably be the fashion.

The question of the number of trees to the acre is also being settled, a maximum of 80 trees with a minimum of 40 trees per acre being the ideal striven for, instead of 100 trees or more an acre.

In the factories, acetic acid is practically the only coagulating agent used, and hundreds of estates are using the same types of machinery and methods of curing for their smoked sheets and crêpe.

ALDENS' SUCCESSORS, LIMITED, IN THE FAR EAST.

Aldens' Successors (Eastern), Limited, Penang and Singapore, as of October 1, 1919, took over the business established in 1917 by R. F. Bradford as eastern representative of Aldens' Successors, Limited, of London, and incorporated with the following board of directors: A. G. Gumpert, London; Willy Friling, Antwerp; William H. Hildreth, London; E. Stevenson, London, and R. F. Bradford, Singapore, managing director. The business will be mainly in rubber and produce and an office has been opened at No. 4 Collyer Quay, Singapore, under the direction of Mr. Bradford. The Penang office will be in charge of F. D. Thompson.

PROPERTY OF THE SOCIETE FINANCIERE DIVIDED.

A partition of property has been made between the two corporations into which the Société Financière des Caoutchoucs has split; the French group, which retains the old name, will control the two plantations in Java, the eight in Sumatra and two in the Malay peninsula, while the Belgian group, the new S. I. P. E. F. (Société de Plantations et de Finances) will keep five plantations in the Federated Malay States.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED OCTOBER 7, 1919.

NO. 1,317,831. Tire structure. J. G. Smith, assignor of ¼ each to O. N. Barnett and L. C. Banmer—all of Port Arthur, Tex.
1,317,839. Syringe. G. J. L. Vermont, Flint, Mich.
1,317,851. Syringe. F. R. Arnett, Philadelphia, Pa.
1,317,928. Combined suspender and brace. A. J. Lobar, New York City.
1,317,947. Respirator. W. Solderling, New York City.
1,317,970. Sadiron wax pad. G. E. Gaver, Baltimore, Md.
1,317,976. Butt-end inner tube. J. F. Hower, assignor to the Firestone Tire & Rubber Co.—both of Akron, O. (Renewed August 15, 1919.)
1,317,978. Stocking supporter. H. Keys, Ellensburg, Wash.
1,318,026. Tire filler. B. Tamburello, New York City.
1,318,066. Fountain brush. C. A. Garvey, Clayton, Mo.
1,318,077. Tire boot. G. A. Harmuth, Drumright, Okla.
1,318,095. Tire interliner. J. P. McDonald, Orange, Tex.
1,318,119. H. B. Wallace, St. Louis, Mo.
1,318,172. Shower-bathing apparatus. H. W. Patrick, Mansfield, O.
1,318,270. Resilient tire. W. F. Farnsworth, Washington, D. C.
1,318,274. Demountable rim for tires. B. F. Gowdey, Englewood, N. J.
1,318,295. Demountable rim for tires. J. McM. Loveless, assignor of ½ to C. C. Wilton—both of Glezen, Ind.

ISSUED OCTOBER 14, 1919.

1,318,534. Demountable rim for tires. J. L. Bredar, Rock Island, Ill.
1,318,575. Tire filler. J. L. Miller, Fort Collins, Colo.
1,318,593. Hob-nailed rubber boot or shoe. C. J. Randall, assignor to The Goodyear's Metallic Rubber Shoe Co.—both of Naugatuck, Conn.
1,318,645. Unattached vulcanized rubber sole for boots and shoes. M. H. Clark, Pelham, N. Y., assignor to Boston Rubber Shoe Co., Malden, Mass. (Continuation of application Serial No. 99,255, filed May 22, 1916, and a division of application Serial No. 107,853, filed July 6, 1916, which is a continuation of application Serial No. 878,935, filed December 24, 1914.
1,318,652. Rubberized bathing-suit holder, with patent fastening device. J. D. Farkas, New York City.
1,318,872. Surgical appliance. M. N. Hofstetter, New York City.
1,318,873. Valve cap. E. E. Holt, assignor to Holt Auto Devices Co.—both of Chicago, Ill.
1,318,876. Salvaged-edge tire fabric. K. W. Jappe, assignor to The Miller Rubber Co.—both of Akron, O.
1,318,885. Cap for fountain syringes, etc. H. P. Kraft, Brooklyn, N. Y., and M. C. Schweinert, West Hoboken, N. J.
1,318,911. Nipple for nursing bottles and holder for same. A. Pfrommer, Philadelphia, Pa.
1,318,917. Cap for inflating valves. E. E. Poston, Campbell, Calif.

ISSUED OCTOBER 21, 1919.

1,319,110. Tire construction of fabric and rubber, reinforced with spring bands. J. W. Price, assignor of ½ to H. T. Miller—both of Henryetta, Okla.
1,319,155. Dust cap for tire valve, etc. H. P. Kraft, Ridgewood, N. J.
1,319,297. Device for attaching nipples, caps, etc., on containers. W. P. Limacher, Pasadena, Calif.
1,319,337. Belt and belting with elastic core, etc. L. Heimann, assignor by mesne assignments to Live Leather Belt Co., Inc.—both of New York City.
1,319,491. Artificial foot. J. F. Rowley, Chicago, Ill.
1,319,539. Resilient tire. C. H. Tondeur, Canastota, N. Y.
1,319,549. Pneumatic tire. T. W. Willerton, Bloomingdale, Mich.
1,319,556. Writing instrument similar to fountain pen. E. O. Baker, Shanghai, China
1,319,564. Crutch and cushion tip for same. M. Bruyere, Green Bay, Wis.
1,319,593. Fountain pen. B. Laffitte, Merida, Mexico.
1,319,604. Hip brassière attachment for corsets. F. C. Morse, New York City.

REISSUE.

14,740. Attachable heel for shoes or boots. G. Schrade, New York City. (Original No. 1,298,104, dated March 25, 1919.)

ISSUED OCTOBER 28, 1919.

1,319,697. Pneumatic tire. De L. Davis, Chicago, Ill.
1,319,726. Combined pneumatic and cushion tire. H. H. Schramm, New York City.
1,319,738. Bath-shower head, etc. E. G. Watrous, Chicago, Ill.
1,319,864. Cushion or solid tire and method of manufacture. J. E. Hale, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.
1,319,865. Reinforced cushion tire. J. E. Hale, and E. F. Brunner, assignors to The Goodyear Tire & Rubber Co.—all of Akron, O.
1,319,895. Safety tread for stairs, etc. W. R. Ormes, Waltham, assignor to Universal Safety Tread Co., Boston—both of Massachusetts.
1,319,991. Tire-holding means, including rubber band. J. T. Clark, Provo, Utah.
1,320,025. Pad for bicycle pedals. T. R. Palmer, Erie, Pa.
1,320,104. Demountable rim for tires. B. Tamburello, New York City.
1,320,105. Truss with inflatable pad. E. B. Toll, Yakima, Wash.
1,320,207. Hose supporter. W. W. Colson, Jacksonville, Fla.
1,320,221. Non-pneumatic rubber ball and process of manufacture. K. Fukuda, Tokio, Japan.
1,320,286. Vaginal syringe. F. W. Stanton, Chicago, Ill.
1,320,304. Pneumatic tire. J. B. Zimdars, San Francisco, Calif.
1,320,364. Arch support. S. H. Boone, Chicago, Ill. G. T. Kimmel, administrator of said Boone, deceased.

THE DOMINION OF CANADA.

ISSUED OCTOBER 7, 1919.

193,050. Tube for pneumatic tires, having rim side reinforced with embedded fabric strips permitting longitudinal transverse and diagonal expansion. A. E. Henderson, Toronto, Ont.
193,051. Tube for pneumatic tires, having roms side reinforced with embedded fabric strips permitting transverse and longitudinal expansion. A. E. Henderson, Toronto, Ont.

ISSUED OCTOBER 14, 1919.

193,161. Suspensory bandage with adjustable elastic straps. A. R. Chisholm, New York City, U. S. A.
193,227. Spring tire. T. Salari, Bisbee, Ariz., U. S. A.

ISSUED OCTOBER 21, 1919.

193,307. Cushion for inner tire. J. W. and G. F. Burgess, coinventors—both of Kansas City, Mo., U. S. A.
193,326. Resilient tire divided into two parts, one inflatable. A. A. Crozier, London, England.
193,329. Resilient tire. H. R. Davidson, Willows, Calif., U. S. A.
193,340. Core for tires, foldable to position. R. Fukuda, Yoshida Machi, Yokohama, Japan.
193,347. Ventilator for rubber boots, etc. J. V. Hagstrom, Hadlok, Wash., U. S. A.
193,349. Solid rubber tire reinforced with metal and ebonite. H. L. Harding, Loughton, Essex, Eng.
193,353. Abdominal supporter. J. L. Holt, née J. L. Moyer, Portland, Ore., U. S. A.
193,354. Rubber boot reinforced with metal strips interposed between lining and outer coating. E. J. H. Hommert, Granite City, Ill., U. S. A.
193,365. Means for fastening together a pair of rubbers, for hanging up, etc. F. J. Nelson, Halleck, Minn., U. S. A.
193,369. Ventilator for rubber boots, etc. C. A. Patrick, Ockley, Ind., U. S. A.
193,370. Pneumatic tire. L. E. Pickett, St. Louis, Mo., U. S. A.
193,378. Rubber cushion tire. T. C. Watkins, Ingram, Pa., U. S. A.
193,400. Cushion tire. The K., F. & C. Tire & Rubber Corp., Roanoke, Va., assignee of C. L. Van Ness, Akron, O., and F. A. Krussmark, of said Roanoke—both in U. S. A.

ISSUED OCTOBER 28, 1919.

193,433. Pneumatic tire with metal rim. D. Stitely, Laughlintown, and G. W. Shavers, Friedens, coinventors—both in Pennsylvania, U. S. A.
193,434. Spring tire. J. J. Kelarek and P. Dubcak, coinventors—both of Crosby, Tex., U. S. A.
193,451. Compression inner tube for pneumatic tires. N. C. Doss, Atlanta, Ga., U. S. A.
193,463. Spring tire. H. V. Higginson, Inkerman, Ont.
193,471. Inner tube. I. B. Jefferies, Lanelly, Carmarthen, Wales.
193,475. Pneumatic tire. E. B. Killen, London, Eng.
193,477. Spring tire. F. C. Kotze, Newark, N. J., U. S. A.
193,490. Boot for pneumatic tires. J. J. Nichols, Davenport, Wash., U. S. A.
193,493. Rubber heel lift. J. H. Overton, Trenton, N. J., U. S. A.
193,540. Casing for pneumatic tires, composed of major circumferential cable in turn composed of minor cables made up of twisted strands of wire, etc. W. Leeper and H. B. Hill, assignee of ½ interest—both of Bisbee, Ariz., U. S. A.

THE UNITED KINGDOM.

ISSUED OCTOBER 1, 1919.

130,364. Self-sealing tanks for petrol, etc., composed of two sheets of rubber, etc. C. A. Cleghorn, Brackenside, Woburn Sands, Bedfordshire, and Gayner Pneumatic Co., 95 Cannon street, London.
130,441. Insulated body for holding electric lamps. H. T. Wilkinson and Wardle Engineering Co., 106 Deansgate, Manchester, Eng.
130,472. Elastic ties for connecting top and bottom surfaces of pneumatic mattress. V. Marchiars, 61 rue de Bonnel, Lyons, France.
130,618. Blow-out patch. L. P. Clark, Fanwood, N. J., U. S. A. (Not yet accepted.)
130,624. Flexible wire hose with gutta percha paper between layers, etc. P. C. Rushen, 28 Southampton Buildings, London, Eng.
130,648. Respirator with pneumatic cushion. A. R. Moody, Richmond House, Shelton, Stoke-on-Trent, Staffordshire.

ISSUED OCTOBER 8, 1919.

130,676. Respiratory apparatus. G. C. Colna, 16 Ferry Road, Barnes, London.
130,747. Baby's "comforter." F. R. Graham-Yooll, Dulham Towers, East Trinity Road, Leith, Midlothian.
130,765. Cushion tire. H. C. Babel, Buffalo, N. Y., U. S. A.
130,783. Bottle closure. F. Cieszkowski, Robyville, O., U. S. A.
130,931. Tobacco pouch with separate or attached concave piece of rubber for filling pipes. H. Cooley, 206 Broomwood Road, Clapham Common, London.
130,955. Fuel tank coverings modified by addition of sheet of rubber sponge, etc. Dunlop Rubber Co., 4 rue du Colonel Moll, Paris. (Not yet accepted.)

ISSUED OCTOBER 15, 1919.

131,120. Resilient cushion wheel. J. M. Avery, North Texas Building, Dallas, Tex., U. S. A.

ISSUED OCTOBER 22, 1919.

131,390. Respiratory apparatus for divers or aviators. R. Watanabe, 13, 2 Chome, Kobiki Cho, Kyobashi-Ku, Tokio.

Chemical Patents will be found on pages 150, 151. Machinery Patents on pages 153, 154.

131,423. Pneumatic tire cover with projecting cushions. T. Dunn, 7 Woodfield avenue, Streatham Hill, London.

131,[illegible] [illegible] boots or shoes, composed of layers of canvas and rubber, with or without rubber heel pad, etc. O. R. Williams, Raydaleside, Stanhope Road, Darlington, Durham.

ISSUED OCTOBER 29, 1919.

131,672. Rubber shank stiffener reinforced with metal, etc., for boots or shoes. J. C. Parkinson, 1 Bedford street, Chorlton-upon-Medlock, Manchester, and A. T. Coker, Abington Square, Northampton.

131,734. Straps for supporting corsets from the shoulders. A. M. Dewse, 280 City Road, Sheffield.

NEW ZEALAND.

ISSUED SEPTEMBER 18, 1919.

41,[illegible] Rubber sole with textile base. G. W. Beldam, Boston Lodge, Windmill Road, Ealing, and A. U. B. Ryall, Glamorgan House, Brentford, both in Middlesex, England.

41,978. Mouth-piece for milking-machine teat cup. L. H. Browne, 52 Park Road, Papanui, Christchurch.

42,017. Pneumatic tire. Berendonck's Syndicaat voor Banden in Deelen, 16 Valeriusplein, assignee of P. E. Van Berendonck, Hotel Mille, Colonnes—both of Amsterdam, Holland.

AUSTRALIA.

To Americans.

ISSUED SEPTEMBER 2, 1919.

8,953. Pneumatic tire valve. M. Schweinert, New Jersey, U. S. A.

[illegible] Ferrule for walking stick, crutch, etc., with rubber spring. W. M. Follner, New York City, U. S. A.

GERMANY.

PATENTS ISSUED, WITH DATES OF APPLICATION.

307,649. (October 15, 1916.) Resilient tire. Wilhelm Hees, Siegen.

308,671. (March 19, 1916.) Artificial foot of hard rubber or similar material. New York-Hamburg Gummiwaaren Co., Hamburgh.

310,944. (Maorch 24, 1917.) Rubber patch for treads, pneumatic tires and the like. Emmy Thiele, born Mühleise, Magdeburg.

311,031. (October 31, 1916.) Resilient tire. Hermann Rieseler, Hamburg.

311,049. (August 16, 1916.) Elastic tire for bicycles, motors, etc. Ernst Mattern, Berlin.

311,268. (May 22, 1918.) Tire fastener, Theodore Johann Caviez, Bremen

311,365. (November 15, 1917.) Resilient tires. George A. Krause, Munich.

311,455. (May 13, 1915.) Artificial limb, with movable joints. Johannes Wegmann, Linz am Rhein.

311,537. (November 25, 1917.) Resilient tire, Gordon Co., Dresden.

311,571. (April 6, 1917.) Pneumatic springs for vehicles. Alfred Joel et Compagnie, Zürich, Switzerland.

311,685. (March 29, 1917.) Belting, Friedrich Graf de la Rosée Garmisch-Partenkirchen.

311,725. (February 27, 1918.) Injection syringe, especially for one-armed persons. Christoph von Tiedemann, Lübeck.

311,785. (May 22, 1918.) Resilient wheel. Carl Boldt, Rostock. (Additional to patent No. 299,530.)

311,928. (February 2, 1918.) Tire fastening. Gustav Oldermann, Berlin.

312,008. (April 24, 1917.) Resilient wheel. Johann Kolozsvary, Pressburg. (Austrian Patent, April 6, 1917.)

312,080. (November 16, 1917.) Resilient tire. Albert Klafke, Düsseldorf.

312,081. (January 19, 1918.) Spring tire. Hermann Ritter, Köln-Mulheim.

312,406. (July 17, 1918.) Tire fastener. August Abermeit, Berlin.

312,576. (June 25, 1918.) Resilient wheel. Richard Müller, Köln.

313,286. (August 6, 1918.) Resilient wheel, Fabrik J. P. Grüeber, Hagen in Westphalen.

313,503. (April 20, 1918. Artificial leg with adjustable knee. Otto Bucher, Halle on Saale.

313,[illegible] (July 23, 1918.) Elastic bandage. Dr. Karl Lubowski, Berlin.

314,057. (January 31, 1918.) Elastic tube tire with stiff protecting rim. Erhard Junghans, Schramberg in Württemburg.

314,175. (July 19, 1918.) Body bandage. Klara Rockland, born Fischer, Vienna.

314,227. (July 31, 1917.) Solid tires made of rubber substitutes. Carl Jung-Reinhart, Aggsbachmarkt, Lower Austria, and Anton Drexler, Vienna.

314,278. (October 17, 1917.) Resilient tire. Magda Esch, born Ruthmann, Offenbach am Main.

314,279. (November 1, 1917.) Wheel tires for automobiles, bicycles, etc. Paul Knozz, Zerbst, Anhalt.

314,3[illegible]7. (December 11, 1917.) Resilient tire. George Schonwald, Berlin.

314,401. (February 19, 1918.) Resilient wheel tires. Ackermann and Moths, Berlin.

314,575. (June 22, 1917.) Resilient tires. Karl Weiss, Nürnberg.

314,633. (March 1, 1918.) Bandage. Alb. and E. Henkels, Langerfeld bei Barmen.

314,985. (August 9, 1908.) Artificial leg. Prothesis Gesellschaft für Künstliche Glieder, Würzburg-Grombühl. (Addition to patent No. 308,021.)

315,0[illegible]8. (December 28, 1917.) Belting fastener. Fritz Heffner, Nürnberg.

315,1[illegible] (May 2, 1918.) Knee joint for artificial leg. Heinrich Schöneberger, Kaiserslautern.

315,717. (February 24, 1914.) Resilient wheel. Carl Herbrechtsmeyer and Friedrich Engelbrecht, Bunde in Westphalen.

315,844. (May 14, 1918.) Woman's automatic, tight-fitting bandage. Richard Laesecke, Stettin. (Additional to patent No. 304.651.)

315,888. (May 18, 1918.) Working arm for those amputated above the elbow. Hans Oberreiter, Vienna.

315,889. (December 15, 1917.) Knee joint. Alfred Habermann, Münich.

315,890. (November 1, 1918.) Apparatus to allow artificial knees to bend. Kältre Hirsch, Munich.

316,367. (March 1, 1917.) Artificial arm for those amputated above the elbow. (Addition to patent No. 307,594.) Heinrich Troendle, Stuttgart.

316,332. (October 24, 1917.) Arrangement for applying the pneumatic tube and the tread at the same time to the wheel of a motor car or the like. Johann Wessel Brand, The Hague, Holland. (Dutch patent of August 22, 1917.)

316,471. (May 25, 1918.) Resilient tire. Wilhelm Lauenstein, Barnstedt.

316,472. (May 5, 1918.) Resilient tire, especially for trucks, with metal plates inserted in the rim. Alfred Pfetzner, Munich.

316,621. (December 6, 1918.) Casing for pneumatic tires. Arthur von Lüde, Breslau.

316,738. (March 14, 1918.) Tire for automobiles, trucks, etc. Hermann Fritsche, Frankfort am Main.

316,976. (February 13, 1917.) Tire. Carl Schauerte, Hermsdorf bei Berlin.

316,977. (July 1, 1917.) Tire. Carl Schauerte, Hermsdorf bei Berlin.

317,114. (June 8, 1918.) Resilient tire. Walter Diessner, Lüneburg.

317,270. (September 5, 1917.) Prothesis joint that can be regulated. Bokivoj Fink, Prague.

317,286. (April 4, 1918.) Resilient tire. Franz Schenck, Altona. Fabrik C. H. F., Müller, Hamburg.

317,297. (October 31, 1917.) Artificial leg with brake for knee joint.

THE FRENCH REPUBLIC.

PATENTS ISSUED, WITH DATES OF APPLICATION.

493,029. (June 5, 1918.) Wheel tires. W. Leeper and H. B. Hill.

493,154. (November 15, 1918.) Improvement in pneumatic tires. T. Petersen.

493,233. (November 22, 1918.) Repair patch for pneumatic tires. W. C. Wood.

493,277. (November 23, 1918.) Resilient wheel. N. B. Knight and J. K. Hughes.

493,678. (December 9, 1918.) Improvement in pneumatic and other tires. A. M. Poynter.

493,951. (December 17, 1918.) Rubber button for stocking fasteners. P. Pugniet.

494,358. (December 28, 1918.) Automatic inflator for pneumatic tires. P. Jaboulay.

494,208. (January 12, 1917.) Improvements in the manufacture of rubber articles and like materials. T. Sloper.

494,268. (December 30, 1918.) Elastic footwear. A. Carnez, 30 Rue Beague, Paris.

494,468. (January 4, 1919.) Resilient wheel for automobiles. E. Jacqmain and J. Kucharek.

494,701. (January 11, 1919.) Puncture proof pneumatic tire. M. J. Sénéchal, 25 Rue Bergère, Paris.

494,709. (January 11, 1919.) Resilient vehicle wheel. J. Duran Pinñana.

495,100. (January 25, 1919.) Tires for vehicle wheels. J. A. Prince and A. L. Gilles.

TRADE MARKS.

THE UNITED STATES.

NO. 103,392. The word LEE above a star within a circle—golf balls, etc. Harry C. Lee & Co., New York City.

109,059. The words BLUE STREAK—rubber belting. The Goodyear Tire & Rubber Co., Akron, O.

110,392. The word COOLASTIC—elastic bandages for personal wear. Everlastik, Inc., Boston, Mass.

112,419. The words EVER-RITE—rubber heels and soles. E. E. Taylor Co., Boston, Mass.

115,221. Representation of a tire bearing the words and numerals QUICK DETACHABLE 34 x 4 HOOD TIRE CO., INC., WATERTOWN, MASS., and within the tire, in white against a black background, an arrow pointing from left to right and the words EXTRA PLY and HOOD TIRES—rubber tires. Hood Tires Co., Inc., Watertown, Mass.

115,470. The word UNARCO within a double-outlined diamond—asbestos and rubber machinery packing. Union Asbestos & Rubber Co., Chicago, Ill.

116,002. The word RECORD—rubber tires. Mead Cycle Co., Chicago, Ill.

117,730. Representation of the vessel *Mayflower*—rubber soles and heels. Mayflower Rubber Works Co., Braintree, Mass.

119,455. The word NITREX—varnish for coloring and coating the surface of rubber tires. The Sterling Varnish Co., Pittsburgh, Pa.

119,605. The words SEA SAFE and the representation of an anchor—waterproof bags and purses. Theodore Hutnikow, Brooklyn, N. Y.

120,296. The word CIRCOMAT—rubber mats and mattings. United States Tire Co., New Brunswick, N. J., and New York City.

120,732. The word TITAN—rubber footwear, etc. Apsley Rubber Co., Hudson, Mass.

120,734. The word CLIMAX—rubber footwear, etc. Apsley Rubber Co., Hudson, Mass.

120,842. The word OMO—gum tissue. The Omo Manufacturing Co., Middletown, Conn.

120 843. The word OMO, having a pair of wings spreading upward from the top points of the letter M—gum tissue. The Omo Manufacturing Co., Middletown, Conn.

121,677. The words PHIL CO—rubber separators or retainers for battery plates—Philadelphia Storage Battery Co., Philadelphia, Pa.

THE DOMINION OF CANADA.

25,234. Representation of seven baby heads on a ring—rubber nipples. United Drug Co., Limited, Toronto, Ont.

25,235. Representation of a druggist's mortar and pestle attached to a bar—hot-water bottles, fountain syringes, etc. United Drug Co., Limited, Toronto, Ont.

25,278. Representation of an Indian's head within a circle—vulcanized fiber. American Vulcanized Fibre Co., Wilmington, Del., U. S. A.

25,279. The words VUL-COT—vulcanized fiber. American Vulcanized Fiber Co., Wilmington, Del., U. S. A.

25,308. The word SCULPTE—hollow and solid rubber tires, tire covers, and casings, all provided with anti-skidding rubber ribs. Société Generale des Etablissements Bergougnan, Clermont-Ferrand, Puy-de-Dôme, France.

15,300. Representation [illegible] the [illegible] M. [illegible], Spokane, Wash., U. S. A.

NEW ZEALAND.

To Americans.

14,773. The [illegible] devices. Taylor Instrument Cos., 95 Ames street, Rochester, N. Y., U. S. A.

14,785. The [illegible] including tubing other than tires, belting, hose, rings, washers, packings, springs, cushions, stoppers, sheetings, bumpers, thread, tape, mats, valve-disks, rubber heels unattached, sheet tiling, and dredging sleeves. United States Rubber Co., 1790 Broadway, New York City, U. S. A.

15,157. The words [illegible] and the representation of an [illegible] on an enlarged spiral piece of [illegible] United States Rubber Co., 1790 Broadway, New York City, U. S. A.

15,526. Representation of cross-section of tire surrounding smiling face of automobilist with goggles on forehead, all above the word LEE—tires, inner tubes, valve patches, inner cases, hose, belting, etc. Lee Tire & Rubber Co., 245 West 55th street, New York City, U. S. A.

15,654. The word STAR in white-outlined black letters against a black star—pneumatic and solid tires, tire patches, liners, and retread bands. The Star Rubber Co., 1025 Sweitzer avenue, Akron, O., U. S. A.

15,707. The word FIRESTONE—boots, shoes, overshoes, hats, coats, etc., of rubber or material containing rubber. The Firestone Tire & Rubber Co., Akron, O., U. S. A.

THE FRENCH REPUBLIC.

To Americans.

26,526. The words ADAMS' CALIFORNIA FRUIT and the representation of different kinds of fruit—chewing gum, etc. American Chicle Co., New York City, U. S. A.

26,527. The words ADAMS BLACK JACK—chewing gum, etc. American Chicle Co., New York City, U. S. A.

26,528. The words ADAMS PEPSIN—chewing gum, etc. American Chicle Co., New York City, U. S. A.

AUSTRALIA.

To Americans.

24,006. The word CAMACHINE machines for slitting, winding, cutting, and perforating flexible materials; also parts and accessories. Cameron Machine Co., 61 Poplar street, Brooklyn, N. Y., U. S. A. (W. J. Spruson, Daily Telegraph Buildings, King street, Sydney.)

24,513. Representation of a woman's head above the word OMO having a pair of wings spreading upward from the top points of the letter M—dress shields of rubber or gutta percha alone or in combination but predominating. The Omo Manufacturing Co., Middletown, Conn., U. S. A. (W. J. Spruson, Daily Telegraph Buildings, King street, Sydney.)

DESIGNS.

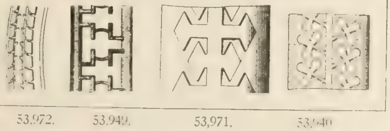
THE UNITED STATES.

No. 53,877. Rubber heel. Patented October 7, 1919. Term 14 years. Bluford W. Brockett, Cleveland Heights, O.

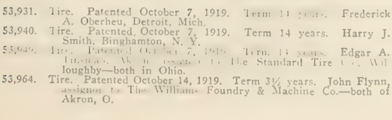
53,878. Rubber heel. Patented October 7, 1919. Term 14 years. Bluford W. Brockett, Cleveland Heights, O.

53,894. Tire. Patented October 7, 1919. Term 14 years. Walter R. Denman, Cleveland, O.

53,899. Tire. Patented October 7, 1919. Term 14 years. Howard H. Forrest, Kent, assignor to The Erie Tire & Rubber Co., Cleveland—both in Ohio.



53,894. 53,899. 53,931. 53,964.



53,972. 53,949. 53,971. 53,940.

53,931. Tire. Patented October 7, 1919. Term 14 years. Frederick A. Oberheu, Detroit, Mich.

53,940. Tire. Patented October 7, 1919. Term 14 years. Harry J. Smith, Binghamton, N. Y.

53,949. Tire. Patented October 7, 1919. Term 14 years. Edgar A. [illegible], assignor to The Standard Tire Co., Willoughby—both in Ohio.

53,964. Tire. Patented October 14, 1919. Term 3½ years. John Flynn, assignor to The Williams Foundry & Machine Co.—both of Akron, O.

53,971. Tire. Patented October 14, 1919. Term 14 years. Arthur E. Pearce, Ashtabula, O.

53,972. Tire. Patented October 14, 1919. Term 14 years. Benjamin H. Pratt, Milwaukee, Wis.

THE DOMINION OF CANADA.

4,640. Rubber mat. Patented August 21, 1919. Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ont.

4,652. Footwear. Patented September 17, 1919. Canadian Consolidated Rubber Co., Limited, Toronto, Ont.

4,653. Footwear. Patented September 17, 1919. Canadian Consolidated Rubber Co., Limited, Toronto, Ont.

4,660. Tire tread. Patented October 20, 1919. The Marathon Tire & Rubber Co., Limited, St. Catherines, Ont.

[illegible] A sign. Patented October 20, 1919. Canadian Consolidated Rubber Co., Limited, Montreal, Que.

REGULATIONS GOVERNING FOREIGN TRADE MARKS.

The following is a condensed abstract of the important features of the trade-mark laws of the leading countries of the world. Manufacturers of trade-marked articles should bear in mind that in quite a number of foreign countries ownership of a trade mark is acquired only by registration, not use. Hence, an unauthorized person may register an existing trade mark in these countries, and such registration may prevent the rightful owner from afterwards using it in those countries. The importance of registration of trade marks in foreign countries is therefore evident:

Country	Term. Years.	See Footnotes	Country	Term. Years.	See Footnotes.
Argentina	10	a c	Holland	20	c f
Australia	14	c e g	Honduras	Perpetual	a f
Austria	10	d e f	Hungary	10	a e f
Belgium	Perpetual	e f	India	-	k
Bolivia	1 or more	a h	Italy	Perpetual	a d e f
Brazil	15	d e g	Japan	20	e f
British Honduras	Perpetual	l	Luxemburg	10	f
Bulgaria	10	d g	Mexico	20	c e g
Canada—General	Perpetual	b c	New Zealand	14	c e
Canada—Specific	25	b c	Nicaragua	10	a
Ceylon	14	c e	Norway	10	a d e
Chile	10	a	Panama	10	d f
China	—	i	Paraguay	10	a
Colombia	20	f	Peru	10	a
Costa Rica	15	a	Portugal	10	a d e
Cuba	15	a d e	Rumania	15	f
Denmark	10	d e g	Russia	10	d g
D. E. Indies	20	e f	Salvador	20	c g
Ecuador	20	b c	Servia	10	a d e
Egypt	—	b j	South Africa	14	c g
Finland	10	d f	Spain	20	d e g
France	15	c e f	Sweden	10	a d e
Germany	10	a d e	Switzerland	20	d e f
Great Britain	14	c e g	Tunis	15	e f
Greece	10	d f	Turkey	15	a f
Guatemala	10	a d	Uruguay	10	c d g
			Venezuela	30 or less	a

NOTES.

(*a*)—Registration alone gives ownership. (*b*)—Ownership acquired by use without registration. (*c*)—Infringers cannot be sued until mark is registered. (*d*)—Foreigners must first register in home country. (*e*)—Under International Convention, citizen of any other Convention country has priority from home application if filed within four months. (*f*)—Registration subject to rights of prior user in such country. (*g*)—Registration is only prima-facie evidence of title to mark but becomes conclusive after expiration of a certain period. (*h*)—BOLIVIA: Registration compulsory. (*i*)—CHINA: Pending the promulgation of more satisfactory regulations, trade marks are being deposited with the Imperial Maritime Customs at Shanghai in order to secure evidence of priority of use. (*j*)—EGYPT: No statute for registering trade marks, but applicant's claim to such is filed in the Court of First Instance of the Mixed Tribunals at Cairo. (*k*)—INDIA: No special trade marks registration act exists in India, but it is customary to register a declaration of ownership of the trade mark, which registration may be adduced as evidence to prove exclusive right to the mark. (*l*)—Protection secured by advertising. (From "An Export Order." (Published by the National Association of Manufacturers, New York City.)

TRADE-MARKS AND NATIONALITY.

A new provision of the British Patent Office requires each applicant for a trade-mark to declare his nationality, or, in the case of firms, that of the individual members. This declaration may be embodied in the application, in which case the applicant must sign the application personally, or, in the case of firms, each individual member must sign and make declaration. If the application is signed by an agent, the declaration may be on the authorization to the agent or on a separate form. In the case of bodies corporate, in connection with those obviously incorporated under the laws of Great Britain, no further information will be required; in all other cases, particulars of incorporation must be inserted in the application, e. g., "a company organized under the laws of France," etc.

Review of the Crude Rubber Market.

NEW YORK.

THE CRUDE RUBBER MARKET during the past month has been largely speculative, trading has been active, and there have been large offerings which were taken up as they came, but manufacturers were not as ready to buy as they were the month before. The market has run up to 54¼ cents for smoked sheets and has been as low as 52, but the prices for the beginning and the end of the month are practically the same; they have been affected somewhat by the drop in exchange. There was some interest in January-June arrivals.

Those in a position to know are skeptical about British estimates of largely increased production of plantation rubber for 1920 and 1921 and expect rather a falling off from the figures for 1919. It is rumored that the planters in the Far East are going to take concerted action to improve their property by tapping the trees only in alternate years.

Prices for plantation and South American rubber at the beginning and toward the close of the month are shown in the following quotations:

PLANTATION *Hevea.* November 1, first latex crêpe, spot 54 cents, November-December 53½ cents, January-March 53½-54 cents, January-June 53½ cents, July-December, 1920, 53½-54 cents. November 20, spot 53 cents, futures 53½.

November 1, ribbed smoked sheets, spot 53 cents, November-December 52½ cents, January-March 53 cents, January-June 52½-53 cents, July-December, 1920, 52½-53 cents, November 20, spot 52 cents, futures 52¼ cents, July-December, 1920, 52½ cents.

NOVEMBER 1, No. 1 amber crêpe, spot 51 cents, futures 50 cents. NOVEMBER 20, spot 50½ cents.

NOVEMBER 1, clear thin brown crêpe, spot 46-47 cents, January-June 47-48 cents. NOVEMBER 20, spot 48 cents.

NOVEMBER 1, No. 1 roll brown crêpe, spot 40-41 cents, futures 39-41 cents. NOVEMBER 20, spot 47½ cents, futures 41 cents.

SOUTH AMERICAN PARAS AND CAUCHO. NOVEMBER 1, spot prices: upriver fine 52½-53½ cents, islands fine 49-50 cents, upriver coarse 34-35 cents, islands coarse 22-25 cents, Cametá coarse 22-23 cents, caucho ball 34½-35 cents. NOVEMBER 20, spot prices: upriver fine 52 cents, islands fine 48 cents, upriver coarse 34¾ cents, islands coarse 22-23 cents, Cametá coarse 24-25 cents, caucho ball 35 cents.

NEW YORK QUOTATIONS.

Following are the New York spot quotations, for one year ago, one month ago and on November 25, the current date:

	December 1, 1918. Free Rubber.	November 1, 1919.	November 25, 1919.
PLANTATION HEVEA—			
First latex crêpe	61½ @	53 @	52¼ @
Amber crêpe No. 1	57 @	49 @	51 @
Amber crêpe No. 2	56 @	48 @	50 @
Amber crêpe No. 3	55 @	47 @	49 @
Amber crêpe No. 4	54 @	46 @	47 @
Brown crêpe, thick and thin clean	53 @	44 @	47 @
Brown crêpe, thin specky	49 @	41½ @	45 @
Brown crêpe, rolled	43 @	40½ @	43½ @
Smoked sheet, ribbed, standard quality	60½ @	52 @	57¾ @
Smoked sheets, plain, standard quality	@	49 @	54 @
Unsmoked sheet, standard quality	@	47 @	52 @
Colombo scrap No. 1	@	35 @	35 @
Colombo scrap No. 2	@	34 @	34 @
EAST INDIAN—			
Assam crêpe	@	48 @	49 @
Assam onions	@	@	47 @
Penang block scrap	@	@	@
PONTIANAK—			
Banjermassin	@	11 @12	11½ @14
Palembang	@	12¾ @	13 @
Pressed block	@	22½ @	24 @27
Sarawak	@	09¾ @	11 @
SOUTH AMERICAN—			
PARAS—			
Upriver fine	64 @67	52½ @53	50 @
Upriver medium	@	50 @	@
Upriver coarse	38 @39	34½ @	34½ @35
Upriver weak, fine	52 @	41 @	40 @
Islands, fine	@	47½ @48	47½ @48
Islands, medium	@	45 @	47 @48
Islands, coarse	27 @	21½ @	22 @23
Cametá, coarse	27 @	23 @	23 @24
Madeira, fine	@	53½ @	51 @51½
Acre Bolivian, fine	@	53½ @	51 @51½
Peruvian fine	@	51 @	51 @51½
Tapajos fine	@	50 @	50 @
CAUCHO—			
Lower caucho ball	@	31 @	32 @34
Upper caucho ball	38 @39	35½ @	34 @35
MANICOBAS—			
Ceara negro heads	@	40 @	@
Ceara scrap	@	30 @	@
Maniçoba (30% guarantee)	@	37 @	@
Mangabeira thin sheet	@	40 @	@
CENTRALS—			
Corinto scrap	39 @	34 @34½	34 @34½
Esmeralda sausage	39 @	34 @34½	34 @34½
Central scrap	39 @	34 @34½	33 @34
Central scrap and strip	34 @35	30 @	32 @32½
Central wet sheet	@	24 @24½	22 @23
Guayule (20% shrinkage)	32 @	27 @	28 @
Guayule, dry	35 @	36 @	38 @
AFRICANS—			
Niger flake, prime	28 @	18 @	18 @
Benguela, extra No. 1, 28%	33 @	@	@
Benguela No. 2, 32½%	29 @	26½ @	@
Congo prime, black upper	48 @	@	37 @
Congo prime, red upper	@	@	@
Kassai black	@	@	37 @38
Rio Nunez ball	48 @	@	@
Rio Nunez sheets and strings	@	@	42 @
Conakry niggers	@	@	42 @
Massai sheets and strings	@	@	42 @
GUTTA PERCHA—			
Gutta Siak	@	23 @25	25 @
Red Macassar	@	2.60 @2.75	2.85 @
BALATA—			
Block, Ciudad, Bolivar	71 @	57 @60	60 @64
Colombia	60 @	48 @50	53 @55
Panama	58 @	40 @45	43 @45
Surinam sheet	95 @	84 @85	88 @
amber	@	87 @88	90 @

RECLAIMED RUBBER.

THE IMPROVEMENT in the reclaimed rubber market, noted in the report for the month, still continues and prices on all grades are firm with upward tendency. In some lines the mills are unable to meet the demand for stock.

Most manufacturers of mechanical rubber goods are falling behind in deliveries, particularly in the lines of heavy goods, a situation attributable in part to export demand and in part to renewal and increase of equipment in domestic manufacturing and railway equipment. Automobile tire manufacturers on all sides are planning increased manufacturing facilities. The outlook is decidedly optimistic for the reclaimers.

NEW YORK QUOTATIONS.

NOVEMBER 25, 1919.

Subject to change without notice.

Standard reclaims:			
Floating	*lb.*	.30 @	.35
Friction	*lb.*	.25 @	.35
Mechanical	*lb.*	.11 @	.16
Red	*lb.*	.20 @	.25
Shoe	*lb.*	.15 @	.15⅜
Tires, auto	*lb.*	.15 @	.16¾
truck	*lb.*	.11½ @	.12½
White	*lb.*	.22 @	.25

COMPARATIVE HIGH AND LOW SPOT RUBBER PRICES.

	October. Allocated and Free. 1919.	1918.	1917.
PLANTATIONS:			
First latex crêpe	$0.53½ @ $0.49¾	$0.62 @ $0.37	$0.65 @ $0.62½
Smoked sheet ribbed	.52½ @ .48½	.61 @ .35	.64 @ .61
PARAS:			
Upriver, fine	.55 @ .52	.66 @ .56	.66½ @ .63½
Upriver, coarse	.35 @ .33	.36 @ .30	.46 @ .42½
Islands, fine	.48½ @ .48	.59 @ .44	.55 @ .50
Islands, coarse	.23½ @ .22	.38 @ .20	.29 @ .27
Cameta	.23 @ .22	.29 @ .31	.30 @ .28

[1]Figured only to October 25.

THE MARKET FOR COMMERCIAL PAPER.

In regard to the financial situation, Albert B. Beers, broker in crude rubber and commercial paper, No. 68 William street, New York City, advises as follows:

"During November there has been a fair demand for paper, mostly from out-of-town banks, and the best rubber names have been taken at 5¾ to 6 per cent and those not so well known 6¼ to 6½ per cent.

SINGAPORE RUBBER REPORT.

GUTHRIE & CO., LIMITED, Singapore, report [October 16, 1919]:

At the usual weekly auctions held yesterday and to-day there was a strong demand for all grades which continued throughout the sales. Fine pale crêpe realized up to 96 cents (one small lot in bulk sold at 96½ cents and one lot in cases at the same figure) showing an advance on the week of 7 cents. Ribbed smoked sheet was readily taken up at up to 96 cents (two small lots in bulk fetching 96½ cents) showing an advance on last week of 6 cents.

Lower grades showed corresponding advances.

The total quantity catalogd was 940 tons of which 866 tons were offered and 674 tons sold.

The following is the course of values:

	In Singapore, per Pound.[1]	Sterling Equivalent per Pound in London.
Sheet, fine ribbed smoked	93c @ 96c	2/ 4½ @ 2/ 5⅜
Sheet, good ribbed smoked	85 @ 92½	2/ 2¼ @ 2/ 4⅜
Crêpe, fine pale	93½ @ 96	2/ 5⅛ @ 2/ 5⅞
Crêpe, good pale	86½ @ 93	2/ 3⅛ @ 2/ 5
Crêpe, fine brown	70 @ 74	1/10½ @ 1/11⅝
Crêpe, good brown	65 @ 67½	1/ 9⅛ @ 1/ 9⅞
Crêpe, dark brown	62 @ 66½	1/ 8¼ @ 1/ 9½
Crêpe, bark brown	59 @ 60	1/ 7⅝ @ 1/ 7¾

[1]Quoted in S. S. Currency—$1 = $0.567.

BATAVIA RUBBER MARKET.

HERMANS, MARSMAN & CO., Batavia, report [August 15-September 18, 1919]:

The market opened rather quiet and prices advanced until 1.21 guilders [48.4 cents] for the 100 per cent first crêpe and 1.19 guilders [47.6 cents] for the smoked sheets. Suddenly a very strong demand came up which caused a heavy advance of prices for all grades. The highest price paid for the 100 per cent first crêpe was about 1.45 guilders [58 cents], with one cent lower for the smoked sheets. These prices could only maintain for some days and they soon increased again. The market closed with the following quotations:

	In Batavia Per ½-kilo.[1] Guilders.	Equivalent Per ½-kilo in U. S. Currency.
Fine pale crêpe	1.35	$0.54
First pale crêpe	1.33	.532
First pale crêpe, basis 75 per cent	1.25	.50
Prime smoked sheets	1.31	.524
Prime smoked sheets, basis 75 per cent	1.23	.496

[1] Quoted per ½-kilo (1.1 pounds) in Dutch Indian guilders ($0.40).

PLANTATION RUBBER EXPORTS FROM JAVA.*

	August.		Eight Months Ended August 31.	
	1918.	1919.	1918.	1919.
To Holland ......kilos	......	567,000	......	981,000
England	......	177,000	1,659,000	4,781,000
France	......	......	......	176,000
United States	213,000	1,013,000	4,454,000	11,578,000
Singapore	667,000	494,000	5,874,000	3,580,000
Japan	22,000	......	656,000	179,000
Australia	303,000	76,000	354,000	245,000
Other countries	83,000	......	393,000	33,000
Totals	1,287,000	2,327,000	13,390,000	21,553,000
Ports of origin:				
Tandjong Priok	969,000	1,584,000	7,182,000	11,700,000
Cheribon	......	10,000	......	10,000
Semarang	9,000	28,000	124,000	345,000
Soerabaya	309,000	682,000	6,085,000	8,751,000
Probolinggo	......	24,000	......	24,000
Tjilatjap	......	......	......	149,000
Totals	1,287,000	2,328,000	13,391,000	20,979,000

* Not verified.

FEDERATED MALAY STATES RUBBER EXPORTS.

An official report from Kuala Lumpur states that the September exports of rubber from the Federated Malay States amounted to 9,841 tons compared with 10,626 tons in August and 6,588 tons in the corresponding month last year. For nine months of the present year the exports amounted to 79,824 tons against 58,142 tons in 1918 and 58,848 tons in 1917. Appended are the comparative statistics.

	1917.	1918.	1919.
January ......tons	5,995	7,588	7,163
February	7,250	6,820	10,809
March	7,088	7,709	10,679
April	5,955	7,428	7,664
May	7,179	5,851	7,308
June	6,009	5,161	7,094
July	5,798	5,706	8,640
August	6,487	5,291	10,626
September	7,087	6,588	9,841
Totals	58,848	58,142	79,824

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official report from Singapore states that the export of plantation rubber from Straits Settlements ports in the month of September amounted to 10,476 tons (of which 2,140 tons were transhipments), compared with 8,933 tons in August and 6,209 tons in the corresponding month last year. The total exports for nine months of the present year amounted to 109,952 tons, compared with 51,616 tons in 1918 and 56,332 tons for the corresponding period in 1917. Appended are the comparative statistics:

	1917.	1918.	1919.
January ......tons	3,562	4,302	14,404
February	6,495	2,334	15,661
March	8,299	8,858	20,908
April	6,103	6,584	10,848
May	6,282	13,587	15,845
June	8,775	6,515	5,059
July	7,351	1,978	7,818
August	3,786	1,249	8,933
September	5,679	6,209	10,476
Totals	56,332	51,616	109,952

RUBBER IMPORTS AND EXPORTS FOR CEYLON.

IMPORTS.

	January 1 to October 6.	
	1918.	1919.
Crude rubber:		
From Straits Settlements ......pounds	1,996,633	2,088,102
India	2,479,076	1,099,924
Burma and other countries	3,107	......
Totals	4,478,816	3,187,526

EXPORTS.

	1918.	1919.
Crude rubber:		
To United Kingdom ......pounds	15,260,973	20,690,277
Belgium	......	29,120
France	471,735	383,400
[1]Victoria	513,119	98,755
[1]New South Wales	319,491	154,212
United States	13,588,545	44,539,523
Canada and Newfoundland	5,386,995	668,294
Africa	2,294	......
India	2,459	2,313
Straits Settlements	......	454
Japan	206,058	213,506
Totals	35,751,669	66,779,854

[1]These figures include cargoes for transshipment to New Zealand, other ports of Australia, and dependencies

(Compiled by the Ceylon Chamber of Commerce.)

ANTWERP RUBBER ARRIVALS.

October 30. By the steamer *Anversville* from the Congo.

Bungé & Co. (Comptoir Commercial Congolais) ......kilos	11,640
Bungé & Co. (Belgika)	2,500
Bungé & Co. (Grands Lacs)	9,300
Bungé & Co. (Campagnie du Kassai)	28,000
Bungé & Co. (Forminière)	6,100
Bungé & Co.	39,000
Société Coloniale Anversoise (Chemin de Fer du Haut Congo)	10,240
Others	62,600
Total ......kilos	169,380

EXPORTS OF INDIA RUBBER FROM MANAOS DURING THE MONTH OF SEPTEMBER, 1919.

	New York.					Europe.					
Exporters.	Fine.	Medium.	Coarse.	Caucho.	Totals.	Fine.	Medium.	Coarse.	Caucho.	Totals.	Grand Totals.
Tancredo, Porto & Co......kilos	91,055	12,604	11,796	64,545	180,000	70,000	......	......	......	70,000	250,000
J. A. Mendes & Co	78,355	4,637	10,438	144,160	237,590	......	......	......	......	......	237,590
General Rubber Co. of Brazil	137,427	11,399	17,128	41,046	207,000	......	......	......	......	......	207,000
Stowell & Co	121,000	5,523	11,422	9,470	147,415	......	......	2,573	......	2,573	149,988
Ohliger & Co	31,875	10,540	2,819	50,133	95,367	......	......	......	......	......	95,367
Semper & Co	10,240	......	......	......	10,240	......	......	......	......	......	10,240
Adelbert H. Alden, Limited	......	......	......	......	......	3,570	......	......	......	3,570	3,570
Totals	469,952	44,703	53,603	309,354	877,612	73,570	......	2,573	......	76,143	953,755
From Iquitos	40,684	39,802	2,705	5,550	88,741	26,676	11,969	7,032	11,621	57,298	146,039
Totals	510,636	84,505	56,308	314,904	966,353	100,246	11,969	9,605	11,621	133,441	1,099,794

(Compiled by Stowell & Co., Manáos, Brazil.)

CRUDE RUBBER ARRIVALS AT ATLANTIC AND PACIFIC PORTS AS STATED BY SHIPS' MANIFESTS.

PARAS AND CAUCHO AT NEW YORK.

	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Totals.
[illegible]						
[illegible]	[illegible]		[illegible]			[illegible]
†H. A. Astlett & Co.	[illegible]	[illegible]	36,000	401,100	......	724,500
[illegible]						[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]			6,854	4,113	......	10,967
[illegible]	[illegible]	28	......	......	......	10,296
[illegible]	[illegible]	2,230	206,622	209,658	......	419,658
[illegible]				[illegible]		[illegible]
[illegible]	[illegible]	157	......	....	....	136,182
[illegible]	[illegible]	[illegible]		[illegible]		45,430
General Rubber Co....						14,000
V[illegible]						2,033,973
NOVEMBER 3. By the S. S. *Newton*, from Pará.						
†H. A. [illegible]	[illegible]		[illegible]			[illegible]
†[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
Gaston, Williams & W[illegible]						[illegible]
G. A[illegible], Inc.						[illegible]
†P[illegible]	[illegible]	[illegible]				[illegible]
Meyer & B[illegible]						[illegible]
Various	......	......	......	......	......	4,928,815
NOVEMBER 8. By the S. S. *St. Michael*, from Pará, Manáos, Iquitos and Ceara						
†H. A. Aslett & Co.	123,000	......	56,500	156,500	......	330,000
†Paul Bert[illegible]	84,758	3,206	43,893	84,656	......	216,513
†Poel & Kelly	235,190	10,793	8,953	1,401	2,644	258,981
General Rubber Co.	377	28	72	......	......	1,882,779
Ultramares Corp.	236	37	26	......	......	104,526
†Meyer & Brown, Inc.	83,100§	......	4,500	20,900	......	108,500
Gaston, Williams & Wigmore	270	......	......	95	......	157,797
G. Amsinck & Co., Inc.	....	......	12			3,340
Aldens' Successors, Inc.		3,331	2,834	464	12,777	19,406
F. R. Henderson & Co.	27	2	2	......	......	10,480
Winter, Ross & Co.	22	1	9	......	1	10,113
Cowdrey & Co.	19	......	......	......	......	6,626
W. R. Grace & Co.	......	24	4	......	......	12,607
Rubber Association of America, Inc.	10	16	6	......	5	17,415
¶Various	1,381	330	632	256	475	1,109,288
‡Various	135	......	......	......	......	38,396

†Pounds. ‡From Ceara, bales and cases. ¶Including 38,035 pounds transhipped from Itacoatiara. §Pounds, including medium.

PLANTATIONS.

(Figured 180 pounds net to the bale or case.)

	Shipment from.	Shipped to.	Pounds.	Totals.
OCTOBER 20. By the S. S. *Manhattan*, at New York.				
The Goodyear Tire & Rubber Co.	London	Akron, O.	49,920	
Rubber Trading Co.	London	New York	44,800	
H. F. Winter & Co.	London	New York	28,260	122,980
OCTOBER 20. By the S. S. *Osteric*, at New York.				
F. H. Henderson & Co.	Glasgow	New York	659,838	
Rubber Trading Co.	Glasgow	New York	22,400	
Chas. T. Wilson & Co., Inc.	Glasgow	New York	22,400	
L. Littlejohn & Co., Inc.	Glasgow	New York	224,000	
Meyer & Brown, Inc.	Glasgow	New York	227,400	
Poel & Kelly	Glasgow	New York	183,040	
The Goodyear Tire & Rubber Co.	Glasgow	Akron, O.	111,600	
C. C. Trevanion & Co.	Glasgow	New York	12,600	
Various	Glasgow	New York	50,400	1,513,678
OCTOBER 20. By the S. S. *Empress of Asia*, at Vancouver.				
The Goodyear Tire & Rubber Co.	Singapore	Akron, O.	245,700	
Edward Boustead & Co.	Penang	Akron, O.	144,000	
F. R. Henderson & Co.	Singapore	Seattle	70,920	
F. R. Henderson & Co.	Singapore	New York	37,080	
Adolph Hirsch & Co.	Singapore	New York	44,890	
Meyer & Brown, Inc.	Singapore	Vancouver	33,600	576,190
OCTOBER 21. By the S. S. *Rotterdam*, at New York.				
Aldens' Successors, Inc.	Rotterdam	New York	44,800	
Various	Rotterdam	New York	22,160	66,960
OCTOBER 23. By the S. S. *Francisco*, at New York.				
Various	Hull	New York	6,270	6,270
OCTOBER 23. By the S. S. *Celtic*, at New York.				
Various	Liverpool	New York	25,920	25,920
OCTOBER 23. By the S. S. *Kerman*, at New York.				
The Goodyear Tire & Rubber Co.	Colombo	Akron, O.	344,095	
Meyer & Brown, Inc.	Colombo	New York	280,000	
L. Littlejohn & Co., Inc.	Colombo	New York	[illegible]	
C. C. Trevanion & Co.	[illegible]	Seattle	[illegible]	
Chas. T. Wilson Co., Inc.	Colombo	New York	91,840	
Poel & Kelly	[illegible]	[illegible]	85,530	
Winter, Ross & Co.	Colombo	[illegible]	[illegible]	
Thornett & Fehr	Colombo	New York	44,200	1,764,045
OCTOBER 24. By the S. S. *Verbania*, at New York.				
Aldens' Successors, Inc.	London	[illegible]	[illegible]	
Poel & Kelly	London	New York	546,011	
Winter, Ross & Co.	London	New York	1,267,020	
Thornett & Fehr	London	New York	367,740	
The Goodyear Tire & Rubber Co.	London	Akron, O.	166,140	
East Asiatic Co., Inc.	London	New York	[illegible]	
Curry, McPhillips & Co.	London	New York	1,131,660	
L. Littlejohn & Co., Inc.	London	New York	[illegible]	5,853,434
OCTOBER 25. By the S. S. *Invincible*, at New York.				
L. Littlejohn & Co., Inc.	London	New York	175,620	175,620
OCTOBER 27. By the S. S. *Prometheus*, at New York.				
F. R. Henderson & Co.	Singapore	New York	890,820	
Chas. T. Wilson Co. Inc.	Singapore	New York	201,600	
William H. Stiles & Co.	Singapore	New York	145,600	
Pell & Dumont, Inc.	Singapore	New York	100,800	
[illegible] Trading Co. of America	Singapore	New York	71,820	
Aldens' Successors, Inc.	Singapore	New York	335,835	
Firestone Tire & Rubber Co.	Singapore	New York	[illegible]	
Adolph Hirsch & Co., Inc.	Singapore	New York	44,804	
Raw Products Co.	Singapore	New York	30,240	
J. T. Johnstone & Co., Inc.	Singapore	New York	[illegible]	
L. Littlejohn & Co., Inc.	Singapore	New York	1,258,000	
Fred Stern & Co.	Singapore	New York	459,000	
Edward Maurer Co., Inc.	Singapore	New York	277,280	
Poel & Kelly	Singapore	New York	197,500	
Meyer & Brown, Inc.	Singapore	New York	246,400	
Thos. A. Desmond & Co.	Singapore	New York	235,260	
East Asiatic Co.	Singapore	New York	226,000	
Gaston, Williams & Wigmore	Singapore	New York	196,920	
Edward Boustead & Co.	Singapore	New York	120,420	
Jaeger & Co., of London	Singapore	New York	114,540	
Mexican Crude Rubber Co.	Singapore	New York	108,000	
A. C. Harper	Singapore	New York	72,000	
Suzuki & Co.	Singapore	New York	49,500	
Rogers-Pyatt Shellac Co.	Singapore	New York	39,420	
Federal Export Corp.	Singapore	New York	18,360	
W. R. Grace & Co.	Singapore	New York	18,360	
Boston Insulated Wire & Cable Co.	Singapore	Dorchester	3,780	
Stanley, Jordan & Co.	Singapore	New York	360	
Various	Singapore	New York	702,705	6,360,824
OCTOBER 27. By the S. S. *Saugerties*, at New York.				
J. T. Johnstone & Co., Inc.	Penang	New York	325,000	
F. R. Henderson & Co.	Penang	New York	250,020	
Chas. T. Wilson Co., Inc.	Penang	New York	168,000	
General Rubber Co.	Penang	New York	117,000	
Hood Rubber Co.	Penang	Watertown	90,000	
William H. Stiles & Co.	Penang	New York	67,200	
Rubber Trading Co.	Penang	New York	54,000	
L. Littlejohn & Co.	Penang	New York	806,000	
Winter, Ross & Co.	Penang	New York	397,980	
Vernon Metal & Produce Co.	Penang	New York	254,520	
Edward Maurer Co., Inc.	Penang	New York	192,600	
Fred Stern & Co.	Penang	New York	179,200	
East Asiatic Co., Inc.	Penang	New York	173,120	
Rubber Importers' & Dealers' Co., Inc.	Penang	New York	86,040	
Poel & Kelly	Penang	New York	39,960	
The Goodyear Tire & Rubber Co.	Penang	Akron, O.	36,540	
W. R. Grace & Co.	Penang	New York	27,000	
Various	Penang	New York	558,720	3,823,900
OCTOBER 27. By the S. S. *Cedric*, at New York.				
Poel & Kelly	Liverpool	New York	34,641	
L. Littlejohn & Co., Inc.	Liverpool	New York	22,400	
Various	Liverpool	New York	7,740	64,781
OCTOBER 28. By the S. S. *Orduna*, at New York.				
Rubber Importers' & Dealers' Co., Inc.	Liverpool	New York	154,440	
L. Littlejohn & Co., Inc.	Liverpool	New York	141,107	
The B. F. Goodrich Co.	Liverpool	Akron, O.	92,520	
Thos. A. Desmond & Co.	Liverpool	New York	61,200	
Edward Maurer & Co., Inc.	Liverpool	New York	33,120	
Poel & Kelly	Liverpool	New York	19,800	
Meyer & Brown, Inc.	Liverpool	New York	11,300	513,487
OCTOBER 29. By the S. S. *Diablo*, at San Francisco.				
J. T. Johnstone & Co., Inc.	Singapore	San Francisco	74,500	
Fred Stern & Co.	Singapore	San Francisco	33,600	108,100
OCTOBER 29. By the S. S. *Rotti*, at New York.				
Winter, Ross & Co.	T'jong Priok	New York	169,920	
Peninsular Trading Agency	T'jong Priok	New York	157,320	
L. Littlejohn & Co., Inc.	Batavia	New York	78,400	
Poel & Kelly	Batavia	New York	57,263	
General Rubber Co.	T'jong Priok	New York	45,000	
Catz American Co.	Batavia	New York	180	
Various	Batavia	New York	41,660	549,743
NOVEMBER 3. By the S. S. *Henry Clay*, at New York.				
Thornett & Fehr	London	New York	133,560	
Rubber Trading Co.	London	New York	20,700	
L. Littlejohn & Co., Inc.	London	New York	2,196	
Various	London	New York	110,160	266,616
NOVEMBER 3. By the S. S. *Caronia*, at New York.				
L. Littlejohn Co., Inc.	Liverpool	New York	109,560	
Various	Liverpool	New York	46,140	155,700
NOVEMBER 5. By the S. S. *Nieuw Amsterdam*.				
Meyer & Brown, Inc.	Rotterdam	New York	220,800	
Various	Rotterdam	New York	245,530	466,330
N[illegible] By the S. S. [illegible], at New York.				
[illegible] T[illegible] & Rubber Co.	S'thampton	Akron, O.	161,280	161,280

[1]One case shortshipped on S. S. *Karimoen*.

	Shipment from.	Shipped to.	Pounds.	Totals.
November 6. By the S. S. [illegible], at New York.				
L. Littlejohn & Co., Inc.	Marseilles	New York	11,200	11,200
No date. By the S. S. *Bengkalis*, at San Francisco.				
J. T. Johnstone & Co., Inc.	Batavia	San Fran.	[illegible]	70,500
November 6. By the S. S. *Irion*, at Seattle, Washington.				
The B. F. Goodrich Co.	Singapore	Akron, O.	767,880	
The B. F. Goodrich Co.	Penang	Akron, O.	229,860	
Raw Products Co.	Singapore	New York	187,200	
Firestone Tire & Rubber Co.	Penang	Akron, O.	137,340	
J. T. Johnstone & Co.	Singapore	San Fran.	75,650	
[2]General Rubber Co.	Singapore	New York	23,940	
William H. Stiles & Co.	Singapore	New York	19,340	
L. Littlejohn & Co., Inc.	Singapore	New York	860,040	
Fred Stern & Co.	Singapore	New York	560,000	
Rubber Importers' & Dealers' Co., Inc.	Singapore	New York	379,620	
Hadden & Co.	Singapore	New York	213,660	
Thomas A. Desmond & Co.	Singapore	New York	189,000	
Independent Rubber Co., Limited	Singapore	Merriton, Ont.	38,800	
East Asiatic Co.	Singapore	New York	27,000	
The Goodyear Tire & Rubber Goods Co., Ltd.	Singapore	Toronto	10,080	3,719,410

[2]Shortshipped in S. S. *Tyndareus*.

	Shipment from.	Shipped to.	Pounds.	Totals.
November 7. By the S. S. *Andoca Luckenbach*, at New York.				
Meyer & Brown, Inc.	Rotterdam	New York	44,100	44,100
November 7. By the S. S. *Mississippi*, at New York.				
L. Littlejohn & Co., Inc.	London	New York	200,822	
Rubber Trading Co.	London	New York	61,920	262,742
November 10. By the S. S. *Navarino*, at New York.				
The B. F. Goodrich Co.	Glasgow	Akron, O.	1,003,140	
Poel & Kelly	Glasgow	New York	71,227	
L. Littlejohn & Co., Inc.	Glasgow	New York	69,400	
Various	Glasgow	New York	2,237,200	3,380,967
November 10. By the S. S. *Aledo*, at New York.				
Curry, McPhillips & Co.	Antwerp	New York	13,320	13,320
November 10. By the S. S. *Carmania*, at New York.				
Poel & Kelly	Liverpool	New York	171,241	
The B. F. Goodrich Co.	Liverpool	New York	103,500	
General Rubber Co.	Liverpool	New York	27,720	
Rubber Trading Co.	Liverpool	New York	19,080	
Various	Liverpool	New York	32,940	354,481
November 10. By the S. S. *Baltic*, at New York.				
The Goodyear Tire & Rubber Co.	Liverpool	Akron, O.	55,260	
Thos. A. Desmond & Co.	Liverpool	New York	35,640	90,900
November 10. By the S. S. *Aledo*, at New York.				
Curry, McPhillips & Co.	Antwerp	New York	13,320	13,320
November 11. By the S. S. *Santa Cruz*, at San Francisco.				
Fred Stern & Co.	Singapore	San Fran.	145,000	
J. T. Johnstone & Co., Inc.	Singapore	San Fran.	73,920	218,920
November 11. By the S. S. *Eglantier*, at New York.				
Various	Antwerp	New York	46,620	46,620
November 11. By the S. S. *Luxpalite*, at New York.				
Poel & Kelly	Marseilles	New York	44,627	
Various	Marseilles	New York	131,413	176,040
November 12. By the S. S. *Siberian Prince*, at New York.				
Various	Havre	New York	4,500	4,500
November 14. By the S. S. *Vasconia*, at New York.				
General Rubber Co.	London	New York	616,860	
T. D. Downing & Co.	London	New York	155,880	
Poel & Kelly	London	New York	147,960	
Various	London	New York	845,640	1,763,340
November 14. By the S. S. *Romeo*, at New York.				
L. Littlejohn & Co., Inc.	Colombo	New York	134,400	
Volkart Bros.	Colombo	New York	130,680	
Meyer & Brown, Inc.	Colombo	New York	112,000	
General Rubber Co.	Colombo	New York	90,000	
Chas. T. Wilson Co., Inc.	Colombo	New York	20,160	
The Goodyear Tire & Rubber Co.	Colombo	Akron, O.	19,840	
Various	Colombo	New York	6,280	513,360
November 15. By the S. S. *Tumeric*, at New York.				
The Goodyear Tire & Rubber Co.	Colombo	Akron, O.	45,720	
C. C. Trevanion & Co.	Colombo	New York	45,360	
Edward Maurer Co., Inc.	Colombo	New York	360	91,440
November 15. By the S. S. *Bawean*, at New York.				
General Rubber Co.	T'jong Priok	New York	126,000	
J. T. Johnstone & Co., Inc.	Soerabaya	New York	105,560	
J. T. Johnstone & Co., Inc.	T'jong Priok	New York	33,120	
T. R. Henderson	Batavia	New York	59,580	
Aldens' Successors, Inc.	Soerabaya	New York	21,984	
Pablo Homs	Batavia	New York	869,060	
Pablo Homs	T'jong Priok	New York	18,360	
Poel & Kelly	Batavia	New York	224,000	
L. Littlejohn & Co., Inc.	Singapore	New York	122,622	
The Goodyear Tire & Rubber Co.	Batavia	Akron, O.	101,860	
The Goodyear Tire & Rubber Co.	T'jong Priok	Akron, O.	15,480	
Joosten & Janssen	T'jong Priok	New York	91,980	
L. Sutro & Co.	T'jong Priok	New York	64,700	
L. Sutro & Co.	Batavia	New York	28,980	
Meyer & Brown, Inc.	Batavia	New York	40,300	
Vernon Metal & Produce Co.	T'jong Priok	New York	22,060	
G. Amsinck & Co., Inc.	T'jong Priok	New York	18,840	
Various	Batavia	New York	283,014	
Various	T'jong Priok	New York	110,160	
Various	Penang	New York	13,680	2,371,340
November 17. By the S. S. *Tumeric*, at New York.				
T. R. Henderson & Co.	Colombo	New York	45,000	
Chas. T. Wilson & Co., Inc.	Colombo	New York	42,840	
L. Littlejohn & Co., Inc.	Colombo	New York	448,000	
The Goodyear Tire & Rubber Co.	Colombo	Akron, O.	190,800	
C. C. Trevanion & Co.	Colombo	New York	176,400	
Meyer & Brown, Inc.	Colombo	New York	100,000	
Poel & Kelly	Colombo	New York	79,920	1,082,960
November 18. By the S. S. *Empress of Russia*, via Hongkong, at Vancouver.				
General Rubber Co.	Singapore	New York	534,960	
Edward Boustead & Co.	Penang	New York	144,000	
The Goodyear Tire & Rubber Co.	Singapore	Akron, O.	127,980	
Thornett & Fehr	Batavia	New York	19,800	
L. Sutro & Co.	Batavia	New York	14,940	841,680
November 18. By the S. S. *Eurypylus*, at New York.				
F. R. Henderson & Co.	Singapore	New York	1,662,560	
J. T. Johnstone & Co., Inc.	Medan	New York	610,000	
Chas. T. Wilson Co., Inc.	Singapore	New York	241,380	
Pacific Trading Corp. of America	Singapore	New York	201,600	
William H. Stiles & Co.	Singapore	New York	190,400	
The Fisk Rubber Co.	Singapore	Chicopee Falls	90,000	
Rubber Trading Co.	Singapore	New York	72,000	
Aldens' Successors, Inc.	Singapore	New York	47,000	
Hood Rubber Co.	Singapore	Watertown	44,800	
L. Littlejohn & Co., Inc.	Singapore	New York	1,498,625	
The Goodyear Tire & Rubber Co.	Singapore	Akron, O.	1,107,720	
Rubber Importers' & Dealers' Co., Inc.	Singapore	New York	790,920	
Fred Stern & Co.	Singapore	New York	257,000	
Meyer & Brown, Inc.	Singapore	New York	224,000	
Robertson, Cole & Co.	Singapore	New York	188,280	
Edward Maurer Co., Inc.	Singapore	New York	141,480	
Mitsui & Co., Limited	Singapore	New York	100,260	
Gaston, Williams & Wigmore	Singapore	New York	89,280	
Stephano Berizzi & Co.	Singapore	New York	40,320	
Rubber Association of America	Singapore	New York	36,000	
East Asiatic Co.	Singapore	New York	32,040	
Joosten & Janssen	Singapore	New York	27,000	
W. R. Grace & Co.	Singapore	New York	27,000	
Mexican Crude Rubber Co.	Singapore	Detroit	23,440	
Federal Export Corp.	Singapore	New York	18,300	
Jaeger & Co., Limited	Singapore	New York	10,080	
Poel & Kelly	Singapore	New York	5,580	
Winter, Ross & Co.	Singapore	New York	540	
Various	Singapore	New York	1,636,380	9,414,645
November 18. By the S. S. *Waaldyk*, at New York.				
General Rubber Co.	Batavia	New York	875,520	
The Fisk Rubber Co.	Batavia	Chicopee Falls	148,500	
J. T. Johnstone & Co., Inc.	Batavia	New York	103,488	
Manhattan Rubber Mfg. Co., Inc.	Batavia	New York	56,160	
Pennsylvania Rubber Co.	Batavia	Jeanette, Pa.	18,720	
L. Littlejohn & Co., Inc.	Soerabaya	New York	224,000	
The Goodyear Tire & Rubber Co.	Batavia	Akron, O.	175,860	
The Goodyear Tire & Rubber Co.	Soerabaya	Akron, O.	125,280	
Rutger Bleecker	Soerabaya	New York	64,440	
Rutger Bleecker	Batavia	New York	54,720	
United Malaysian Rubber Co., Ltd.	Soerabaya	New York	27,400	
Bolle-Watson Co., Inc.	Soerabaya	New York	22,500	
Java-Holland Am. Trading Co.	Soerabaya	New York	15,120	
Rubber Association of America	Soerabaya	New York	9,720	
Various	Batavia	New York	142,080	2,063,508
November 19. By the S. S. *Protesilaus*, at Seattle.				
Fred Stern & Co.	Singapore	Seattle	166,000	166,000
November 20. By the S. S. *Minnekahda*, at New York.				
Rubber Trading Co.	London	New York	29,880	
L. Littlejohn & Co., Inc.	London	New York	104,620	134,500
November 20. By the S. S. *City of Manila*, at New York.				
Meyer & Brown, Inc.	Colombo	New York	224,000	
Poel & Kelly	Colombo	New York	95,340	
Pacific Trading Corp. of America	Colombo	New York	94,680	
Aldens' Successors, Inc.	Colombo	New York	33,600	447,620

AFRICANS.

	Shipment from.	Shipped to.	Pounds.	Totals.
OCTOBER 20. By the S. S. [illegible], at New York.				
Rubber Importers' & Dealers Co., Inc.	Marseilles	New York	15,295	
Various	Marseilles	New York	5,520	20,815
OCTOBER [illegible]. By the S. S. [illegible], at New York.				
Various	Bordeaux	New York	320,350	320,350

CENTRALS.

NOVEMBER 6. By the S. S. *Cheropee*, at New York.				
Andean Trading Co.	Cartagena	New York	20,000	20,000
NOVEMBER 10. By the S. S. *Gen. G. W. Goethals*, at New York.				
G. Amsinck & Co., Inc.	Cristobal	New York	11,700	
De Lima, Correa & Cortissoz, Inc.	Cristobal	New York	10,000	
J. S. Sembrada & Co.	Cristobal	New York	10,000	
H. A. [illegible] & Co.	Cristobal	New York	5,000	
Neuss, Hesslein & Co.	Cristobal	New York	6,000	
A. H. Capen's Sons, Inc.	Cristobal	New York	3,600	
I. [illegible]	Cristobal	New York	[illegible]	53,300
NOVEMBER 10. By the S. S. *Vindal*, at New York.				
American Trading Co.	Cartagena	New York	9,500	9,500

MANICOBAS.

OCTOBER 21. By the S. S. *Osage*, at New York.				
Adolph Hirsch & Co., Inc.	Bahia	New York	21,958	21,958

PONTIANAK.

OCTOBER 27. By the S. S. *Prometheus*, at New York.				
United Malaysian Rubber Co., Ltd.	Singapore	New York	670,655	
Meyer & Brown, Inc.	Singapore	New York	130,500	
Kidder, Peabody & Co.	Singapore	New York	108,300	
L. Littlejohn & Co., Inc.	Singapore	New York	60,000	
East Asiatic Co., Inc.	Singapore	New York	17,700	
Various	Singapore	New York	105,000	1,092,155
NOVEMBER 6. By the S. S *Ixion*, at Seattle.				
Hadden & Co.	Singapore	New York	68,760	
Stephano Berizzi & Co.	Singapore	New York	48,000	116,760
NOVEMBER 15. By the S. S. *Bawean*, at New York.				
United Malaysian Rubber Co., Ltd.	B'j'rmassin	New York	25,770	25,770
NOVEMBER 18. By the S. S. *Eurypylus*, at New York.				
United Malaysian Rubber Co., Ltd.	Singapore	New York	508,913	
L. Littlejohn & Co., Inc.	Singapore	New York	393,000	
Stephano Berizzi & Co.	Singapore	New York	72,000	
Various	Singapore	New York	192,900	1,166,813
NOVEMBER 18. By the S. S. *Waaldyk*, at New York.				
E. Everett Carleton & Co.	Batavia	New York	41,400	41,400

BALATA.

OCTOBER 21. By the S. S. *Maraval*, at New York.				
[3] Southern Sales Corp.	Trinidad	New York	24,390	
G. Amsinck & Co., Inc.	Trinidad	New York	13,950	
Various	Trinidad	New York	1,350	39,690

[3] Including 11,040 pounds block balata.

OCTOBER 23. By the *Prins der Nederlanden*, at New York.				
Arkell & Douglass, Inc.	Cape Haitien	New York	6,393	
Middleton & Co.	Cape Haitien	New York	771	7,164
OCTOBER 24. By the S. S. *Panama*, at New York.				
G. Amsinck & Co., Inc.	Cristobal	New York	25,075	
South & Central American Commercial Co.	Cristobal	New York	8,075	
Various	Cristobal	New York	4,675	37,825
OCTOBER 27. By the S. S. *Venus*, at New York.				
Middleton & Co.	Caracas	New York	42,845	
William Schall & Co.	Caracas	New York	9,000	51,845
NOVEMBER 6. By the S. S. *Cheropee*, at New York.				
Antonio Puerto	Cartagena	New York	2,100	
Enrique Ujueta	Cartagena	New York	1,500	3,600
NOVEMBER 10. By the S. S. *Gen. G. W. Goethals*, at New York.				
G. Amsinck & Co., Inc.	Cristobal	New York	2,250	
Various	Cristobal	New York	4,100	6,350
NOVEMBER 10. By the S. S. *Baltic*, at New York.				
Fred Stern & Co.	Liverpool	New York	4,509	4,509
NOVEMBER 10. By the S. S. *Vindal*, at New York.				
G. Amsinck & Co., Inc.	Cartagena	New York	17,250	17,250
NOVEMBER 17. By the S. S. *Matura*, at New York.				
Southern Sales Corp.	Trinidad	New York	33,840	
G. Amsinck & Co., Inc.	Trinidad	New York	13,200	
South & Central American Commercial Co.	Trinidad	New York	1,950	
Various	Trinidad	New York	840	49,830

GUTTA PERCHA.

OCTOBER 27. By the S. S. *Prometheus*, at New York.				
United Malaysian Rubber Co., Ltd.	Singapore	New York	33,590	33,590
NOVEMBER 15. By the S. S. *Bawean*, at New York.				
L. Littlejohn & Co., Inc.	Batavia	New York	600	
United Malaysian Rubber Co., Ltd.	B'j'rmassin	New York	125,908	126,508
NOVEMBER 18. By the S. S. *Eurypylus*, at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	87,900	
United Malaysian Rubber Co., Ltd.	Singapore	New York	46,171	
Various	Singapore	New York	6,300	140,371
NOVEMBER 18. By the S. S. *Waaldyk*, at New York.				
United Malaysian Rubber Co., Ltd.	B'j'rmassin	New York	14,196	14,196

GUTTAS.

	Shipment from.	Shipped to.	Pounds.	Totals.
OCTOBER 27. By the S. S. *Prometheus*, at New York.				
Paterson, Simmons & Co.	Singapore	New York	12,900	
Various	Singapore	New York	34,000	46,900
NOVEMBER 18. By the S. S. *Eurypylus*, at New York.				
United Malaysian Rubber Co., Ltd.	Singapore	New York	2,400	2,400

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	September.			
	1918		1919.	
UNMANUFACTURED—*free:*	Pounds.	Value.	Pounds.	Value.
India rubber:				
From France	.....	.....	46,086	$31,576
United Kingdom	36,466	$15,387	2,923,810	1,237,056
Canada	554,791	277,351	42,930	19,555
Central America	12,956	4,782	46,198	14,888
Mexico	348,211	135,177	39,353	12,232
Brazil	2,948,487	969,324	8,147,297	2,495,311
Peru	4,744	3,282	79,177	32,108
Other South America	1,540	1,232	291,289	133,448
British East Indies	13,460,814	5,634,983	14,091,078	5,588,391
Dutch East Indies	2,575,072	1,016,443	4,359,356	1,739,439
Other countries	619,863	333,916	726,248	145,455
Totals	20,560,944	$8,391,877	30,792,822	$11,449,459
Balata	39,799	21,673	[illegible]	123,654
Guayule	.....	.....	.....	.....
Jelutong (Pontianak)	1,045,197	74,496	[illegible]	145,165
Gutta Percha	.....	.....	56,000	14,160
Totals	1,084,996	$96,169	[illegible]	$282,979
Rubber scrap	492,236	60,746	[illegible]	72,872
Totals, unmanufactured	22,138,176	$8,548,792	[illegible]	$11,805,310
Chicle (dutiable)	641,581	308,805	503,032	343,497
MANUFACTURED—*dutiable*				
India rubber and gutta percha	.....	$29,520	.....	$224,812
India rubber substitutes	315,946	30,940	112	98

EXPORTS OF DOMESTIC MERCHANDISE.

MANUFACTURED—				
Automobile tires[1]	.....	$1,320,966	.....	$2,120,477
All other tires[1]	.....	120,188	.....	136,907
Scrap and old	243,551	38,734	1,340,082	126,083
Reclaimed rubber	180,485	33,543	286,039	48,840
Belting, hose, and packing	.....	299,600	.....	414,814
Boots[1] ... *pairs*	74,454	340,350	28,542	75,659
Shoes[1] ... *pairs*	63,394	979,654	702,744	631,150
Druggists' rubber sundries[1]	.....	64,073	.....	108,929
Insulated wire and cables[1]	.....	548,640	.....	301,315
Other rubber manufactures[1]	.....	441,634	.....	4,313,668
Total, manufactured	561,884	$4,187,382	2,357,407	$8,277,842
Fountain pens ... *number*	7,202	6,145	47,971	43,816

EXPORTS OF FOREIGN MERCHANDISE.

UNMANUFACTURED—				
India rubber	72,540	$29,432	503,587	$219,675
Balata	112,000	62,100	3,712	2,789
Guayule	990	475	.....	.....
Jelutong (Pontianak)	1,565	164	.....	.....
Totals, unmanufactured	187,095	$92,171	507,299	$222,464
MANUFACTURED—				
India rubber	.....	$361	.....	.....
Gutta percha	.....	.....	.....	$5,546
Rubber substitutes, elasticon, etc.	.....	.....	.....	.....
Totals, manufactured	.....	$361	.....	$5,546
Chicle	1,560	1,112	.....	.....

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

MANUFACTURED—				
To Alaska:				
Belting, hose and packing	.....	$5,161	.....	$5,561
Boots and shoes ... *pairs*	8,771	16,509	5,882	14,483
Other rubber goods	.....	7,048	.....	6,491
Totals	8,771	$28,718	5,882	$26,535
To Hawaii:				
Belting, hose and packing	.....	$6,847	.....	$3,540
Automobile tires	.....	110,359	.....	86,649
Other tires	.....	1,442	.....	1,043
Other rubber goods	.....	6,611	.....	13,880
Totals	.....	$125,259	.....	$105,112
To Philippine Islands:				
Belting, hose and packing	.....	$19,432	.....	$22,296
Boots and shoes ... *pairs*	.....	.....	3,054	4,225
Tires	.....	81,256	.....	82,151
Other rubber goods	.....	8,563	.....	8,053
Totals	.....	$109,251	3,054	$116,725
To Porto Rico:				
Belting, hose and packing	.....	$824	.....	$4,703
Automobile tires	.....	65,883	.....	82,454
Other tires	.....	1,427	.....	468
Other rubber goods	.....	11,165	.....	16,807
Totals	.....	$79,299	.....	$104,432

[1] Details of exports of domestic merchandise by countries during September, 1919, are given on Pages 194-195 of this issue.

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	July.			
	1918.		1919.	
Unmanufactured—free:	Pounds.	Value.	Pounds.	Value.
India rubber:				
From United Kingdom...	127,690	$64,744	678,016	$310,[illegible]
Canada	239,572	117,179	174,362	80,[illegible]
Central America....	5,121	1,186	27,956	[illegible]
Mexico	197,477	78,006	1,155	252
Brazil	2,803,042	879,430	2,055,583	579,257
Other South America	130,471	37,869	179,562	67,963
British East Indies..	32,404,172	13,467,040	40,109,576	16,390,865
Dutch East Indies..	3,663,614	1,696,412	8,707,707	3,602,738
Other countries.....	877,410	454,955	703,891	271,183
Totals	40,448,569	$16,796,821	52,637,808	$21,312,269
Balata	180,513	$109,949	105,432	$86,104
Guayule	....	....	285,548	67,453
Jelutong (Pontianak)	846,660	74,090	4,000,945	437,606
Gutta percha	246,755	82,644	1,264,364	200,032
Totals	1,273,928	$266,683	5,656,289	$791,195
Rubber scrap	692,262	$49,841	1,014,464	$71,799
Totals, unmanufactured.	42,414,759	$17,113,345	59,308,561	$21,175,263
Chicle (dutiable)	409,216	221,156	795,190	530,146
Manufactured—dutiable:				
India rubber and gutta percha	......	$36,106	.....	$52,776
India rubber substitutes....	178,771	32,668	16	6

EXPORTS OF DOMESTIC MERCHANDISE.

Manufactured—				
Automobile tires[1]...........	......	$1,217,584	......	$1,570.017
All other tires[1].............	....	54,815	.....	38,766
Scrap and old..............	296,346	24,062	752,599	78,107
Reclaimed rubber	125,358	22,832	467,292	78,992
Belting, hose and packing[1]..	......	343,887	......	400.377
Boots[1] ....*pairs*	8,327	26,470	20,396	59,409
Shoes[1] ....*pairs*	62,717	56,304	131,412	114,436
Druggists' rubber sundries[1]..	......	53,670	......	74,733
Insulated wire and cables[1]..	......	477,448	......	659,893
Other rubber manufactures[1].	......	490,652	......	474,331
Totals manufactured.	492.748	$2,767,724	1,371,699	$3,549,061
Fountain pens	7,483	6,424	53,490	51,542

EXPORTS OF FOREIGN MERCHANDISE.

Unmanufactured—				
India rubber	352,263	$195,636	437,414	$199,046
Balata	61,857	43,530	44,657	20,599
Jelutong (Pontianak)	....	....	27,480	6,192
Totals unmanufactured	414,120	$239,166	509,551	$225,837
Scrap	777	$23	......	......
Manufactured—				
India rubber	......	521	......	......
Gutta percha	......	......	......	$3,550
Rubber substitutes, elasticon, etc.	44,293	9,463	......	......
	44,970	$10,007	......	$3,350
Chicle	13,810	12,548	......	......

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

Manufactured—				
To Alaska:				
Belting, hose and packing	......	$1,961	......	$8,678
Boots and shoes....*pairs*	1,124	4,223	5,721	15,574
Other rubber goods....	......	1,706	......	6.657
Totals	1,124	$7,890	5,721	$30,909
To Hawaii:				
Belting, hose and packing	......	948	......	6,740
Automobile tires........	......	12,343	......	43,811
Other tires	......	36	......	1,841
Other rubber goods.....	......	264	......	11,333
Totals	......	$13,591	......	$63,725
To Philippine Islands:				
Belting, hose, and packing	......	30,685	......	12,633
Boots and shoes....*pairs*	534	724	5,359	7,859
Tires	......	53,248	......	48,976
Other rubber goods....	......	11,015	......	18,574
Totals	534	$95,672	5,359	$88,042
To Porto Rico:				
Belting, hose and packing	......	4,393	......	3,761
Automobile tires	......	74,931	......	132,865
Other tires	......	1,325	......	1,348
Other rubber goods......	......	9,178	......	21,754
Totals	......	$89,827	......	$159,728

[1] Details of exports of domestic merchandise by countries during July, 1919, were given on page 63 of the October issue.

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	August.			
	[illegible]			
Unmanufactured—free:	Pounds	Value	[illegible]	[illegible]
India rubber:				
From France	..	......	129,960	[illegible]
Portugal			....	
United Kingdom ..	[illegible]	$[illegible]	1,760,940	[illegible]
Canada	[illegible]	[illegible]	52,321	[illegible]
Central America			9,487	[illegible]
Mexico	[illegible]	[illegible]	5,466	[illegible]
Brazil	1,905,367	[illegible]	2,598,977	[illegible]
Peru ..	.	.	244,438	[illegible]
Other South America	[illegible]	[illegible]	179,514	87,749
British East Indies.	14,444.522	6,492,061	17,108,838	[illegible],918,405
Dutch East Indies .	[illegible]	1,383,705	44,850	16,893
Other countries .	707,288	399,494	325,042	123,021
Totals	21,466,582	$[illegible]	22,459,833	$8,785,941
Balata .	[illegible]	[illegible]	[illegible]	[illegible]
Guayule	58,686	[illegible]		
Jelutong (Pontianak)	[illegible]	[illegible]	[illegible]	[illegible]
Gutta percha	2,217	4,900	316,575	65,798
Totals .	2,082,303	[illegible]	[illegible]	[illegible]
Rubber scrap	621,564	[illegible]	649,[illegible]	[illegible]
Totals, unmanufactured.	24,170,449	$9,520,906	24,450,166	$9,086,343
Chicle (dutiable)	255,138	144,724	377,187	229,748
Manufactured—dutiable:				
India rubber and gutta percha	....	53,609	....	46,284
India rubber substitutes....	1,248,731	171,957	18,816	3,127

EXPORTS OF DOMESTIC MERCHANDISE.

Manufactured—				
Automobile tires[1]	....	$1,418,589	.. . .	$2,351,064
All other tires[1]............	....	64,667	. . .	110,573
Scrap and old.............	81.629	4,265	1,[illegible]	90,118
Reclaimed rubber	172,516	31,549	[illegible]	50,675
Belting, hose, and packing[1].	......	444,210	. ..	518,310
Boots[1] ....*pairs*	33,418	113,583	30,[illegible]	78,745
Shoes[1]	231,161	641,529	64[illegible]	459,142
Druggists' rubber sundries[1]		[illegible]	..... .	95,938
Insulated wire and cables[1]..	. . .	677,485	.....	741,443
Other rubber manufactures[1].	...	640,525	. ... .	789,177
Totals, manufactured..	518,724	$4,105,152	2,013,25[illegible]	$5,[illegible]
Fountain pens.......*number*	13,109	9,328	27,334	23,103

EXPORTS OF FOREIGN MERCHANDISE.

Unmanufactured—				
India rubber	229.484	$118,502	254,263	$1[illegible]
Balata	..... .	....	5,900	[illegible]
Gutta percha	.. ....	....	....	....
Jelutong (Pontianak).......	....	....	[illegible],672	481
Totals	229,484	$118,502	262,835	$107,611
Rubber scrap	.....	......	422	$12
Totals, unmanufactured.	229,484	$118,502	263,257	$107,623
Manufactured—				
India rubber	......	$7,042	......	....
Gutta percha	....	....	....	$317
Rubber substitutes, elasticon, etc.	. ....	....	305	155
Totals, manufactured...	....	$7,042	305	$472

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

Manufactured—				
To Alaska:				
Belting, hose and packing	.....	$8,130	......	$9,164
Boots and shoes.....*pairs*	10,133	24,517	8,921	22,045
Other rubber goods......	....	4,776	....	5,621
Totals	10,133	$37,423	8,921	$36.760
To Hawaii:				
Belting, hose and packing	......	$9,637	....	$8,284
Automobile tires	....	62,334	....	80,186
Other tires	.... .	534	.. .	[illegible]
Other rubber goods......	.... .	7,223	. . .	[illegible]
Totals	......	$79,728	.. .	$99,194
To Philippine Islands:				
Belting, hose and packing	....	$9,937	.	$50,152
Boots and shoes.....*pairs*	...	.	[illegible]	26,444
Tires	......	143,153	....	97,311
Other rubber goods.....	....	83,054	. .	64,370
Totals	. ...	$236,144	. .	$238,277
To Porto Rico:				
Belting, hose and packing	. .	[illegible]		$4,819
Automobile tires		47,081	.	87,704
Other tires		[illegible]	. . .	667
Other rubber goods.......	.	1,519	. . .	16,528
Totals	. .....	$50,628	. ..	$109,718

[1] Details of exports of domestic merchandise by countries during August, 1919, were given on page 124 of the November issue.

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES, DURING THE MONTH OF SEPTEMBER, 1919.

Exported to— Countries.	Belting, Hose and Packing. Value.	Boots. Pairs.	Boots. Value.	Shoes. Pairs.	Shoes. Value.	Druggists' Rubber Sundries. Value.	Tires. Automobile. Value.	Tires. All Others. Value.	Insulated Wire and Cable. Value.	All Other Rubber Manufactures. Value.	Totals. Value.
Azores and Madeira Islands							$5,000				$5,000
Belgium		4	564	19[illegible]	$131	$1,155	129,161	$[illegible],255	$14,2[illegible]	$12,292	166,280
Denmark	$12,304	[illegible]	612	22,558	29,962	1,660	192,511	9,079	9,226	5,786	261,140
Finland	21,538										21,538
France	9,246			3,952	3,747	448	41,317	7	8,317	66,403	129,485
Greece	[illegible]			123	143	173	1,384			349	2,644
Iceland and Faroe Islands		1,961	2,484	1,36[illegible]	1,323	144	12,780		311	113	17,155
Italy				1,800	1,286	50				2,484	3,820
Netherlands	12,412			19,810	16,777	2,373	152,584	27,863	12,611	5,363	229,983
Norway	302	444	891	147,293	121,200	166	55,252	1,016	28,164	9,986	216,977
Portugal								110			110
Roumania	6,093						4,486			241	10,820
Russia in Europe							152				152
Spain	289			1,272	1,016	565	7,594	617		706	10,787
Sweden				39,574	23,967	2,624	261,709	12,990	17,287	24,631	343,208
Switzerland	7,302			87,940	59,876				6,319	4,286	77,783
Turkey in Europe				29,394	27,665						27,665
England	4,491	4,624	9,632	63,043	38,858	32,042	18,023		1,125	60,037	164,208
Scotland	1,910									173	2,083
Ireland				878	241						241
Totals, Europe	$76,482	7,281	$13,683	419,221	$326,192	$41,400	$881,953	$60,937	$97,582	$192,850	$1,691,079
North America.											
Bermuda	$99	7	$25	80	$138				$72	$151	$485
British Honduras	42			682	746		$47	$14		86	935
Canada	34,056	10,546	29,894	8,694	9,329	$24,463	113,697	10,383	37,603	253,985	513,410
Costa Rica	1,565					279	232	599		1,308	3,983
Guatemala	1,380			225	253	125	4,434	519	2,161	2,133	11,005
Honduras	1,448	300	909			407	2,217	47	350	685	6,063
Nicaragua	785					755	5,641		60	5,610	12,851
Panama	16,446	224	948	3,026	2,206	2,239	54,314	1,362	3,214	4,189	84,918
Salvador	536					291	2,444		209	3,090	6,570
Mexico	38,037	89	413	3,936	3,774	5,915	61,338	2,651	19,983	19,153	151,264
Miquelon, Langley, etc.	8	528	1,720	12	10						1,738
Newfoundland and Labrador	1,077	6,481	19,864	15,514	12,732	144	3,939	32	1,449	2,424	41,661
Barbados	44					62	7,135	215	219	271	7,946
Jamaica	1,206			798	485	21	13,106		860	450	16,128
Trinidad and Tobago	947						3,968	96	6	285	5,302
Other British West Indies	161			432	302		900	26	22	405	1,816
Cuba	23,799	48	231	20,638	14,151	4,065	87,232	3,972	18,248	21,919	173,617
Danish West Indies	369			15	24	3	613		141	134	1,284
Dutch West Indies	83			15	10	18	1,253	11		36	1,411
French West Indies	314			67	52		22,028	130	1,170	289	23,983
Haiti	1,973			229	276	85	5,238	32	663	133	8,400
Dominican Republic	1,777			183	217	1,578	7,582	565	2,767	2,424	16,910
Totals, North America	$126,152	18,223	$54,004	54,546	$44,705	$40,450	$397,358	$20,654	$89,197	$319,160	$1,091,680
South America:											
Argentina	$6,055			1,329	$1,311	$3,159	$138,019	$22,987	$14,898	$12,627	$199,056
Bolivia						9	4,359			569	4,937
Brazil	18,090	48	$144	526	394	811	49,085	353	8,849	2,908	80,634
Chile	3,989	228	1,182	242	250	421	17,911	157	9,320	1,793	35,023
Colombia	1,946			298	309	1,282	15,500	1,840	5,329	3,522	29,728
Ecuador	1,084			504	450	469	6,066	73	1,544	723	10,409
British Guiana	142			7	6		867		46	238	1,299
Dutch Guiana	78								2,781	54	2,913
Paraguay										525	525
Peru	1,770					966	12,401	292	805	1,340	17,574
Uruguay	1,421	35	123	284	390	669	36,487		1,226	11,695	52,011
Venezuela	2,139			35	27	1,744	52,225	353	1,412	1,403	59,303
Totals, South America	$36,714	311	$1,449	3,225	$3,137	$9,530	$332,920	$26,055	$46,210	$37,397	$493,412
Asia:											
Aden							$1,644				$1,644
China	$2,981	2	$2	5,972	$7,200	$3,087	18,797		$48,833	$3,041	83,941
Japanese China		150	1,100	3,350	3,945	45				7,508	12,598
Chosen				576	496	70	223		300	99	1,188
British India	1,040			936	896	274	29,557	$390	1,711	1,147	35,015
Straits Settlements	1,225			48	55		54,779	5,100	265	140	61,564
Dutch East Indies	3,724					40	24,636		643	180	29,223
French East Indies							88				88
Hongkong						206	3,843		256	441	4,746
Japan	4,248	2,120	4,149	93,306	98,880	1,201	28,248	1,315	807	32,118	170,966
Persia							525				525
Russia in Asia	23,708	49	330	103,659	131,975	516	572			495	157,596
Siam							64				64
Totals, Asia	$36,926	2,321	$5,581	207,847	$243,447	$5,439	$162,976	$6,805	$52,815	$45,169	$559,158
Oceania:											
Australia	$6,832			11,035	$6,452	$8,097	$78,581	$4,018	$5,257	$22,875	$132,112
New Zealand	54,884			2,264	1,788	747	140,000	5,769	1,209	11,324	215,721
Other British Oceania						137	683			150	970
French Oceania	35			48	80		1,035	595	17	142	1,904
German Oceania							1,592			241	1,833
Philippine Islands	22,296	84	$227	2,970	3,998	2,282	71,090	11,061	8,020	5,771	124,745
Totals, Oceania	$84,047	84	$227	16,317	$12,318	$11,263	$292,981	$21,443	$14,503	$40,503	$477,285
Africa:											
Belgian Kongo	$395			4	$5					$12	$412
British West Africa		1	$7				$16,280			165	16,452
British South Africa	54,081	321	708	1,512	1,289	$781	35,164	$1,001	$659	15,388	109,071
British East Africa				72	57	42			349		448
French Africa							40	12		7	59
Egypt	17					24	805			158	1,004
Totals, Africa	$54,493	322	$715	1,588	$1,351	$847	$52,289	$1,013	$1,008	$15,730	$127,446
Totals	$414,814	28,542	$75,659	702,744	$631,150	$108,929	$2,120,477	$136,907	$301,315	$650,809	$4,440,060

SHIPMENTS TO NON-CONTIGUOUS TERRITORY.

	Belting, Hose and Packing. Value.	Boots and Shoes. Pairs.	Boots and Shoes. Value.	Druggists' Rubber Sundries. Value.	Automobiles. Value.	Other. Value.	Insulated Wire and Cables. Value.	All Other Manufactures of Rubber. Value.	Totals. Value.
Hawaii	$3,540	11,234	$11,776	......	$86,649	$1,04[illegible]	.	$2,104	$116,346
Porto Rico ..	4,703	10,472	8,499	....	82,45[illegible]	46[illegible]		8,3[illegible]	114,904
Totals	$8,243	21,706	20,275	....	$169,1[illegible]3	$1,511	.	$10,412	$231,250

(*Compiled by the Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, D. C.*)

UNITED STATES CRUDE RUBBER IMPORTS FOR 1919 (BY MONTHS).

1919	Plantations	Paras	Africans	Centrals.	Guayule.	Maniçoba and Matto Grosso	Totals for 1919.	Totals for 1918
January	4,906	2,141		114	72	..	7,235	16,084
February	14,070	2,701	486	1[illegible]	87	..	17,456	13,108
March	23,680	3,868	337	211	187	.	28,[illegible]3	17,161
April	24,678	2,754	90	144	380	110	28,146	13,425
May	14,856	777	389	97	234	.	16,348	16,288
June	13,645	1,706	264	263	390	51	16,319	24,124
July	17,645	1[illegible]	16	8	101	.	17,965	16,092
August	8,221	2,594	137	74	41	.	11,067	10,421
September	10,143	3,193	31	51	11	96	14,036	5,353
October	25,483	2,590	508	108	25	174	28,888	9,509

(*Compiled by The Rubber Association of America, Inc.*)

UNITED KINGDOM RUBBER STATISTICS.

IMPORTS.

	September. 1918 Pounds.	1918 Value	1919. Pounds.	1919. Value.
UNMANUFACTURED				
Crude rubber:				
From				
Dutch East Indies..........	252,600	£29,054	2,261,600	£229,243
French West Africa........	91,200	7,199	6,700	560
Gold Coast	97,500	6,261	7,200	717
Other African countries....	744,600	66,301	135,800	11,762
Peru	400	55	158,700	15,452
Brazil	13[illegible],600	15,114	1,479,900	159,426
British India	217,100	24,579	297,000	30,349
Straits Settlements and dependencies, including Labuan	2,937,200	344,715	5,893,800	597,163
Federated Malay States......	1,698,300	196,585	2,055,000	204,081
Ceylon and dependencies... ..	2,252,800	241,71[illegible]	1,551,100	150,133
Other countries	246,300	22,431	137,600	13,676
Totals	8,670,600	£954,006	13,984,400	£1,412,562
Waste and reclaimed rubber..	....	.....	391,700	10,054
Totals, unmanufactured	8,670,600	£954,006	14,376,100	£1,422,616
Gutta percha	813,900	£164,358	597,700	£116,084
MANUFACTURED				
Boots and shoes...*dozen pairs*	208	£742	31,260	£58,744
Waterproofed clothing			.....	37
Automobile tires and tubes...		53,019	.....	274,314
Motorcycle tires and tubes....	....	2,415	..	709
Bicycle tires and tubes.......	....	....	..	5,305
Insulated wire	..	.	.	70
Totals	208	£56,[illegible]6	31,260	£339,179

EXPORTS.

	1918 Pounds.	1918 Value	1919. Pounds.	1919. Value.
UNMANUFACTURED				
Waste and reclaimed rubber	263,300	£11,363	1,086,200	£22,510
MANUFACTURED				
Waterproof clothing		43,903	.....	151,527
Boots and shoes...*dozen pairs*	7,809	11,813	5,813	13,146
Insulated wire		8,823	....	74,207
Submarine cables	...	45,214	....	24,380
Carriage tires and tubes	..	14,274	..	20,151
Automobile tires and tubes	..	144,778	.	226,946
Motorcycle tires and tubes	.	11,021	..	34,532
Bicycle tires and tubes	.....	13,008	.	138,450
Other rubber manufactures	...	110,838	....	215,595
Totals	271,109	£415,035	1,092,013	£921,444

EXPORTS—COLONIAL AND FOREIGN.

	1918 Pounds.	1918 Value	1919. Pounds.	1919. Value.
UNMANUFACTURED—				
Crude rubber:				
To Belgium	....	....	757,300	£64,251
France	1,[illegible]	£213,[illegible]01	1,069,200	115,077
Italy	108,000	12,190	133,300	13,517
Russia	....	.	.	....
United States	24,700	1,[illegible]1[illegible]	2,917,800	283,005
Other countries	97,300	14,[illegible]	5,896,900	554,578
Totals	2,180,800	£241,914	10,774,500	£1,030,428
Gutta percha	....	....	115,400	£15,713
MANUFACTURED—				
Boots and shoes...*dozen pairs*		..		£210
Waterproof clothing				113
Automobile tires and tubes.	..	£2,760		1,336
[illegible] tires and tubes				17
Totals		£2,760	?	£1,[illegible]31

RUBBER STATISTICS FOR THE DOMINION OF CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	August. 1918 Pounds.	1918 Value.	1919 Pounds.	1919 Value.
UNMANUFACTURED				
Rubber, gutta percha, etc.				
From United Kingdom	[illegible]	$14,731	256,494	$110,790
United States	537,[illegible]1	265,214	472,119	193,626
British East Indies:				
Ceylon	[illegible]	73,937	.....	.....
Straits Settlements	[illegible]	360,149	433,500	163,951
India	300	198	....	....
Other countries		......	500	177
Totals	1,722,742	$714,229	1,162,613	$473,538
Rubber, recovered	189,417	$32,282	296,476	$49,307
Hard rubber sheets and rods....	3,919	2,927	5,871	1,991
Hard rubber tubes.............	...	906	......	1,652
Rubber, powdered and rubber or gutta percha scrap.	131,937	16,029	315,885	19,790
Rubber thread, not covered.....	1,983	2,906	2,532	3,410
Rubber substitute	76,102	8,154	67,300	8,246
Totals, unmanufactured	2,126,100	$774,436	1,880,677	$557,934
Balata	....	....	....	....
Chicle	4,[illegible]	$2,948	217,003	$182,584
MANUFACTURED (*dutiable*)				
Boots and shoes.............		13,126	.....	22,528
Waterproofed clothing	....	5,305	....	12,885
Belting, hose and packing..	..	43,294	43,294	24,718
Gloves and hot-water bottles		(1)	.....	1,645
Tires	..	68,016	....	133,528
Other manufactures	..	141,753	....	182,329
Totals, manufactured	..	$271,494	......	$374,633
Totals, imports	...	$1,048,878	....	$1,115,151

[1] Included in "Other manufactures."

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	August. 1918 Produce of Canada. Value	1918 Reexports of Foreign Goods. Value	1919 Produce of Canada. Value	1919 Reexports of Foreign Goods. Value
UNMANUFACTURED				
Crude and waste rubber	$1,[illegible]03	..	$24,366	....
MANUFACTURED				
Hose	[illegible]		11,60[illegible]	.
Boots and shoes	416,740	$637	17[illegible],202	$187
Clothing	[illegible]	......	3,889	12
Tires	310,611	426	727,521	598
Waste		....	....	17,536
Belting	1,[illegible]	......	647	......
All other	16,511	346	22,119	2,086
Totals	$761,868	$1,409	$962,346	$20,419
Chicle		.	$114,151	....
Totals, exports	$761,868	$1,409	$1,076,497	$20,419

RUBBER STATISTICS FOR ITALY.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	Four Months Ended April. 1918 Quintals.[1]	1918 Lire.[2]	1919 Quintals.	1919 Lire.
UNMANUFACTURED				
India rubber and gutta percha—raw and reclaimed:				
From Great Britain	3,363			
India and Ceylon........	1,263		17,856	....
Straits Settlements	8,860		12,719	....
French African Colonies	[illegible]		1,007	....
Belgian Congo	[illegible]		94	..
Brazil	1,870		11,580	....
Other countries	[illegible]		915	.
Totals	[illegible]	[illegible]	43,671	48,038,100
Rubber scrap	[illegible]	[illegible]	22	1,44[illegible]

UNITED KINGDOM RUBBER STATISTICS.

IMPORTS.

	Four Months Ended April			
	1918		1919	
	Quintals [1]	Lire [2]	Quintals	Lire.
MANUFACTURED				
India rubber and gutta percha, raw and reclaimed				
Threads	90	198,000	[illegible]	70,600
Sheets				
Cut sheets				4,400
Other kinds, including hard rubber	13	[illegible]	82	98,400
Tubes				
Hose	[illegible]	[illegible]	34	30,600
Other forms	......		17	18,700
Belting	255	[illegible]	84	92,400
Rubber-coated fabrics				
For carding comb	78	101,400	108	140,400
Other forms	3	4,500	9	13,500
Boots and shoes—pairs	12,833	153,990	9,526	114,312
Elastic webbing	59	118,000	88	176,000
Manufacturers, n. e. s:				
From cut sheets	4	10,400	3	7,800
Elastic fabric	312	374,400	1,070	1,284,000
From France	985	2,212,200	1,859	3,830,400
Great Britain	244		269	
Other rubber manufactures:				
Tires and tubes:				
From France	1,174		241	
Great Britain	425	2,053,200	5,846	7,312,800
United States	111		7	
Other countries	1		—	
Totals, manufactured		5,583,396	.....	13,394,312
Total imports		25,734,656	.....	61,433,852

EXPORTS OF CRUDE AND MANUFACTURED RUBBER.

	Quintals	Lire	Quintals	Lire
UNMANUFACTURED				
India rubber and gutta percha—raw and reclaimed:				
To Spain	585	245,000	1,726	915,600
To United States	115		890	
Totals		245,000	....	915,600
MANUFACTURED:				
India rubber and gutta percha—				
Threads	18	39,600	126	277,200
Sheets:				
Cut sheets	6	12,000	39	78,000
Elastic fabric	20	16,000	1	800
Other kinds, including hard rubber	20	20,000	12	12,000
Tubes:				
Inner tubes	3	6,600	12	26,400
Hose	86	68,800	132	105,600
Other forms	64	60,800	105	99,750
Belting	35	35,000	94	94,000
Rubber-coated fabrics—*pieces*	38	45,600	42	50,400
Elastic webbing	262	497,800	272	516,800
Clothing and articles for travel	3	8,400	1	2,800
Manufactures of india rubber and gutta percha, n. e. s.:				
From cut sheets	45	99,000	42	92,400
Elastic fabrics	57	62,700	62	68,200
Tires and tubes:				
To France	190		83	
To Great Britain	971		1,493	
Spain	81		2	
Switzerland	...		4	
British India and Ceylon	.	3,074,500	100	4,849,000
Dutch East Indies	141		......	
Straits Settlements	...		130	
Argentina	4		274	
Brazil	134		303	
Other countries	244		1,341	
Other rubber manufactures:				
To France	70		63	
Great Britain	86		50	
Spain	7		5	
Switzerland	109		29	
Egypt	21	404,000	9	471,000
Argentina	31		58	
Brazil	17		11	
Uruguay	8		5	
Other countries	55		241	
Totals, manufactured		4,450,800	....	6,744,350
Total exports		4,695,800		7,659,950

[1] A quintal = 220.46 pounds.
[2] A lira = $0.193.

THE MARKET FOR RUBBER SCRAP.

NEW YORK.

THE RUBBER SCRAP MARKET continues to show no increase in activity. Transactions in boots and shoes furnished the bulk of the business. The mechanical scrap market has been without incident in the absence of all demand on the part of reclaimers. In tires the only business has been between dealers for picking purposes and the salvage of fabric for the tire rebuilding trade. Prices in all grades of rubber scrap continue strictly nominal and there is scarcely sale for any grade.

QUOTATIONS FOR CARLOAD LOTS DELIVERED.

NOVEMBER 25, 1919.

Prices subject to change without notice.

BOOTS AND SHOES:				
Arctic tops	lb.	.01	@	
Boots and shoes	lb.	.08⅜	@	.08½
Trimmed arctics	lb.	.06½	@	.06⅝
Untrimmed arctics	lb.	.05⅝	@	
HARD RUBBER:				
Battery jars, black compound	lb.	.01	@	
No. 1, bright fracture	lb.	.23	@	.24
INNER TUBES:				
No. 1, old packing	lb.	.19	@	.20
No. 2	lb.	.10½	@	.10¾
Red	lb.	.10	@	.10½
MECHANICALS:				
Black scrap, mixed, No. 1	lb.	.03½	@	.04
No. 2	lb.	.03	@	
Car springs	lb.	.03½	@	.04
Heels	lb.	.03	@	.03½
Horse-shoe pads	lb.	.03	@	.03½
Hose, air brake	lb.	.04¼	@	
fire, cotton lined	lb.	.01½	@	.01¾
garden	lb.	.01½	@	.01¾
Insulated wire stripping, free from fiber	lb.	.03½	@	.04
Matting	lb.	.01¼	@	.01½
Red packing	lb.	.05½	@	.06
Red scrap, No. 1	lb.	.09	@	.10
No. 2	lb.	.06¾	@	.07¼
		.10	@	.11
		.08	@	.09
TIRES:				
PNEUMATIC—				
Auto peelings, No. 1	lb.	.07	@	.08
No. 2	lb.	.05	@	.05½
Bicycle	lb.	.03	@	.03¼
Standard white auto	lb.	.03¾	@	.03⅞
Standard mixed auto	lb.	.04	@	
Stripped, unguaranteed	lb.	.03	@	
White, G. & G., M. & W., and U. S.	lb.	.05	@	.05¼
SOLID—				
Carriage	lb.	.04	@	.04¼
Irony	lb.	.01	@	
Truck	lb.	.03½	@	.03¾

THE MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

AMERICAN COTTON. In November the spot price for middling uplands cotton advanced steadily in a speculative market until the middle of the month. It had reached 38.40 cents in the last week of October and kept going up till it reached 40.20 cents on November 11, that being the highest price for the month. For a week longer it kept a shade under 40 cents until the break in the stock market, when it dropped suddenly a hundred points, falling to 38.65 cents on November 18. It then climbed up again to 39.25 cents on November 22.

EGYPTIAN COTTON. The market during November has undergone another great rise, but now seems steady for the time being. Medium to good Sakellarides is quoted at 75 to 80 cents; upper Egyptian is practically all sold and only a small supply of very high grades is available. Low grade Sakellarides is also scarce. The total crop is estimated at just under 6,250,000 cantars and though the total of Egyptian sales is larger than usual it is believed that a good deal of the cotton is in the hands of speculators.

AMERICAN-EGYPTIAN COTTON. The Egyptian from Arizona is quoted at 85 to 90 cents, with few recent sales at the higher figure. The crop estimate is now a little under 50,000 bales for the season. Ginning is progressing steadily.

SEA ISLAND COTTON is moving very slowly. The crop is so small that it is practically negligible, but average extra choice is quoted at 85 cents and both Sea Island and Arizona long staple are a little ahead of the Egyptian cotton. The Government's estimate of the Sea Island crop, 15,000 tons, seems to be too high.

LONG-STAPLE COTTON of any kind that can be used for tire fabrics has been sold to the end of 1920, so that no prices are quoted; even the supply of 1¼ white cotton, or peelers, is oversold, and that is true of upper Egyptian also. Spinners of yarn are asking $2 a pound.

TIRE FABRICS. The scarcity of long-staple cotton has practically closed the market for tire fabrics. No cord fabrics are to

be had as the supply has been sold out to the end of 1920. All grades of cotton and cotton duck used in the manufacture of pneumatics have gone up from 35 to 40 per cent in the last six months and the cotton used in cord tires now costs more than the rubber. Even with inferior substitutes the demand cannot be met. Prices are nominal.

OTHER FABRICS. The excess of demand over supply holds good for other fabrics also, owing to the general shortage of the cotton crop. All supplies for next year are practically sold out, which affects the manufacture of waterproofing materials, of hose and belting, and also of sheetings and drills and ducks for 1920.

NEW YORK QUOTATIONS.

NOVEMBER, 25, 1919.

Prices subject to change without notice.

ASBESTOS CLOTH:				
Brake lining, 2½ lbs. sq. yd., brass or copper insertion	lb.	.90	@	.95
2¾ lbs. sq. yd., brass or copper insertion	lb.	.95	@	1.05
BURLAPS:				
32—7-ounce	100 yards	*12.50	@	
32—8-ounce		*13.50	@	
40—7½-ounce		13.50	@	13.55
40—8-ounce		13.50	@	13.60
40—10-ounce		17.75	@	17.80
40—10½-ounce		17.75	@	17.85
45—7½-ounce		*16.85	@	
45—8-ounce		*17.00	@	
45—9½-ounce		None		
48—10-ounce		*20.00	@	

DRILLS:				
38-inch 2.00 yard	yard *	[illegible]	@	
40-inch 2.47 yard	*	[illegible]	@	
52-inch 1.90 yard	*	[illegible]	@	
52-inch 1.95 yard		[illegible]	@	
60-inch 1.52 yard		[illegible]	@	
DUCK:				
CARRIAGE CLOTH:				
38-inch 2.00 yard enameling duck	yard *	[illegible]	@	
38-inch 1.74-yard		[illegible]	@	
72-inch 16.66 ounce	*	[illegible]	@	
72-inch 17.21 ounce	*	1.06	@	
MECHANICAL:				
Hose	pound *	.72	@	
Belting	*	[illegible]	@	
HOLLANDS, 40-INCH:				
Acme	yard	.30	@	
Endurance	*	.38	@	
Penn	*	.46	@	
OSNABURGS:				
40-inch 2.35-yard	yard *	.34	@	
40-inch 2.48-yard	*	.32¼	@	
37½-inch 2.42-yard	*	.33	@	
RAINCOAT FABRICS:				
COTTON:				
Bombazine 64 x 60 water-repellent	yard *	.24	@	
60 x 48 not water-repellent	*	.21	@	
Cashmeres, cotton and wool, 36-inch, tan		1.05	@	
Twills 64 x 72		.44	@	
64 x 102		.46	@	
Twill, mercerized, 36-inch		.57½	@	.60
Tweed		.60	@	.70
printed		.25	@	
Plaids 60 x 48		.22	@	
56 x 44		.21	@	
Repp		.45	@	.50
Surface prints 60 x 48		.22½	@	
64 x 60		.25	@	
IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING—PLAIN AND FANCIES:				
63-inch, 3¼ to 7½ ounces	yard	1.30	@	3.50
36-inch, 2¾ to 5 ounces		.75	@	1.90
IMPORTED PLAID LINING (UNION AND COTTON):				
63-inch, 2 to 4 ounces	yard	.90	@	1.85
36-inch, 2 to 4 ounces		.55	@	1.10
DOMESTIC WORSTED FABRICS:				
36-inch, 4½ to 8 ounces	yard	.65	@	1.50
DOMESTIC WOVEN PLAID LININGS (COTTON):				
36-inch, 3¾ to 5 ounces		.21	@	.32
SHEETINGS:				
40-inch, 2.35-yard	yard	.33	@	
40-inch, 2.50-yard		.31	@	
40-inch, 2.70-yard		.28¾	@	
40-inch, 2.85-yard		.27	@	
40-inch, 3.15-yard		.35	@	
40-inch, 3.60-yard		.25	@	
JACKET:				
Delaware	yard *	.30	@	
Schuykill	yard *	.37	@	
SILKS:				
Canton, 38-inch	yard	.72½	@	
Schappe, 36-inch		.87½	@	
TIRE FABRICS:				
17¼-ounce Sea Island, combed	pound	1.80	@	2.00
17¼-ounce Egyptian, combed		1.80	@	2.00
17¼-ounce Egyptian, carded		1.80	@	2.00
17¼-ounce, Peelers, combed		1.80	@	2.00
17¼-ounce Peelers, carded		1.10	@	1.20

*Nominal.

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

NEW YORK.

THE ABNORMAL DEMANDS for supplies by rubber goods manufacturers and the paint industry, together with the strikes of steel makers, coal miners and longshoremen, have produced an unprecedented shortage in all lines. In practically every line products are back-ordered several months and spot stocks are extremely low.

There has been a good demand for certain earths, clays and fillers, possibly as substitutes. It has been impossible to supply some of these lines for the reason that production has been limited.

ANILINE OIL. The demand exceeds the supply. During the past month prices have advanced three cents per pound.

Barytes. The mills are running out approximately their maximum production in spite of adverse labor conditions. European competition is expected as soon as normal trade relations are resumed.

Benzol. The steel workers' strike reduced the benzol output to 10 per cent of normal and now if the strike of the bituminous miners is not promptly terminated, production will cease. No spot stock is available.

Litharge. The demand very much exceeds the producing capacity and this condition may continue indefinitely.

Lithopone. The demand is record breaking and certain makers have been inclined to advance prices. This tendency has, for the present, however, been overruled and the price remains steady.

Sublimed Lead. The manufacturers report the demand out of all proportion to the supply. The price remains steady at about 8½ cents.

Sulphur. There is a uniform demand from consumers and prices are reasonable and steady.

Whiting. The importation of chalk has been in an unsettled condition owing to British labor disturbances. For this reason the strong demand prevents accumulation of stocks.

Zinc Oxide. The mills are operating 24 hours per day, but are unable to meet the demand, which is particularly notable on the part of makers of automobile tires. Prices remain unchanged.

NEW YORK QUOTATIONS.

November 25, 1919.

Subject to change without notice.

ACCELERATORS, ORGANIC				
Accelerator, N. C. C.	lb.	$0.50	@	
Accelerene, New York	lb.	4.75	@	
Accelemal	lb.	.55	@	
Aldehyde ammonia crystals	lb.	1.15	@	1.25
Aniline oil	lb.	.32	@	
Excellerex	lb.	.65	@	.75
Hexamethylene tetramine (powdered)	lb.	1.05	@	1.15
Paraphenylenediamine	lb.	2.50	@	2.75
Thiocarbanilide	lb.	.55	@	
ACCELERATORS, INORGANIC.				
Lead, dry red (bbls.)	lb.	.10¼	@	
sublimed blue (bbls.)	lb.	.08¼	@	
sublimed white (bbls.)	lb.	.08¼	@	
white, basic carbonate (bbls.)	lb.	.09	@	
Lime, flour	lb.	.02	@	.02½
Litharge, domestic	lb.	.09¼	@	.10¼
sublimed	lb.	.10	@	
imported	lb.	.14	@	.15
Magnesium, carbonate	lb.	.12½	@	
calcined heavy (Thistle)	lb.	.11	@	
light (Manhattan)	lb.	.35	@	
Magnesium oxide	lb.	.25	@	
Magnesite	lb.	.04	@	
ACIDS.				
Acetic, 28 per cent (bbls.)	lb.	.03	@	
glacial, 99 per cent (carboys)	lb.	.12	@	
Cresylic (97% straw color)	gal.	.80	@	
(95% dark)	gal.	.75	@	
Muriatic, 20 degrees	cwt.	1.75	@	2.00
Nitric, 36 degrees	lb.	.06	@	.06½
Sulphuric, 66 degrees	ton	[illegible]	@	
ALKALIES.				
Caustic soda, 76 per cent (bbls.)	lb.	.05	@	
Soda ash (bbls.)	lb.	.03½	@	
COLORS.				
Black				
Bone, powdered	lb.	.05	@	
granulated	lb.	.09	@	
Carbon black (sacks, factory)	lb.	.13	@	
Drop	lb.	.06	@	.15
Ivory black	lb.	.16	@	.30
Lampblack	lb.	.15	@	
Oil soluble aniline	lb.	1.25	@	
Rubber black	lb.	.07½	@	
Blue:				
Cobalt	lb.	.25	@	.35
Prussian	lb.	.65	@	.75
Ultramarine	lb.	.18	@	.40
Brown				
Iron oxide	lb.	.03	@	.03½
Sienna, Italian, raw and burnt	lb.	.05	@	.15
Umber, Turkey, raw and burnt	lb.	.05	@	.06
Vandyke	lb.	.02½	@	.03½
Green				
Chrome, light	lb.	.35	@	.40
medium	lb.	.40	@	.50
dark	lb.	.50	@	.60
commercial	lb.	.07	@	.15
Oxide of chromium (casks)	lb.	.75	@	.90
Red:				
Antimony, crimson, sulphuret of (casks)	lb.	.40	@	
Antimony, golden sulphuret of (casks)	lb.	.35	@	
golden sulphuret (States)	lb.	.30	@	
red sulphuret (States)	lb.	.25	@	
vermilion sulphuret	lb.	.55	@	
Arsenic, red sulphide	lb.	[illegible]	@	
Indian	lb.	.14	@	
Toluidine toner	lb.	3.50	@	
Iron oxide, reduced grades	lb.	.03	@	.13
pure bright	lb.	.16	@	
Spanish	lb.	.03½	@	
Venetian	lb.	.05	@	
Oil soluble aniline, red	lb.	2.00	@	
orange	lb.	1.75	@	
Oximony	lb.	.18	@	
Vermilion, English, pale, medium, dark	lb.	1.35	@	
artificial	lb.	.3[illegible]	@	
English quicksilver	lb.	1.45	@	1.50
White:				
Aluminum bronze, C. P.	lb.	.55	@	
superior	lb.	.60	@	
Lithopone, domestic	lb.	.07	@	.07¼
Ponolith (carloads, factory)	lb.	.07	@	.07¼
Rubber-makers' white	lb.	.06½	@	.06¾
Zinc oxide, Horsehead (less carload, factory):				
"XX red"	lb.	.09	@	.09¼
"Special"	lb.	.09½	@	.09¾
French process, red seal	lb.	.09½	@	.09¾
green seal	lb.	.10½	@	.10¾
white seal	lb.	.11½	@	.11¾
(States)	lb.	.08½	@	
Azo, ZZZ, lead free (less carload factory)	lb.	.09¼	@	
ZZ, under 5% leaded (less carload factory)	lb.	.08¾	@	
Z, 8-10% leaded (less carload factory	lb.	.08¼	@	
Yellow:				
Cadmium, sulphide, yellow, light, orange	lb.	2.00	@	
red	lb.	1.85	@	
Chrome, light and medium	lb.	.27	@	
Ochre, domestic	lb.	.02½	@	.03½
imported	lb.	.05	@	.06½
Oil, soluble aniline	lb.	2.00	@	
Zinc chromate	lb.	.40	@	
COMPOUNDING INGREDIENTS.				
Aluminum flake	ton		@	
Aluminum oxide	lb.	*.18	@	
Ammonia carbonate, powdered	lb.	.13¼	@	.14
Asbestine (carloads)	ton	25.00	@	
Asbestos (bags)	ton	35.00	@	
Avoilas compound	lb.	.16	@	
Barium, carbonated, precipitated	ton	65.00	@	
sulphide, precipitated	ton	.07	@	
dust	lb.	.04	@	
Barytes, pure white	ton	37.50	@	40.00
Barytes, off color	ton	18.00	@	20.00
uniform floated	ton	37.00	@	40.00
Basofor	lb.	.04	@	
Blanc fixe	lb.	.04	@	
Bone ash	lb.	.06	@	
Chalk, precipitated, extra light	lb.	.05	@	.05½
precipitated, heavy	lb.	.04	@	.04½
China clay, domestic	ton	8.50	@	20.00
imported	ton	18.00	@	23.50
Shawnee	ton	15.00	@	
Cork flour	lb.	.53	@	
Cotton linters, clean mill run, f. o. b. factory	lb.	.04	@	.04½
Fossil flour (powdered)	ton	50.00	@	
(bolted)	ton	60.00	@	
Diatomite	lb.	.03	@	
Glue, high grade	lb.	.20	@	.40
medium	lb.	.15	@	.19
low grade	lb.	.11	@	.14
Graphite, flake (400-pound bbl.)	lb.	.10	@	.30
amorphous	lb.	.04	@	.08
Ground glass FF. (bbls.)	lb.	.03	@	
Infusorial earth (powdered)	ton	50.00	@	
(bolted)	ton	60.00	@	
Liquid rubber	lb.	.16½	@	
Mica, powdered	lb.	.10	@	
Pumice stone, powdered (bbl.)	lb.	.05	@	
Rotten stone, powdered	lb.	.02½	@	.04½
Rub-R-Glu	lb.	*.20	@	.25
Silex (silica)	ton	22.00	@	40.00
Starch, powdered corn (carload, bbls.)	cwt.	5.34	@	
(carload, bags)	cwt.	5.12	@	
Talc, powdered soapstone	ton	15.50	@	17.50
Tripoli earth, air-floated	ton	25.00	@	
Tyre-lith	ton	85.00	@	
Whiting, Alba (carloads)	cwt.	.80	@	.90
Columbia	cwt.	.80	@	
commercial	cwt.	1.25	@	
English cliffstone	cwt.	1.75	@	2.00
gilders	cwt.	1.35	@	
Paris, white, American	cwt.	1.75	@	
Quaker	cwt.	.70	@	.80
Wood pulp, imported	lb.	.03½	@	
Wood flour, American	lb.	.01¾	@	

MINERAL RUBBER.

Gilsonite	ton	[illegible]	@	[illegible]
Genasco (carloads, factory)	ton	55.00	@	
(less carloads, factory)	ton	57.00	@	
Hard hydrocarbon	ton	30.00	@	
K. W.	ton	110.00	@	
K. M. R.	ton	*40.00	@	60.00
M. R. X.	ton	100.00	@	
Pioneer, carload, factory	ton	55.00	@	
less carload, factory	ton	57.00	@	
Raven M. R.	ton	.50	@	.70
Refined Elaterite	ton	175.00	@	
Richmond	ton	75.00	@	
No. 64	ton	44.00	@	
318/320 M. P. hydrocarbon	ton	50.00	@	
Robertson, M. R. Special (carloads, factory)	ton	80.00	@	
M. R. (carloads, factory)	ton	55.00	@	60.00
Walpole rubber flux (factory)	lb.	.05	@	

OILS.

Castor, No. 1, U. S. P.	lb.	.22½	@	
No. 3, U. S. P.	lb.	.18½	@	
Corn, refined Argo	cwt.	23.56	@	
Cotton	lb.	.22	@	
Glycerine (98 per cent)	lb.	.21	@	
Glycerole	lb.	.55	@	
Linseed, raw (carloads)	gal.	1.00	@	
Linseed compound	gal.	*85	@	
Palm (Niger)	lb.	.17½	@	
Peanut	lb.	.23	@	
Petrolatum	lb.	.06	@	.06¼
Petroleum grease	lb.	.04¾	@	
Pine, steam distilled	gal.	1.28	@	
Rapeseed, refined	gal.	.21	@	
blown	lb.	.21	@	
Rosin	bbl.	18.00	@	
Soya bean	lb.	.18	@	
Tar	gal.	.30	@	.40

RESINS AND PITCHES.

Cantella gum	lb.	.55	@	
Tar, retort	bbl.	15.00	@	15.50
kiln	bbl.	14.50	@	15.00
Pitch, Burgundy	lb.	.09	@	
coal tar	bbl.	7.50	@	
pine tar	lb.	.03½	@	
ponto	lb.	.14	@	
Rosin	bbl.	None		
granulated	lb.	None		
fused	lb.	None		
Rosin, K	bbl.	19.00	@	
Shellac, fine orange	lb.	1.20	@	

SOLVENTS.

Acetone (98.99 per cent drums)	lb.	.15	@	
methyl (drums)	gal.	1.15	@	
Benzol, water white	gal.	.24	@	
Beta-naphthol, resublimed	lb.	1.00	@	
ordinary grade	lb.	.55	@	
Carbon bisulphide (drums)	lb.	.05½	@	.06¾
tetrachloride (drums)	lb.	.11	@	.12½
Naphtha, motor gasoline (steel bbls)	gal.	.24½	@	
73 @ 76 degrees (steel bbls.)	gal.	None		
68 @ 70 degrees (steel bbls.)	gal.	None		
Solvent	gal.	.20	@	
V. M. & P. (steel bbls.)	gal.	.23½	@	
Toluol, pure	gal.	.26	@	.30
Turpentine, spirits	gal.	1.71	@	
wood	gal.	1.65	@	
Osmaco reducer	gal.	.30	@	
Xylol, pure	gal.	.35	@	.40
commercial	gal.	.30	@	.35

SUBSTITUTES.

Black	lb.	.10½	@	.21
White	lb.	.11	@	.23
Brown	lb.	.15	@	.22
Brown factice	lb.	.09	@	.21
White factice	lb.	.11	@	.22
Paragol sift and medium (carloads)	cwt.	18.58	@	
hard	cwt.	18.08	@	

VULCANIZING INGREDIENTS.

Lead, black hyposulphite (Black Hypo)	lb.	.52	@	.56
Orange mineral, domestic	lb.	.13	@	
Sulphur chloride (drums)	lb.	.06½	@	
Sulphur, flour, Brooklyn brand (carloads)	cwt.	3.15	@	
pure soft (carloads)	cwt.	3.15	@	
superfine (carloads, factory)	cwt.	2.50	@	

(See also Colors—Antimony.)

WAXES.

Wax, beeswax, white	lb.	.65	@	.68
ceresin, white	lb.	.16	@	.18
carnauba	lb.	.47	@	.85
ozokerite, black	lb.	[illegible]	@	.63
green	lb.	.75	@	.78
Montan	lb.	[illegible]	@	.30
substitute	lb.	None		
paraffine, refined 118/120 m. p. (cases)	lb.	.08	@	
123/125 m. p. (cases)	lb.	.08¼	@	
128/130 m. p. (cases)	lb.	[illegible]	@	

*Nominal.

FOREIGN CUSTOMS CHANGES.

BELGIUM.

Rubber may be exported from Belgium without an export license. This ruling became effective September 19, 1915.

DENMARK.

Denmark has removed the export prohibition as regards motor vehicles complete, including covers and tires, but not that against the exportation of separate tires. Medical hand syringes and thermometers, bandaging materials and vulcanized fiber may also be exported.

FINLAND.

Finland has placed the following articles on the free list of imports: India rubber, gutta percha and balata; rubber sheets and other forms of packing; automobile tires, cycle and motorcycle parts of rubber, pedal and brake rubbers, inner tubing and the like; India rubber shoes, including goloshes; blocks and plates of hard rubber (ebonite, etc.), even in cut shapes; pipes, strands and rods in cut shapes, knife handles and packings of hard rubber.

BULGARIA.

Bulgaria now permits the importation of rubber and gutta percha, goloshes and rubber boots, transmission belting, waterproof stuffs of any vegetable textiles and for any purpose, and auto trucks, but not automobiles without the permission of the Department of Social Insurance.

LETTLAND.

Lettland, by the tariff law of March 26-April 2, 1919, will exact ad valorem customs duties of 5 per cent on crude gum and asbestos, and 10 per cent on rubber goods.

THE NETHERLANDS.

The prohibitions have been withdrawn against the exportation from the Netherlands of rubber, waste rubber, rubber, and gutta percha and articles manufactured therefrom, with the exception of motor and cycle tires and dental rubber.

SPAIN.

The export prohibition on manufactures of rubber, imposed by an order of April 24, 1915, has been removed by the Spanish Government, but the export of crude rubber and similar materials remains prohibited. Crude rubber is being imported without difficulties and it is believed that the export of rubber manufactures should be encouraged.

JAPAN.

The export prohibition on crude rubber and rubber manufactures in Japan has been removed.

BRAZIL.

In Brazil the separate states impose export duties. The State of Bahia now exacts 9 per cent ad valorem on exports of Mangabeira and Maniçoba rubber.

GERMANY.

Germany has recently established a free import list, articles included in which may be imported without license. Among these are: rubber, raw or purified; gutta percha, raw or purified; balata, raw or purified; rubber, gutta percha and balata scrap; worn out pieces of rubber; gutta percha and balata articles; asbestos fiber and refined asbestos; raw and ground abestos.

CZECHO-SLOVAKIA.

Czecho-Slovakia grants general licenses for the importation of crude rubber and of rubber and vulcanite goods, technical and surgical. The country is in urgent need of pneumatic tires, fire hose and other rubber goods.

ALUM PROHIBITED AS COAGULANT.

Alum is forbidden as a coagulant of rubber latex by the administrative officers of Perak, Selangor, Negri Sembilan and Pekang in the Federated Malay States. The regulation reads:

> Salts of alum and other aluminum salts shall not be used for the coagulation of *Hevea* latex or for the preparation of rubber therefrom either alone or in admixture with each other or in combination with any other substance or substances.

INDIA RUBBER WORLD
FOUNDED 1889

Vol. 61 DECEMBER 1, 1919. No. 3

TABLE OF CONTENTS.

Editorials: Pages

- Salvaging Rubber from the Deep .. 133
- Japanese Rubber Ambitions............. 133-134
- German Synthetic Asphalt..................... 134
- Industrial Training and Apprenticeship.. 134
- Fads in Industry.............................. 134

Rubber—The One Normal Commodity.
By Henry C. Pearson Portrait 135-136

The Effect of Organic Accelerators on the Vulcanization Coefficient ..... By D. F. Cranor—Charts 137-140

Some Methods of Testing the Hardness of Vulcanized Rubber ..... By H. L. Gurney—Illustrated 140-141

The Runge Solution Process for Rubber Reclaiming.
Special Correspondence 141-142

Giant Cord Tires for Motor Trucks......Illustrated 143-144

Peace Problems and Progress.................... 144

Rubber Factory Foremanship........By J. W. Cary 145-146

Long-Staple American-Egyptian Cotton..Illustrated 147

Interesting Letters from Our Readers.............. 148

Chemistry:
- What the Rubber Chemists Are Doing....... .. 149-150
  Studies in Vulcanization.
- Chemical Patents 150-151
- Laboratory Apparatus ....Illustrated 151

Machines and Appliances................Illustrated 152-153
"Herringbone" Reducing Gear Drives. Hydraulic Bicycle Tire Press. Solid Wooden Shells. A Novel Factory Signal. Electric Space Heaters. Circular Mandrels for Curing Inner Tubes.

Machinery Patents ....Illustrated 154-155
Machine for Applying Rubber Cement. Other Machinery Patents.

Process Patents 154

New Goods and Specialties..............Illustrated 155-157
The "[illegible]" "Flexmet" Tubing. A Shoe for Work-People. "Repairo" Self-Vulcanizing Patch. "Duxrane" for Automobile Tops. "Eagle" Puncture-Proof Tire. The "Never-Loosen" Heel. Plaid Traveling Case. Purse-Like Tobacco Container. Automatic Barrel Filler. Radio Head Set for Airplanes. A Rapson Non-slip Unpuncturable Tire. "Jiffy" for Golf Balls. "The "Hydromatic" Drain-Pipe Flusher. "Jiffy" Baby Pants. Pneumatic Metatarsal Arch Support. The "Pastime" Outing Balmoral. Automobile Mats. The "Antiglare" for Automobiles. "Diamond Grip" Heel.

Los Angeles Challenges Akron—By F. N. Shorey—
Illustrated 158-159

Practical Hints on Retreading. By A. B. Zwebell 159-160

Splicing Balata Belting ....Illustrated 160

Pilot Balloons ..Illustrated 160-161

New Incorporations 161

Editor's Book Table 162
"Determination of Permeability of Balloon Fabrics." "The Industrial Republic.'" "Extrait du Bulletin de la Société Industrielle de Rouen." "Direct Determination of India Rubber by the Nitrosite Method."

New Trade Publications 162

Judicial Decisions 163

Obituary Record 163
W. S. Alling (portrait). C. H. Cary. G. E. B. Putnam.

Inquiries and Trade Opportunities 166

The Rubber Association of America—Activities of... 164-165

Standardizing Checks, Vouchers and Invoices...... 165-166

American Rubber Trade—News Notes and Personals 167-169
- Financial Notes 167
- Dividends 167
- Harlan A. DePew ....Portrait and Sketch 168
- S. L. Warner ....Portrait and Sketch 172
- A. L. Pardee ....Portrait and Sketch 172
- C. E. Reiss ....Portrait and Sketch 173
- F. E. Partridge ....Portrait and Sketch 174

Domestic Correspondence:
- Ohio ....By Our Correspondent—Illustrated 173
- Mid-Western Notes 173
- Canadian Notes 174
- Pacific Coast Notes ......By Our Correspondent 174
- Massachusetts ....By Our Correspondent 175-176
- Rhode Island By Our Correspondent—Illustrated 176
- New Jersey ....By Our Correspondent 176-177
- Eastern Notes 177-178

Foreign Rubber Notes:
- Great Britain ....By Our Correspondent 179
- Rubber Sponge Manufacture in France and America 180
- German Rubber Market 180-181
- Miscellaneous Foreign Notes 181
- Rubber Trade in Australia.. .. ....Illustrated 181
- Foreign Customs Changes 199

Planting:
- Congo Rubber a Big Asset of Belgium.
  By S. P. Verner—Illustrated 182-184

Patents Relating to Rubber 185-187
United States. Canada. United Kingdom. New Zealand. Australia. Germany. France.

Trade-Marks 187
United States. Canada. New Zealand. France. Australia.

Designs ....Illustrated 187
United States. Canada.

Markets:
- Crude Rubber 188
- Highest and Lowest Prices..................... 188
  - Batavia Rubber Market 189
  - Singapore Rubber Auctions 189
- Reclaimed Rubber 188
- Rubber Scrap 196
- Cotton and Other Fabrics...................... 196-197
- Chemicals and Ingredients 197-199

Statistics:
- Antwerp Rubber Arrivals 189
- Brazil, Exports from Manáos 189
- Canada, Statistics for August 195
- Ceylon Imports and Exports 189
- Federated Malay States Rubber Exports........ 189
- Italy, Statistics for Four Months ending April.. 195-196
- Java Rubber Exports 189
- Straits Settlements Rubber Exports 189
- United Kingdom Statistics for September...... 195
- United States:
  - Crude Rubber Arrivals at Atlantic and Pacific Ports as Stated by Ships' Manifests......... 190-192
  - Statistics for July, August and September.... 192
  - Exports During August, 1919 (By Countries). 194
  - Imports by Months for 1919.................... 195

THE GUTTA PERCHA & RUBBER MFG. CO.

ESTABLISHED 1855

MANUFACTURERS OF

RUBBER BELTING, PACKING, HOSE, MATS, MATTING

AND

MECHANICAL RUBBER GOODS

OF EVERY KIND

Warerooms: Nos. 126-128 Duane St., NEW YORK

BRANCH STORES:

301 West Randolph St. CHICAGO | 71 Pearl Street BOSTON | 241 Chestnut Street PHILADELPHIA | 34 Fremont Street SAN FRANCISCO

HENRY SPADONE, Pres. | WALTER W. SPADONE, Vice-Pres. | ALFRED A. SPADONE, Sec'y | GEO. B. DICKERSON, Treas.

HOOD RUBBER CO.

MANUFACTURERS OF

Rubber Boots and Shoes

Rubber Sole Canvas Shoes

Tennis Shoes

Pneumatic Tires and Tubes

Solid Tires for Trucks

WATERTOWN, MASS.

63 YEARS

1856 1919

TYRIAN TRADE MARK ESTABLISHED 1856

Tyer Rubber Co., Inc.

Manufacturers of

DRUGGISTS' RUBBER GOODS

"TYRIAN"

Automobile Tires and Inner Tubes
Stationers' Rubber Bands

RUBBER MOLD WORK A SPECIALTY

ANDOVER, MASS., U. S. A.

H. A. ASTLETT & CO.

113-117 Pearl Street, New York

CABLE ADDRESS, "ASTLETT," NEW YORK

CRUDE
WASHED & REFINED
RUBBER

INDIA RUBBER WORLD

CAOUTCHOUC — HEVEA BRASILIENSIS

FOUNDED 1889

DICHOPSIS GUTTA — GUTTA-PERCHA

U. S. Pat. Off. Reg. United Kingdom

Edited by HENRY C. PEARSON

Vol. LXI. No. 4. JANUARY 1, 1920 35 CENTS $3.00 Per Year. $3.50 Abroad.

Entered as second-class matter October 4, 1889, at the post office at New York, N. Y., under the Act of March 3, 1879.
Published monthly at 25 West 45th Street, New York.

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC GUTTA-PERCHA

Reg. United States Pat. Off. Reg. United Kingdom.

Published on the 1st of each month by

THE INDIA RUBBER PUBLISHING CO

No. 25 West 45th Street, New York.

Telephone—Bryant 2576.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, F.R.G.S., Editor

Vol. 61. JANUARY 1, 1920. No. 4.

Subscription: $3.00 per year, $1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, $3.50 (or equivalent funds) per year, postpaid.

Advertising: Rates will be made known on application.

Remittances: Should always be made by bank draft. Post Office or Express money order on New York, payable to The India Rubber Publishing Company. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

Discontinuances: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

TABLE OF CONTENTS ON LAST PAGE OF READING.

New Year's Greetings!

A HAPPY NEW YEAR and a prosperous one! May all of our friends here and abroad have the good luck to wish wisely and their wishes be realized. Thus the rich promise of this new year, to our industry and to the world, will be fulfilled.

THE INDUSTRIAL RELATIONS COMMITTEE.

It is no exaggeration to state that as a whole, rubber workers are better paid, housed and looked after than laborers of any other great industry. This has been done wholly through the initiative of individual companies. This will continue without a doubt, but it is to be aided and strengthened by collective effort. This is forecast by the formation of an Industrial Relations Committee consisting of twenty-five firm members of The Rubber Association of America. The getting together of the great manufacturers for the purpose of exchanging views should be of the greatest benefit to employer and employe.

AMERICAN RUBBER PLANTATIONS IN MEXICO.

Not long ago there were 150 rubber plantations in Mexico, some of them very important undertakings. They were owned by American companies with headquarters in every important city from New York to San Francisco and from St. Louis to Chicago. They owned hundreds of thousands of acres of land, buildings, machinery—the best of equipment. They had cleared and planted great areas to rubber, coffee, cane and foodstuffs. They employed large forces of natives whom they housed, fed and paid well.

To-day, that whole industry has been destroyed, the buildings looted and burned, the plantations given over to the jungle, the laborers scattered. Furthermore the American superintendents and foremen, such as were not slain, have been driven from the country. And so far there seems to be no redress.

LABOR FAMINE NOT TO BE FEARED.

From many well-informed sources evidence is accumulating that manufacturers, business men, bankers and others fear a labor shortage. The era of spending that reached its climax during the Christmas holidays indicated a feeling on the part of laboring men that money is very plenty, that big wages are to continue, and their jobs secure.

The American Bankers' Association affirms that an alarming proportion of our 14,000,000 foreign born are drawing money from the banks, selling Liberty Bonds and houses and are preparing to return to Europe. The estimate made is that $4,000,000,000 will be carried away by the 1,500,000 workers who are leaving for home, just when the call for workers here is most acute. It is said that in one plant employing 12,000 foreign born men, 45 per cent have signified their intention of leaving this country and the superintendent declares that should even 15 per cent leave, he would not know how to replace them.

There is this to be remembered, however. We faced the severest sort of labor famine during the war that could be imagined, and most of the factories ran. There is to-day a new force of workers in the thousands of women who found congenial and remunerative work in many industries. The United States is also better prepared to create automatic and labor saving machinery than is any country in the world.

There is also the probability of employing the plentiful and cheap labor supply of the Orient. Consider the

Chinese labor supply for instance. Already certain European publishers of books, because of the high cost of printing and binding are having their work done in China and done well and cheaply. This, of course, is because of the abundance of cheap labor. Now that there is talk and perhaps danger of a labor famine in the United States, and because of the extremely high labor wage here, will not American manufacturers look Chinaward? We are barred by law, passed in the interest of American labor, from bringing the Chinese worker here. There is no law, however, forbidding one to take the work to him. That is why American mills, perhaps rubber mills, may ere long be operated in the Flowery Kingdom. Incidentally China is very near the vast crude rubber supply of the Malay States and the Dutch Indies.

PLANTING HEVEA IN THE PHILIPPINES.

WORK is going on, steadily but slowly, in the direcrection of planting new rubber areas in the Philippine Islands, particularly in Mindanao, where large tracts have been cleared in the last 20 months to be planted to *Hevea*. This is chiefly the work of Dr. J. W. Strong, representing American capitalists.

There is a wonderful field for rubber plantations in the southern islands and the Department of the Interior in the Philippines would do well to discover why American capital does not come in more rapidly. If it is the fault of existing laws, surely the Filipinios will have them corrected.

"TECH'S" NEW INDUSTRIAL PLAN.

A PLAN which has been adopted by the Massachusetts Institute of Technology is destined to be of great advantage to manufacturers in general if it touches the popular key-note which is intended. In brief, it is to place at the disposal of the various industries of the country all the resources of the great Boston institution, its magnificent library, its consultant staff, experience and general knowledge, upon the payment of a certain annual fee. The advantage to industry is comprehended in the opportunity of obtaining the most skilled advice and experience in the world in solving the various technical problems which constantly arise, many of which are beyond the ken of the average consultant. The idea was advanced in connection with the appeal for the raising of funds which has been recently made. The Institute would virtually be retained by the various industries which subscribe to the plan exactly as though it were a private firm of consulting chemical engineers.

AN AMERICAN RUBBER RESERVE.

A YEAR or more ago it was seriously proposed that a reserve of crude rubber be created in the United States. It was to be held against failure of overseas crops, embargoes, or prohibitive prices. If we remember rightly, 100,000,000 pounds was deemed an amount that would be sufficient for the purpose. Of course there was the financial handicap of interest upon the investment, insurance, and deterioration, to be met and overcome, but those were mere details.

According to a report just issued by the University of California, summarized elsewhere, an even greater reserve is already established. The report, the work of Professor Harvey Monroe Hall and his colleague, Thomas Harper Goodspeeed, relates to the existence of millions of pounds of "Chrysil rubber" in our western states, a supply of notable value if the present sources fail or if prices go to the $3-mark again. Three hundred million pounds of crude rubber, which is the estimate all ready for extraction, would easily tide us over a year, in which time we could doubtless get overseas rubber again.

LOOKING AHEAD IN RUBBER.

PLANNING for the future of the rubber industry is something that manufacturers, engineers and skilled chemists are constantly doing. In the laboratories of the great rubber manufactories are men who think in rubber for years ahead. They foresee an ever increasing production of crude rubber which will make possible the fabrication of articles now undreamed of. It will after all be but history repeating itself.

The rubber fiber shoe soles came suddenly, but it was thought out long in advance of its début. Rubber chemists and manufacturers waited for low rubber and high leather. The market was finally ready for the fiber sole, as it will be one day for other new and revolutionary rubber products.

HEAVY SERVICE TIRES.

A BRANCH of automobile tire production which is destined to increase notably in the next year or two is the manufacture of heavy tires, particularly pneumatic, for use on what is known as "freight car trucks."

Where in the past the railroad did most of the "short haul" business, to-day the truck is taking it over quietly and efficiently. As fast as usable roads are built the truck does the freighting. Motor trucks are already widely used in transporting freight from town to town and from farmer to market, and it is to the interest of all shippers to promote this method of transportation as much as possible. The motor truck solved the freight congestion problem of the railroads during the winter months of 1917 and 1918 and they are already being called upon on a much larger scale for the coming winter.

Once motor roads parallel railroads, a general railroad strike would be an impossibility, for automobiles would care for the passengers, and trucks the freight. The tire manufacturers are helping toward such preparedness to a notable degree.

Three Hundred Million Pounds of Chrysil Rubber.

The long looked for report upon rubber-bearing shrubs in western America has appeared and it is no exaggeration to say that it is one of the most complete, scholarly and practical treatises of the day. It is mainly the work of Professors Harvey Monroe Hall and Thomas Harper Goodspeed of the University of California and is entitled "A Rubber Plant Survey of Western North America," preceded by a twelve-page reprint on ecology from the year book of the Carnegie Institution for 1918.

This covers study and experiment at desert and mountain stations and through expeditions. The specific work on rubber began in 1917 when a chemical laboratory was fitted up at the Alpine Laboratory at Pike's Peak to work in conjunction with a desert laboratory and the university laboratory at Berkeley, California. Here 18 genera and 30 species were examined chemically. These were largely latex plants. Rubber was found in 25 of the species examined, but in most it was too minute in quantity to be important. In 11 the percentage was enough to call for further work and in 4 it was high enough to warrant the hope that the species may serve for the production of rubber on a commercial scale.

The main report apart from the folder on ecology is divided into three parts:

(1.) The *Chrysothamnus nauseosus*, by Professor Hall.

(2.) Chrysil, a new rubber from *Chrysothamnus nauseosus*, by Professors Hall and Goodspeed.

(3.) The occurrence of rubber in certain West-American shrubs, by Professors Hall and Goodspeed.

In the first part, Professor Hall, after a brief general description of the *Chrysothamnus*, presents a key to the sections of *Chrysothamnus* which he assembles in five natural groups. Of these the *C. nauseosus* is the one he selects as containing rubber in sufficient quantity to be interesting. Next comes a key to the varieties of *C. nauseosus*, followed by a synopsis of the varieties. This latter is a complete botanical description of 22 varieties, with extended notes covering occurrence, habitat, etc. This part closes with a very valuable index of specific and varietal names. Part 2, relating to the product of the *C. nauseosus*, which is well named Chrysil rubber, will appeal to the rubber manufacturer, just as Part 1 appeals to the botanist.

Very wisely, at the beginning, 25 pounds of the shrub was sent to Dr. David Spence to get an idea of the value of the rubber. His report was that the rubber was of "high grade and average quality, not as good as the best fine Pará, but a great deal better than most Africans or low grade rubbers."

The *Chrysothamnus*, or "rabbit brush," is very widely distributed. The investigators found that "they range in altitude from about sea level in some of the desert basins to 8,000 feet in the southern Colorado mountains. Some varieties occur at even higher altitudes, but they have not been examined as to their rubber content. The plants are most abundant and of maximum size in the Great Basin area, becoming more and more scattered and apparently diminishing in their percentage of rubber as we pass from this center of distribution. The most northerly points from which we have taken samples for analysis are in eastern Oregon (Redmond, Burns, etc.), eastern Washington (Spokane), southern Idaho, and southern Wyoming (Rawlins, Laramie). The best samples carried only three per cent of rubber and most of them ran less than two per cent. The easterly limits of the genus are reached in South Dakota and western Nebraska; the southerly limits, in western Texas, southern New Mexico, and southern Arizona, with some possible extensions into Mexico, or at least into Lower California. On the Pacific Coast we find scattered groups of the plants as far west as the Coast Range mountains; for example, San Benito County, Mt. Hamilton, Lake County, Trinity County, etc."

A very interesting estimate of what may be expected as to extracted product is as follows:

Districts.	Pounds.
No. 1—East Central California and adjacent Nevada	3,[illegible],000
No. 2—Mojave desert California	400,000
No. 3—Northeastern California and adjacent Nevada and Oregon	1,000,000
No. 4—West Central Nevada	7,680,000
No. 5—Northern and Central Nevada	23,700,000
No. 6—Utah	20,000,000
No. 7—Colorado	21,300,000

VIEW OF BENTON HILLS, CALIFORNIA, WHERE ONE OF THE EXPERIMENTAL TRACTS OF CHRYSOTHAMNUS WAS LOCATED. HAPLOPAPPUS WAS ALSO FOUND AMONG THE ROCKS MIDWAY UP THE HILLS.

In addition to this there are numerous other extensive and unexplored regions where large amounts of rubber-bearing shrubs can be found. The most promising of these is Wyoming, and there are also considerable areas in southern Montana, in Idaho and in eastern Washington. This total of approximately 80,000,000 pounds can be increased by 50 per cent by allowing for other districts in these regions which were not explored, and that with the other regions mentioned would bring the total well up to 300,000,000 pounds.

It should be noted by the way that the *Chrysothamnus* is not a latex producing plant. The rubber is found in the individual cells of the shrub, as in guayule. Like guayule also it is found principally in the parenchymatous elements of the cortex. It may also be noted that rubber does not appear to be laid down during the first year of growth of a tissue, and, indeed, unless present in large amount, is not readily detected by the histological method in portions of the plant less than three or four years old.

Shrubs of interest as possible rubber producers are usually of good size, measuring three to eight feet high and about as broad. The rubber is present for the most part in the inner bark of the stems, and those portions in average mature plants will weigh from five to fifteen pounds. An exceptionally large plant found near Lone Pine, California, weighed 60 pounds exclusive of the twigs, and shrubs weighing 20 to 40 pounds are not rare. This is partly because the plants reach the maximum size only under favorable conditions and partly because they are frequently burned or cut off near the base, after which new stems shoot up only to be again destroyed before reaching maturity.

Another shrub that is treated at length is the *Haplopappus*, which contains considerable more rubber than the *Chrysothamnus*, from 6 to 10 per cent. The product is, however, soft and resinous.

A brief, even of the briefest, of the many lines of investigation, the chemical analyses and the microscopical examinations, is out of the question here, so comprehensive is the work.

In conclusion it is to be hoped that the work will be carried farther and that the cultural possibilities of these interesting shrubs will be fully investigated and at an early date.

PEACE PROBLEMS AND PROGRESS.

INTERNATIONAL TRADE CONFERENCE.

The International Trade Conference held in October at Atlantic City, New Jersey, and the subsequent tour of the foreign delegates to the principal industrial centers of the United States has accomplished much toward the desired restoration of world commerce, and it is believed that a program may now be framed which will help Europe to regain her feet commercially and industrially.

America now knows the needs of her allies in raw materials, food and machinery, and the action taken at Atlantic City indicates that their needs will be met. America also appreciates more fully that American prosperity is bound up in European prosperity, for Europe cannot pay even the interest on the debt she owes us unless she can be restored to production. The whole matter resolves itself into a business proposition of enormous proportions to be handled in a business way, with credit as the base.

A permanent organization was formed to make effective the purpose of the conference. An international meeting will be held in 1920, after which the gatherings will be biennial. Approval was given to the Edge Bill, recently passed, authorizing financial assistance in Europe, and also to effective investments in foreign credits against which debentures of American companies may be issued.

England asks only for an opportunity to purchase in America certain commodities for which she can pay. Belgium, which is recovering rapidly from the war, asks for credit to enable her to buy here. France and Italy have the most pressing needs, and their request is for long time loans.

GOODRICH TRAVEL AND TRANSPORT BUREAU.

Prompted by a growing demand for highway information and charts from highway transportation engineers and advocates, the National Touring Bureau of The B. F. Goodrich Rubber Co. announces that its scope of operation will be broadened to include the dissemination and distribution of all highway transport data.

Henceforth it will be known as the Goodrich Travel and Transport Bureau. Through its country-wide organization of branches, depots and dealers the bureau has distributed upwards of 150,000,000 pieces of touring information to the motoring public. During 1919 it distributed nearly 5,000,000 state highway maps.

Raymond Beck, who acted as field engineer of the United States Highways Transport Committee during the war, has been chief of the bureau since its inception in 1911.

A campaign has been inaugurated by the bureau to make American highways 100 per cent efficient by keeping them open this winter.

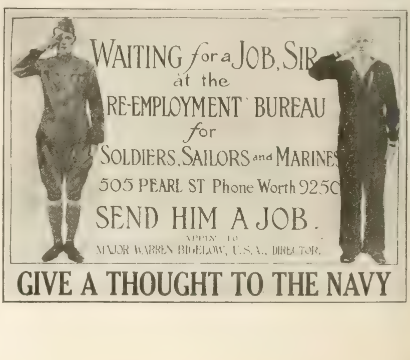
A booklet has been prepared on the subject that will be distributed to state and county highway engineers and commissioners. It shows that the snow problem can be solved in two ways or by a combination of both, consisting of drift prevention measures and snow removal methods.

TIRE BUSINESS TO EXCEED A BILLION DOLLARS IN 1920.

G. W. Yeoman, treasurer of the Continental Motors Corp., Detroit, Michigan, and a director of the Motor and Accessory Manufacturers' Association believes it is likely that the production of passenger automobiles for 1920 will be near the 2,000,000 mark, while the output of commercial motor vehicles will be about 300,000. He also asserts that there will be nearly 8,000,000 power driven vehicles, including both passenger and commercial cars, in actual use by the dawn of the new year.

This estimate approximately coincides with the deductions of others in a position to know, and from it the probable tire demand for the year can be readily computed.

With 8,000,000 motor cars in operation, some 40,000,000 tires will be in use and will be required annually. To these must be added 8,000,000 tires required for the original equipment of 2,000,000 new cars and 2,000,000 more which will be needed for spares within the year. The 300,000 new trucks will require 1,200,000 tires for original equipment and 300,000 more for spares. All told it appears that the 1920 tire demand may reach 51,500,000 tires valued at some $1,287,500,000.



Making Arctics by Machinery.

After several years of experimenting a process of making cloth arctics by machinery after the manner of manufacturing leather shoes, has been perfected. The advantages of the machine over the hand method are a lower production cost per pair, sturdier and more nearly standard shoes, less waste and greater output, all of which have been so satisfactorily demonstrated that rubber shoe factories are beginning to change over to the machine method.

In order that the difference between hand and machine manufacture may be clearly brought out, the time-honored hand system is briefly described.

THE HAND METHOD.

A prevailing type of one-buckle arctic consists of twenty parts: the insole, rag sole, filler, outsole, heel lift, lining (usually of wool or fleece) joining strip or piping, toe cap, rag heel, cloth heel, foxing, gum inner vamp, friction inner vamp, quarter and vamp facing, heel strip, back stay, quarter stay, cord buckle strap and buckles. A team of three men is the usual complement for making this shoe although individual makers frequently construct the arctic from start to finish.

All of the inside pieces, such as the insole, rag sole, etc., are coated with cement, the wool linings are joined at the seams with ¼-inch piping, the quarter is edged with cord and the buckles put on by girls in the make-ready department or stock cage for the team workers; individual makers prepare their own work.

At the start of the operation the first maker "lasts over" the lining to the insole, applies the heel lift, friction toe foxing, rag filler and gum inner vamp. The shoe then passes to maker number two, who completes the construction of the upper by

Preparing the Upper and Molding the Outsole.

Right to left: The girl is rolling the foxing on the assembled upper. Machines on the bench are Singer sewing machine, cementing machine for the edges of the upper, "stitcher" for the foxing, and a second cementing machine. On the [illegible] assembled tops ready for lasting. Machine at the [illegible] molding the insole to the shape of the last

putting on the rag heel, cloth heel, and the facings, which are applied separately, it will be noted, and joined at the sides.

Maker number three finishes the shoe by "stitching" (a term used for running a serrated roller around the edges of the foxing and outsole to bind them together) the foxing, putting on the gum toe cap, and rolling on the outsole. After the shoes are vulcanized, they are stripped from the lasts in the packing room and the surplus lining trimmed off.

THE MACHINE METHOD.

The first difference in the machine method which has been developed by the United Shoe Machinery Co. is that the upper instead of being built on the last, piece by piece, is made up complete before lasting, the same as the upper of a leather or tennis shoe. Thus the top is completely fitted to the last.

The construction of the upper is similar except that the linings follow the same lines as the facings and are made to fit exactly, thus avoiding the waste of trimming after vulcanization. The gum foxings are placed on the upper before lasting as follows: the heel foxing is placed on the quarter and rolled by machine; the quarter is then stitched to the vamp on a Singer sewing machine, after which the toe foxing is applied so

Assembling and Lasting.

Right to left: The man is tacking the insole to the last. Next is the machine which assembles the upper and insole at the heel. Directly in front are two consolidated hand lasting machines or "niggerheads" which nail the upper to the insole In the rear is a "pulling over" machine, which lasts over the forepart of the upper Shoes in the foreground are lasted and ready for the "pounder"

that it overlaps the heel foxing at the sides. The edges of the top are cemented by machine in one operation, and it is ready for lasting.

An insole of fiber board or composition material is generally used, although the ordinary sole of "rag" and cloth answers the purpose, provided the rag is compounded with plenty of fibrous material to make it stiff. A rag filler smaller than the insole is cemented to it by an insole cementing machine and molded to the shape of the last on a molding machine similar to that used to mold outsoles of leather shoes.

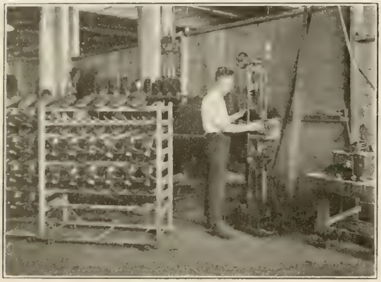
Wooden lasts bottomed with a sheet of metal perforated with holes at the ball, shank and heel are used, but any style of wooden or metal last can be adapted to the method. A tacking machine fastens the insole to the last by inserting a tack in each of the three holes for temporary purposes. The insole and the upper are then assembled on an assembling machine, which tacks the upper to the last at a point just above the heel foxing and lasts over the heel. Thus the upper is held firmly in place on the last, and the large lining of the hand-made arctic becomes unnecessary. The small tack hole just above the foxing in no way impairs the waterproof qualities of the shoe, as it closes during vulcanization.

The shoe then passes to the "pulling over" machine, which pulls or lasts over the upper at the forepart after which the hand-method lasting machine or "niggerhead" fastens the upper securely to the insole by inserting a line of tacks about ¼-inch from the edge. The upper has previously been cementd along the edge, so the machine arctic is both nailed and cemented. The thickness of the upper corresponds to the gage of the filler, consequently the bottom of the shoe is smooth. Even the most experienced hand lasters cannot always avoid the bunches and

lumps at the toe and heel. A machine known as a "pounder" finishes off the bottom, buffing away the rough edges and removing the three tacks which hold the insole to the last. A different type of cementing machine cements the bottom, and the shoes are dried on racks before the outsole is applied.

The outsole is put on by a recently invented sole-laying machine. By working a foot lever a cushion consisting of layers of vulcanized rubber presses the sole on the shoe after the manner of a vise. The cushion of rubber applies uniform, direct pressure to the entire surface of the sole and envelopes it so that it can be used for rolled and semi-rolled edge outsoles. A machine "stitcher" finishes off the job, and the shoe is ready to be vulcanized.

Manufacturers have found that the yield of "seconds" from machine-made arctics is much lower than from the hand-made product. Uniform pressure of machine rolling on the foxings and outsole is responsible for this, as blistering owing to light



LAYING THE OUTSOLE.

The man is applying the outsole on a sole laying machine. At the right is the machine for cementing the insole. Shoes on the rack are ready to be outsoled.

rolling has been eliminated. The two, four and six-buckle arctics involve no new problems of manufacture, the only difference being in the construction of the upper. The same lasts are used with an ankle piece fastened on.

This is the first process in the history of the rubber shoe business by which arctics have been made by machinery. It will be interesting to watch further developments in this field, for the introduction of machinery will undoubtedly make for standardization and increased production in rubber shoes of all varieties.

NUMBER OF EMPLOYES, TOTAL PRODUCTION AND CRUDE RUBBER CONSUMED IN THE RUBBER INDUSTRY 1917-1918.

The request of The Rubber Association of America for information was answered this year by only 103 out of 452 manufacturers, but these represented 73 per cent of the rubber output in 1917; the same percentage is therefore employed in estimating the totals for 1918. The number of employes reported by the minority was 151,078 in 1917 and 148,787 in 1918 a diminution of 3,896 or 1.88 per cent. Applying this percentage to the total number reported in 1917 gives 203,818 as the total number of employes in 1918.

The 103 manufacturers sold $819,159,105 worth of goods as compared with $654,948,376 in 1917, an increase of 26.4 per cent. Applying the same method to the computation of the total sales we obtain $1,122,135,760 as the estimate for 1918 compared with the $895,816,248 reported for 1917. It may be noted that the product of the 103 in 1918 is very nearly equal to the total product of 1917.

The total amount of crude rubber used in 1918, 322,606,605 pounds, was only a little over 5 per cent more than the 306,113,652 pounds consumed in 1917. About an eighth less rubber was used for casings under 6 inches, 140,021,023 pounds instead of 162,643,482 pounds in 1917, while the quantity put into solid tires doubled, 50,024,166 pounds instead of 25,055,673 pounds in 1917, while that employed for other tires and tire sundries increased by two-fifths, 14,221,023 pounds as compared with 9,983,195.

While the total amount of rubber used for tires increased slightly, 237,168,347 pounds in 1918 and 233,386,796 pounds in 1917, the quantity used for other rubber goods was greater relatively, so that the proportion of rubber for tires was a shade under three-fourths of the total in 1918 instead of a little above as in 1917. The increase in boots and shoes was about a sixth, 31,468,843 pounds; that in mechanical goods very slight, 22,101,528 pounds and that in other products almost a third, 31,897,887 pounds.

BRITISH COTTON TRADE DEALS.

With regard to the recent cotton trade deals, it is of interest to note the connection of some of the moving spirits with the rubber industry. It is well known that the Dunlop Rubber Co., Limited, has its own spinning and weaving mills in Lancashire, so it is not altogether surprising that it is closely concerned with the Amalgamated Cotton Trust which was formed in October, 1918, to acquire certain mills. The first report of this company, issued in November, showed a profit of £114,416. This trust owns twenty mills and is linked up through one or another of its directors with the Dunlop Rubber Co., Limited, the Tyre Investment Trust and the Austin Motor Co.

A. L. Ormrod, who is on the board's financial advisory committee, is chairman of the Dunlop Rubber Co., Limited, and W. T. Glover & Co., Limited, and a director of the Tyre Investment Trust, while Wilfrid Dawson, also on the committee, is a director of the Dunlop company and of the Tyre Investment Trust. Harvey du Cros, a director of the Amalgamated Cotton Trust, is director of the Austin Motor Co., while another director, S. W. Copley, is the owner of a small rubber works among his various other and more important interests. That South African mining and finance are in the cotton mill transfer is seen by the names of A. R. Stephenson, manager of Barnato Brothers, and S. B. Joel.

It is obvious that the sellers of the concern recognize that increased capital is necessary in order to finance the business at the present high price of materials and that building extension will cost far more in the future than in the past.

REACTIONS OF ACCELERATORS DURING VULCANIZATION.[1]

By C. W. Bedford and Winfield Scott.

THE HIGHEST POWERED ORGANIC ACCELERATORS known to-day are the carbon bisulphide reaction products of strong organic bases. Perhaps the best example is the piperidine salt of piperidyl-dithiocarbamic acid.

Due to the strong basic nature of piperidine, this salt is stable and may be isolated as such. Strong aliphatic bases such as dimethylamine also give stable dithiocarbamates which are very powerful accelerators.

Thiocarbanilide, which is perhaps the most widely used commercial accelerator, is formed by the same mechanism of reaction, there first being formed the aniline salt of phenyl-dithiocarbamic acid.

This aniline salt is extremely unstable due to the weak basic properties of aniline and cannot be isolated as such. The ammonium salt of this phenyl-dithiocarbamic acid may be isolated

[1]Published by courtesy of the American Chemical Society. Paper read before the Rubber Division of the American Chemical Society, Philadelphia, Pennsylvania, September 2 to 6, 1919.

but decomposes on standing. The metallic salts of dithiocarbamic acids are much more stable according to Krulla.[2]

The aniline salt, by loss of hydrogen sulphide, produces thiocarbanilide.

The stable dithocarbamates above mentioned lose hydrogen sulphide in a similar manner when heated to the temperatures used in the vulcanization of rubber and produce thiourea derivatives. It is, therefore, quite possible that they may function as curing agents in the same manner as thiocarbanilide.

André Dubosc[3] has stated that thiourea derivatives can "furnish in a colloidal state all the sulphur necessary for vulcanization." In checking up this statement it appeared at first that Dubosc was correct, but the cures obtained were soon shown to be due to free sulphur present as an impurity in the accelerator used. Pure thiocarbanilide and pure dithiocarbamates do not vulcanize rubber in the absence of free sulphur either in a pure gum or high zinc oxide stock. We, therefore, are unable to agree with this investigator that the sulphur of such compounds is available for vulcanization.

There are some dithiocarbamates which liberates the free base by a heat decomposition, such, for example, as the liberation of dimethylamine by heating its carbon disulphide reaction product. Since these free bases are evidently good curing agents, it is possible that they may function as accelerators after being liberated by a heat decomposition of the dithiocarbamates. It is, however, not the object of this paper to discuss the mechanism of the action of thiourea derivatives as accelerators. What we wish to show is that there are many accelerators not ordinarily, classed with thiocarbanilide but which undoubtedly produce thiourea derivatives by reason with sulphur during the vulcanization process, so that they may be classed as being similar to thiocarbanilide in their ultimate action.

In June, 1913, J. Bastide was granted a patent[4] wherein he claimed methylene and ethylene compounds of aliphatic and aromatic amines as vulcanization accelerators. As specific examples he mentions methylene-diphenyl-diamine and phenyl-imino-methane, the latter being otherwise known as anhydro-formaldehyde-aniline or methylene-aniline. These two accelerators easily react with sulphur to form thiourea derivatives.

Methylene-aniline easily polymerizes to the di-, tri-, and probably higher polymers. We have found it convenient to consider it as the dipolymer and to take 210 as the molecular weight. It has been found that 210 grams of methylene-aniline will react with four atomic weights of sulphur, whereby one molecular weight of carbon bisulphide and one molecular weight of hydrogen sulphide are lost and that about 95 per cent of the product is thiocarbanilide.

This reaction starts at about 130 degrees C. and proceeds best at 150 degrees C. The amount of carbon bisulphide liberated may be determined by condensing as much as possible and weighing. Any uncondensed carbon bisulphide vapors may be caught in aniline wash bottles which have previously been saturated with hydrogen sulphide. The amount of hydrogen sulphide may be determined by absorption in caustic. A small amount of aniline and other products are formed by side reactions.

It is quite probable from the above data that methylene-aniline, when compounded as such, will generate carbon bisulphide during the cure. In the presence of basic amido compounds this carbon bisulphide should at once generate dithiocarbamates, similar to those which have been shown by Ostromislensky to have such high curing power. The curing power of methylene-aniline may, therefore, be due in part to the formation of dithiocarbamates formed from carbon bisulphide liberated slowly in the cure and a subsequent reaction with amido compounds which may be present, but its chief curing power is evidently due to the direct formation of thiocarbanilide. It must not be assumed, however, that methylene-aniline should therefore have as strong a curing power as thiocarbanilide. That this is not the case is undoubtedly due to the lag of the sulphur reaction during the cure.

[2]"*Chemische Berichten*," volume 46, page 2669

[3]"The India Rubber World," February 1, 1919.

[4]French Patent No. 470,883.

Methylene-diphenyl-diamine produces several reaction products when heated with sulphur, the reaction proceeding easily at 140 degrees—150 degrees C.

(*a*) A certain amount of the thiocarbanilide is formed, but the yield is comparatively low.

(*b*) Methylene-diphenyl-diamine by heat alone loses aniline, probably by a semidine reaction with itself.

This reaction may be continued until the condensation has proceeded so far that one mole of the original compound has lost one mole of aniline. By reaction with sulphur before compounding and removal of such free aniline as may be formed, there is produced an accelerator of much greater curing power than the original material and which shows curing properties very similar to those of thiocarbanilide. One of the constituents of this reaction is apparently a sulphur reaction product. Another very closely resembles thiocarbanilide and is probably one of the reaction products which is formed from methylene-diphenyl-diamine when this compound is used as an accelerator for the vulcanization of rubber.

(*c*) Methylene-diphenyl-diamine in the presence of aniline, either added as such or formed by reaction (*b*), undergoes a semidine transformation with the aniline at temperatures even lower than milling temperatures. Paramido-benzyl-aniline is a liquid which is crystallizable with difficulty and forms so easily from the other reaction product that there is no difference in the curing power of the two compounds. Paramido-benzyl-aniline reacts easily with sulphur to produce para-amido-thiobenzanilide.

The latter is another compound very similar to thiocarbanilide, to which may be attributed a portion of the curing power of the original accelerator.

The main reaction of this type of methylene accelerators is evidently to substitute thiocarbonyl groups for methylene groups. This produces compounds very similar to thiocarbanilide and which may be considered as being derived from thiocarbanilide by similar condensation and semidine reactions, although we have been unable to prepare them directly from thiocarbanilide.

In the interaction of hexamethylene-tetramine with sulphur during the cure, we have another possibility of the formation of carbon bisulphide reaction products with amines. Hexamethylene-tetramine reacts very readily with sulphur at curing temperatures, producing a multitude of products including hydrogen sulphide, ammonia and carbon bisulphide in large amounts. Dubosc[5] has described the sulphur reaction products of hexamethylene-tetramine, but for some unaccountable reason has absolutely overlooked two of the main reaction products, ammonia and carbon bisulphide. The accelerating action of hexamethylene-tetramine may therefore be explained by the interaction of this ammonia and carbon bisulphid to form a dithiocarbamate. This allows us to classify hexamethylene-tetramine as a thiourea accelerator.

With a large majority of accelerators there is no possibility of the formation of thiourea derivatives by a reaction with sulphur. As far as is known, all accelerators containing methylene groups, similar to those described, react easily with sulphur at curing temperatures to produce thiourea derivatives. This does not include, however, the methylene groups of such compounds as piperdine, or penta-methylene-diamine which on heating loses ammonia and forms piperidine.

SUMMARY.

1.—Organic accelerators containing methylene groups, similar to those described, readily react with sulphur to produce thiourea derivatives.

2.—These sulphur reactions take place at curing temperatures and may throw some light on the mechanism of the reactions of these accelerators during vulcanization.

[5]Locus citatus.

Volume Increase of Compounded Rubber Under Strain.[1]

By H. F. Schippel.

THE FIRST RECORD of this interesting phenomenon of volume increase in rubber under strain dates back as far as 1884, when Joule recorded the fact that the specific gravity of rubber decreased upon stretching it. His test results stated a change of specific gravity of 0.15 per cent for a 100 per cent stretch. This is a very small increase, and therefore his experiments were made upon comparatively pure rubber, unmixed with pigments, as the present paper will show.

In 1889, Mallock made tests upon pigmented rubbers of different kinds, but he made the volume elasticity tests upon the samples only by applying pressure to the water in which he immersed them, thereby simply corroborating the results of the previous investigator.

Again, in 1890, Sir William Thomson stated that a column of rubber when stretched out suffers no sensible change in volume, and that the contraction of any transverse diameter must be sensibly equal to one-half of the longitudinal extension, and rubber may therefore be regarded as an incompressible elastic solid. This also is true of pure rubber.

While studying the nature of the stress-strain curves for rubber containing different pigments in varying quantities, the writer considered the stability of the rubber surrounding each particle of pigment in the rubber body, and thought that possibly when the rubber body was elongated sufficiently, the rubber might pull away from the particles of pigment in their axes of stress, and cause vacua to be formed on both sides of each particle, the net result of which should be a considerable increase in the volume of the rubber body as a whole.

A preliminary test was made by preparing a transparent vulcanized compound containing a fair proportion of medium-sized lead shot. When this compound was stretched, the formation of vacua proceeded gradually until each lead shot had its conical vacua on both sides in the direction of strain. This was very satisfactory, and the test was immediately applied to miscellaneous samples of rubber compounds, with the result that this integral phenomenon was actually found to take place. It was more noticeable in the red rubber than in the white. Also, after keeping the samples under tension for some time, and then releasing, temporary increase of volume was noted, which was due to sub-permanent set, or the diffusion of gases into the vacua, or both. In certain cases, the observed volume increases under simple strain were very remarkable. For example, a specimen made up of 100 grams of fine Pará, 30 grams of litharge, 5 grams of sulphur, and 337 grams of whiting, and press cured for 30 minutes at 40 pounds' steam pressure, gave a volume increase of 52 per cent at an elongation of 140 per cent, while the estimated volume increase for a similar compound containing 215 grams of barytes in place of the whiting was 120 per cent at the breaking point. In the former case, the average value of Poisson's ratio up to the breaking point was 0.39 and in the latter case 0.31. These values are not at all abnormal, but their cumulative effect in a substance which has the ability to withstand comparatively enormous elastic strains is worthy of serious consideration from a physical standpoint.

For smaller percentages by volume of barytes, the volume increase was found to be less at the breaking point, and similarly for larger volume percentages, due in the latter case to the formation of local contractions similar to that of metals.

It was also noted that when barytes was substituted by an equal volume of lampblack, the volume increases for any given elongation were smaller.

Systematic tests were accordingly made upon a series of compounds containing in various volume percentages one of the following pigments in each case: barytes, whiting, zinc oxide, china clay, red oxide, lampblack, and carbon black. The curves shown give graphically the results obtained.

The common base was made up of 100 parts by weight of fine Pará, 5 parts sulphur and 30 parts litharge, the weight of the test pigment added in any case being the volume index for that case multiplied by the specific gravity of the pigment.

A blank test was made by stretching the base only without any other pigment content. The curve obtained is marked "O" on each series of curves for the pigments.

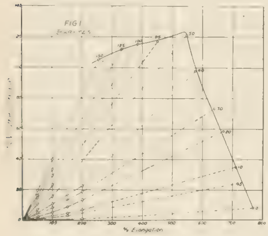


FIG. 1.

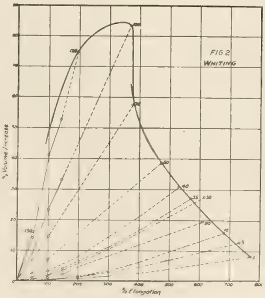


FIG. 2.

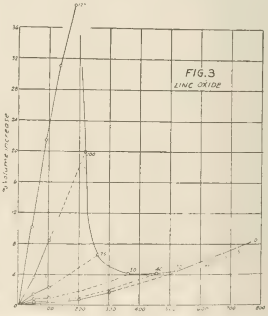


FIG. 3.

METHOD OF PROCEDURE.

Test rings, having a cross-sectional diameter of ½ inch, and an outside diameter of 2¼ inches, were made from each compound up to about 35 volumes content. For volumes above this, the compounds were too stiff to make a perfect fit in the ring mold, and flat slabs about 100 mils. thick were made, from which flat rings were cut. The internal circumference of the rings was approximately four inches. Each ring was stretched consecutively over each of a graduated series of steel bars from three to eight inches long, or as far as the ultimate stretch of the rubber would allow, and the volume increase was calculated by

[1]Published by courtesy of the American Chemical Society. Paper read before the Rubber Division of the American Chemical Society, at Philadelphia, Pennsylvania, September 4, 1919.

determining the change of specific gravity. This method, which avoided the construction of any special apparatus, and was very accurate, was the suggestion of Mr. W. B. Wiegand, whose inspiring cooperation in this and other rubber researches the writer takes pleasure in acknowledging.

(1) Barytes: The test results are shown by that part of each curve in full line. It was found impossible to obtain higher elongations than 200 per cent for the large rings, owing to their failure by slow tearing when stretched above this value. The curves approximate closely to straight lines, showing that the volume increase varies almost directly with the elongation. Also for a constant elongation, the volume increases progresses with the percentage of barytes in a roughly proportionate manner. There appears to be no adhesion whatever (or very little) between the rubber and the particles of barytes, because there is a volume increase in the compound containing only five volumes of barytes. The particles are certainly not crowded in a five per cent mix, and their surfaces do not necessarily transmit the whole local stress, but on account of this early separation of the pigment particles from the rubber, the particles take no important part in the stress-strain curve for the body, since the stress is transmitted through the rubber only.

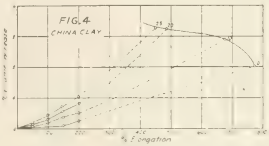


Fig. 4.

It was thought that possibly the large volume increases might be due to the pigment entering the rubber in agglomerated masses, and that most of the increase in volume might be due to the ready separation from one another of particles which were in dry contact. Accordingly, two tests were made to determine this, one test of a sample of compound milled for 60 minutes instead of 21 minutes for the normal mix, and another test upon a sample which was softened to cement consistency in gasoline, thoroughly mixed, dried, and press-cured as usual. The excessively milled sample showed a very slight increase of percentage volume increase, but the decrease of this property in the cement sample was more considerable. The entry of the gasoline into the compound presumably softened the rubber and allowed it to flow around each particle, wetting the whole mass of pigment thoroughly; so that, although part of the volume increase under stretch is due to the separation of pigment surfaces in dry contact, the larger part of the increase is due to rubber separation from the surface of the particles.

The curves were extended as shown by the dotted lines to the point corresponding to the ultimate percentage elongation as obtained from standard breaking tests on a tensile testing machine. The full-line curve joining these points is of special interest. The discontinuity above 50 volumes is due to the formation of local contractions in the test ring, so that the whole body of rubber does not receive the same proportional elongation. The neck is similar to that formed on metal specimens. By mechanically working the rubber rings until the stiffness is removed, greater volume increases are obtained, *i. e.*, we obtain points on the true extension of these curves. In the same way higher elongations could be obtained on the tensile testing machine.

(2) Whiting. The curves for this series of compounds show that up to 40 volumes of whiting, the percentage increase is comparatively small, then there is a sudden jump in volume increase with further addition of pigments, until at 150 volumes the whiting gives results almost equal to those with barytes. This probably is due to agglomeration of the pigment particles when present in large amounts. It should be noted that these curves are plotted on a more open scale of per cent volume increase than that of the barytes.

(3) Zinc Oxide.—The trend of the zinc oxide curves up to 30 volumes is identical with that of the basic mix, although the ultimate elongation is reduced as much as 250 per cent. This shows that there is a strong adhesion of the rubber to the particles of zinc oxide, which imparts additional strength to the basic mix, but which reduces the ultimate elongation on account of the dilution of the rubber. This phenomenon classifies zinc oxide physically with the finer pigments, lampblack and carbon black. The upward shift of the curves for volumes above 30 indicate a rapid growth of agglomerated masses of particles which greatly reduce the tensile strength of these compounds. The shape of the almost complete 125-volume curve indicates that the large extrapolations of the other curves are approximately correct.

(4) China Clay.—The range of volumes experimented upon is not so large, but there is indicated an increase in volume for the low percentages of pigment. The open scale of "volume increase" to which these curves are plotted should be noted. The trend of these low volume curves away from the basic mix curves shows that the addition of china clay to rubber lowers the tensile effect upon the compound.

(5) Red Oxide.—The red oxide, being a finer pigment than china clay, shows less volume increase under strain. Also, departure from the curve of the basic mix shows a weakening effect upon the compound.

(6) Lampblack.—The volume increase of the lampblack compounds is graduated proportionally to the content of lampblack up to 50 volumes. The 75-volume compound shows a considerable rise of volume increase, which indicates a rapidly increasing agglomeration of the particles. This means that the limit of ability of the rubber to wet each particle of lampblack has been reached at 50 volumes, and above this volume the rubber surrounds groups of particles instead of embedding each particle individually.

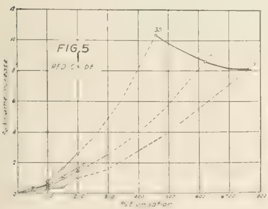


Fig. 5.

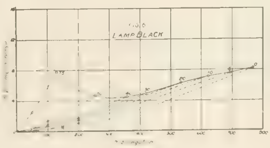


Fig. 6.

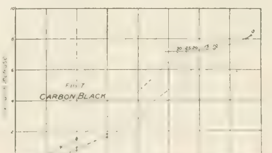


Fig. 7.

(7) Carbon Black.—A 30-volume content of carbon black lowers the ultimate elongation of the rubber to 530 per cent, while the same volume of lampblack lowers it to 420 per cent. This indicates a greater weakening effect of the lampblack on the rubber, although the volume increase under equal strain is less.

Curves for 50 Per Cent and 100 Per Cent Strength.—Figs. 8 and 9 show the property of volume increase in a different light. Here the variation of percentage volume increases is shown on

a "volume of pigment" base for constant elongations of 50 per cent and 100 per cent. These curves are really a more distinct representation of the growth of agglomerated masses of pigment as the volume of pigment is increased. It will be noticed that at 100 per cent strength the whiting and zinc oxide curves tend to approach the barytes curve, due to the more rapid formation of agglomerated masses of these pigments than that of the barytes. Since the average particle of whiting has only one-eighth the volume of the average particle of barytes, it would require an agglomeration of the whole body of whiting into average groups of eight particles each to cause the whiting curve to meet the barytes curve, or multiples of eight, if there already existed an agglomeration of the barytes particles. This agglomeration of the pigment particles and the phenomena connected with it are of vital importance, since the sudden growth of agglomerated particles at certain volumes may be coincident with a rapid increase of hysteresis, due to the friction when the rubber body is distorted, amongst those particles which are in dry contact with each other. Conversely, any means of reducing the agglomeration of pigment should also be the means of reducing the hysteresis, such as the method of milling, and the use of solvents to reduce the viscosity of the rubber while mixing in the pigment.

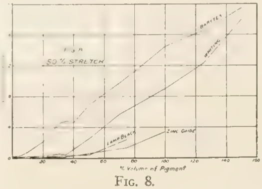


FIG. 8.

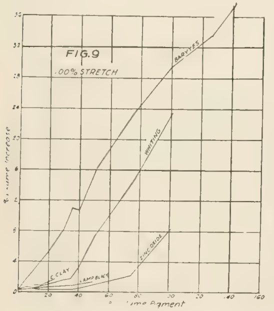


FIG. 9.

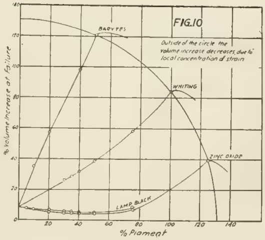


FIG. 10.

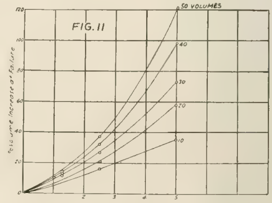


FIG. 11.

Fig. 10 shows the percentage volume increase at failure on a base of percentage pigment, plotted up to the point of maximum volume increase, which takes place, as mentioned before, when local contraction of area occurs. These maximum points, as shown for the three pigments barytes, whiting, and zinc oxide, lie approximately on a circle having the origin as center. The lampblack curve cannot be extended sufficiently far to reach the maximum volume increase due to the inability of the rubber to absorb large quantities of lampblack. The curves for china clay, red oxide, and carbon black are not shown, but as far as they have obtained, the fall between whiting and zinc oxide, the china clay lying highest and the carbon black lowest of the three.

Fig. 11 undoubtedly shows the real explanation of the variability of the pigments from the volume increase standpoint. They show that, with the exception of zinc oxide, the greater the mean diameter of the pigment particles, the greater is the volume increase under strain. A confirmation of this statement was the result of a test on four samples of barytes compounds, containing equal volumes of barytes of different degrees of fineness. The different grades were prepared by allutriation in water. The compound containing the finest grade of barytes showed the least volume increase under strain. This was a critical test which eliminated every other variable but the size of the pigment.

A NEW FIELD FOR RUBBER CULTURE.

Papua or British New Guinea is entering the plantation rubber field in earnest. One company has nearly 2000 acres with 152,000 trees, over 50,000 of which are tappable; it produced 89,938 pounds of rubber in 1918 as compared with 54,303 pounds in 1917. Another company has 920 acres planted with *Hevea*. With the rise in the price of rubber, or if Australia will establish preferential trade conditions, the Papuan rubber may compete in Australia with that from Singapore.

NEW ZEALAND TIRE IMPORTS.

The value of New Zealand's tire imports for 1916 was £639,719, for 1917 £453,893, for 1918 £702,026, and for the first four months of 1919 £334,472.

The following tabulation shows the total value of motor car tires imported at each port in New Zealand and the country of shipments and origin during the month of May, 1919:

From	Origin of Shipment	Auckland.	Wellington.	Lyttelton.	Dunedin.	Other Ports.	Totals.
United Kingdom	U. K.	£35	£1,874	£6,489	£23	£1,254	£9,675
United Kingdom	France	......	......	18,185	......	......	18,185
Canada, via East Coast	Canada	1,239	1,022	......	......	1,430	3,691
Canada, via West Coast	Canada	2,032	2,785	......	1,409	......	6,226
Canada, via West Coast	U. K.	53	......	......	......	......	53
Australia	Australia	7,662	6,482	10,843	......	......	24,987
Australia	U. K.	54	31	......	......	......	85
Australia	France	......	481	......	......	......	481
Australia	U. S. A.	396	......	12	......	......	408
France	France	......	......	13,959	......	......	13,959
United States, via East Coast	U. S. A.	1,538	7,618	9,167	322	410	19,061
United States, via West Coast	U. S. A.	516	18,468	1.668	193	......	20,845
Totals	....	£13.525	£38,761	£60.323	£1,947	£3,100	£117,656

U. S. Army Methods of Procuring and Salvaging Rubber Articles

By John J. Cameron.

The tremendous demands of the Army during the war for articles of rubber, numbering thousands of separate items, were met, because the Army took practically the entire capacity of all the mills in the United States, because at all times the manufacturers of rubber goods gave the Government their best services and did all in their power to meet the heavy demands made upon them, and because of the great savings made in salvaging articles containing rubber.

ARTICLES PURCHASED BY CLOTHING AND EQUIPAGE DIVISION.

The chief purchases of rubber goods made during the war by the Clothing and Equipage Division, Office of the Quartermaster General, Director of Purchase and Storage, which is charged with furnishing all the clothing for the Army, were:

Article.	Purchases. Apr. 1, 1917-Nov.11,1918.	Deliveries. Apr 1,1917-Dec.17,1919.
Rubber boots, hip . . . . *pairs*	3,644,280	2,885,082
Rubber boots, knee . . . . *pairs*	562,163	521,663
Overshoes, arctic . . . . *pairs*	3,222,160	3,222,160
Raincoats, foot (including slickers and ponchos)	8,783,074	8,255,950
Raincoats, mounted	100,000	96,996
Oilskin coats	1,652,532	734,068
Oilskin hats	1,703,170	954,252
Oilskin trousers	1,646,822	728,448

The difference in purchases and deliveries are accounted for by contracts cancelled or in the process of cancellation.

The reasons for these enormous purchases are largely accounted for by the fact that the consumption in action is three or four times that of the peace rate. The rule generally followed in supplying clothing was that there should be for each man at the front a three months' reserve in France, another two or three months' reserve in the United States, and another three months' supply in transit.

(Signal Corps, A. E. F., U. S. Army.)

Rubber Repair Department of the Salvage Depot, St. Pierre-des-Corps, France. Here All Rubber Goods Are Repaired. The Men in the Background Are Repairing and Vulcanizing Rubber Boots.

In supplying articles of rubber, which are matters of common commercial production, however, the problem was not as difficult as compared with the making of gas masks, an article not before manufactured. But the large needs of initial equipment did put an enormous strain on the industries turning out rubber goods. Of the different types of rubber boots purchased by the Clothing Equipage Division, there were more than 4,000,000 pairs, costing more than $20,500,000, one-half of which were purchased by the Clothing and Equipage Division since January, 1918.

Supplying our soldiers with raincoats was a difficult problem. As there was not a sufficient capacity in this country to meet the requirements, practically all stocks of commercial raincoats were purchased on the assumption that even a poor cover was better than none. In October, 1918, for instance, when the influenza epidemic was prevalent in the West, it was found that there was a great shortage of raincoats made in accordance with government specifications. As there was no one place in the zone where commercial raincoats could be bought in large quantities, it was necessary to go into the open market and purchase these coats from jobbers, and retailers, large and small. Authorization was secured from Washington, and the San Francisco Depot at this time purchased approximately 69,175 raincoats, valued $280,462.

The total purchases of ponchos, raincoats and slickers during the war amounted to over 10,000,000 garments, costing $46,000,000.

The lack of tonnage led to the adoption of baling garments for shipment overseas as compared with the old method of boxing them. By baling there is saved from 50 to 70 per cent of the space required for cased goods. Nine and nine-tenths blankets cased require as much space as 25 blankets baled, and fifteen and one-half slickers cased require as much space as 45 slickers baled.

Statistics recently prepared showed that this method of packing equipage, which includes all forms of clothing, such as uniforms, boots, etc., saved the Government during the war over $50,000,000 in labor, time of handling, and ship tonnage space.

ARTICLES PURCHASED BY MOTORS AND VEHICLES DIVISION.

Next in importance to the purchases of rubber made by the Clothing and Equipage Division were those made by the present Motors and Vehicles Division of the Office of the Quartermaster General, Director of Purchase and Storage. Exhaustive tire tests were made from time to time and orders placed with manufacturers who met the specifications. Tube and solid tire replacements for overseas use were heavy because of the condition surrounding operations of the vehicles.

The total amounts of rubber material purchased by the Motors and Vehicles Division of the Office of the Quartermaster General, Director of Purchase and Storage, from April 18, 1918, when the procurement of motor vehicles, tires and spare parts was consolidated in the Quartermaster Corps, and all the motor vehicle procuring organizations of all the corps of the Army from April 6, 1917, to December 16, 1919, were as follows:

Article.	Quantity.	Value.
Tires	325,983	$13,655,363.72
Tubes	898,092	2,331,439.84
Casings	784,145	15,654,601.56
Class "B" Solids (original equipment)	108,127	4,798,552.38
Hose and tubing . . . . *feet*	576,936	105,851.69
Patches (tire) . . . . *pieces*	121,873	21,096.18
Vulcanizing rubber . . . . *pounds*	729	552.94
Battery parts, hard rubber . . . . *pieces*	17,028	1,999.62
Miscellaneous	2,188	822.13
Grand total		$36,570,280.06

The cancellation of tires and tubes made up to June 30, 1919, amounted to 157,974 units, or 2,704.69 tons.

COOPERATION OF RUBBER MANUFACTURERS.

The second factor enabling the Government to obtain the necessary products made of rubber was the cooperation of the manufacturers who helped solve the problem by giving their services and converting their plants. Crude rubber was supplied to the factories through The Rubber Association of America, Inc. The allocation of raw materials was one of the chief

functions of this association. The Rubber Association on May 10, 1918, called all rubber manufacturers to a meeting in New York. At this time they were notified that the plan of allocating crude rubber under a limited tonnage arrangement for the months of May, June and July would only give each manufacturer one-fourth of the seven-sixteenths of the amount of crude rubber which each company had received throughout the year 1917. The allocation of crude rubber on July 31 was reduced to three-eighths instead of seven-sixteenths, based on the average 1917 consumption of each factory.

As showing the cooperation that existed between the manufacturers of products and the Government, the manner in which prices were fixed for rubber footwear may be cited. A letter, first of all, was addressed to the various manufacturers specifying prices and asking their concurrence. On further consideration, these prices proving incorrect, it was decided to make a more extended examination of the cost of manufacture before fixing the prices. Accordingly, a meeting of the manufacturers was held in Washington. A committee was then appointed consisting of representatives of the important rubber manufactories of the country and representatives of the Clothing and Equipage Division, with the understanding that the committee would meet in New York and consider in detail the cost sheets of the various manufacturers. The price fixed in accordance with recommendation of this committee was $5.25 a pair for hip pressure boots, with variations in price for other boots and for additional features.

SALVAGE SERVICE OF THE QUARTERMASTER CORPS ABROAD.

The third reason that the Government was able to have its demands for rubber articles supplied was due to the Salvage Service of the Quartermaster Corps, both here and abroad. Early the attention of the Army was called to the fact that rubber was not only expensive and limited in quantity, but that owing to the peculiar properties of rubber the greatest amount of care had to be taken in salvaging rubber properly.

The rubber salvaged in the A. E. F. for the year 1918 totaled 1,591,565 pounds.

The general plan of salvaging a front line sector which met with the best results consisted in outlining the main boundaries, then dividing the immediate districts into definite sectors and assigning a suitable personnel with an adequate amount of transportation to clean up the area. The salvage that was collected from this area was collected in huge piles known as advance dumps. These dumps were for convenience placed on lines of auto truck, and, if possible, rail travel. Serviceable material was held for reissue, while the other property, after being sorted, was sent to the interior depots. During an offensive operation the primary object of salvage was to collect those particular articles of salvage which were in constant demand at such a time and to return such serviceable articles with the least possible delay to the troops. Serviceable material suitable for immediate reissue was turned over to quartermaster or ordnance personnel at the collection dumps, if there was need of this material. If not, it followed the same course as any other salvage and went on to the rear. At all times, preference in salvage operations was given to perishable material, such as clothing and articles made of rubber, while articles that would not suffer from exposure were left for salvaging after the perishable things had been gathered.

Pioneer infantry and labor battalions assisted in the collection of salvage in the St. Mihiel offensive. Following heavy offensive large numbers of line troops were also employed in the collection work. It was estimated that at least 400 men for each division in the line should start salvaging when the line had stabilized after an offensive. So rapid and well organized was the work of salvage to avoid deterioration of equipment, that out of $3,100,000 worth of salvaged materials, 87 per cent of the ordnance and 47 per cent of the quartermaster property recovered was available for immediate reissue, thus largely reducing the amount shipped to the shops and depots for renovation and repair.

THE VALUE OF POSTER ADVERTISING.

The idea of salvage was a novelty and it would not be expected at first that men would save instinctively. Education along this line was needed and a definite form of propaganda was put forward to educate the men into the idea of cutting down waste.

(Signal Corps, A. E. F., U. S. Army.)

RECLAIMING SLICKERS AND SHELTER HALVES AT THE SALVAGE DEPOT, ST. PIERRE-DES-CORPS, FRANCE.

Posters and placards were printed and posted in conspicuous places calling attention to the proximity of a salvage dump or urging them to take better care of government property. One poster read: "Yank Motto—DO NOT LET Government Property Lie Around, It Spoils—TURN IT IN TO SALVAGE." Another in heavy black-faced type said: "Americans, Did You Do Anything to Help the Salvage Service To-day? Pick it up, Send it to Salvage." Still another warned the men to, "SHOOT STRAIGHT—Serve Your Country Honestly—Start To-day to Salvage." For designing salvage dumps, posters read: "SALVAGE—American Salvage Dump is Located at................ Save It—Send It to Salvage."

So effectively was this advertising campaign carried on that it was nothing unusual to see men returning from the lines with odds and ends of material that they had picked up on the field. In some cases the articles were in good repair and immediately serviceable. Others could be repaired and reissued. In still other cases it was a remnant of old harness or a piece of tattered clothing, articles perhaps of little intrinsic value in themselves, but the total numbers mounted into millions. The piece of leather, for example, which might have appeared to be an utterly worthless scrap, when collected with other scrap leather could be sold to mills and foundries for use in manufacture of carbon and case hardened steels.

Waste sales alone in 1918 totaled $39,680, while in the month of April, 1919, the sum had reached $248,675.55.

DEPOTS FOR SALVAGED MATERIALS.

Plants where unserviceable material was repaired were known in general as "Depots" or "Shops." Shops served local troops and were conveniently located at certain base ports and troop centers, while depots were situated at distribution points in the interior. Shops were in operation at Angers, Paris, Bazeilles, Savenay, Gievres, Chaumont, St. Aignan, Brest, Rochefort, Vittel, Le Mans, Tours, Nancy, and Marseilles, as well as in Winchester, England, and Coblentz, Germany. One hundred and eight buildings, with a ground space of 2,574,080 square feet, were occupied in February, 1919, by the Salvage Service, A. E. F. The combined floor space of depots, shops, and laundries was 989,860 square feet, of which 177,425 square feet was built and

owned by the United States, the rest being leased. At shops, repaired articles were in nearly all cases returned to the original wearers.

While the shops handled a large amount of the material and clothing to be repaired, it was obvious that with a military organization the size of the A. E. F. there must be a series of larger depots in the rear to handle the great mass of property collected from the field. To meet this need, the depots at Lyon, Bordeaux, Nantes, St. Nazaire and St. Pierre-des-Corps were established. To these depots, which included seven departments, viz., laundry, clothing, shoes, rubber goods, leather and harness, canvas, webbing and metals, came the grist that had been taken from the battlefield, billet, training area and other sources. Material arrived in all sorts of quantities and conditions. Nothing was too big or too small to be taken care of in these great modern repair plants. While each shop or depot was complete in itself and could handle any sort of repair work it was found often more practicable to designate some special line of work for each of the various places. For instance, the shop at Angers, started July 23, 1918, repaired hundreds of thousands of campaign hats. The general shop at Paris handled large quantities of laundry because of the facilities offered in this line by the French metropolis. To whatever depot the material came, there it was disinfected, laundered and repaired as needed. Then, from the salvage depots the reclaimed material was shipped to general supply depots for reissue.

A DEPOT IS A MODERN INDUSTRIAL PLANT.

In order to give some idea of just what a depot should consist of, the one at St. Pierre-des-Corps may be taken as an example of all the salvage depots in the A. E. F. The buildings taken over at this place had been used by the French for railroad shops and storage purposes. Under American control they presented a vast hive of industry, with workers, most of them women, seated at long rows of tables, sometimes eight hundred in a single room. There were three of these buildings, one with an area of 20,000 square feet, another of 100,000 square feet and a third of 40,000 square feet. Three other buildings, 50 by 180 feet, were later constructed. The buildings were of cement construction, light, well ventilated, and traversed by railroad tracks so arranged as to enable quick loading and unloading of cars.

(Signal Corps, A. E. F., U. S. Army.)

Salvage Dump of the 26th Division, Nanteuil-sur-Marne, France. Raincoats, Slickers and Ponchos Ready for Transport by Truck to the Railroad Cars.

Considerable improvement was effected in the buildings by the United States Engineers and Quartermaster Corps to adapt them for the purpose intended. A large power plant was installed consisting of a 300-h.-p. steam boiler, a 300-h,-p, steam engine and a 225-kilowatt electric generator. Live steam for the laundry was furnished by two 125-h.-p. locomotive type boilers, to facilitate sterilization, washing and drying operations as well as to speed up the drying of slickers and rubber boots in the rubber goods department.

Rubber boots, arctics, slickers, ponchos, and shelter halves were the articles handled by the rubber goods department. About 3,000 garments and 850 pairs of boots was the output of a twenty-four-hour day by this one depot. Slickers were first washed, then examined, the bad garments being used to provide material to repair the good. Patches that were basted on by hand went to the machines where they were stitched and the seams cemented and turned to insure them being waterproof. Boots after being washed were fitted with new taps. These were fastened with cold cement while the heels were first cemented and then nailed. Upper patches made from irreparable boots were cemented and rolled. Vulcanizing machines were installed in the process of factory development and replaced the slower method of patching.

A commissioned officer with five non-commissioned officers and 17 enlisted men composed the American personnel of the St. Pierre-des-Corps Depots, while 28 male and 290 female civilians were employed in this branch. The average wage to the female workers was from 7 to 8 francs a day, while the piece workers received as much as 18 francs a day. Production for the month of August, 1918, was valued at $231,113.83 for this one depot.

The month of April, 1919, broke all records of the A. E. F. Salvage Service with a total saving made of $13,877,872.07. Some idea of the scope of these operations can be obtained from a list of articles turned out during the month, the list including:

Article.	Quantity
Rubber goods articles	110,596
Service hats	51,628
Articles of clothing	[illegible]
Pairs of shoes	436,144
Articles of canvas and webbing	246,679
Articles of leather and harness	[illegible]
Metal articles	[illegible]

The saving of scrap rubber was a very important function of the Q. M. C. Salvage Service, A. E. F. Some 1,591,565 pounds of rubber were sent back to the United States during 1918. After the signing of the armistice, the disposition of scrap rubber was placed in Europe.

THE RECORD OF SALVAGE DIVISION AT HOME.

The record of the Salvage Division in this country during the war is equally impressive. During the fiscal year ended June 30, 1919, the Salvage Division of the Office of the Quartermaster General, Director of Purchase and Storage, renovated and returned to service the following articles made of rubber goods:

Article.	Fiscal Year, 1919.	Estimated Value.
Arctics . . . . *pairs*	27,470	$116,198
Boots, rubber . . . . *pairs*	5,441	18,499
Slickers and raincoats	88,386	256,319
Ponchos	72,275	130,095

During the same period there was collected in the United States 4,737,975 pounds of rubber waste. Of this quantity, 2,492,417 pounds were sold for a value of $93,846; a total of 564,500 pounds turned over to Army organizations representing a value of $42,586. In the period from July 1 to November 1, the Salvage Division sold 691,100 pounds of rubber for a value of $42,009.84. In the same period there were turned over to Army organizations 14,567 pounds, representing a value of $1,456.70.

The following formula is employed by the Salvage Division in washing raincoats and slickers: (1) ten minutes in cold suds; (2) cold rinse, five minutes; (3) from the washing machine the coats are taken to dry tumblers where they are run for about 10 minutes. Then these coats are allowed to hang for 12 hours. The cost of washing a slicker by this formula was 35 cents per garment in the United States.

War Department Specifications for Mechanical Rubber Goods.

General Specifications for Mechanical Rubber Goods.

War Department Specification No. 333-1-1—June 5, 1919.

THESE SPECIFICATIONS cover mechanical rubber goods used by the War Department. The following are details of such specifications and tests as are common to the articles. For specific information applying directly to particular articles, see detailed specifications which shall take precedence whenever there is any conflict.

CONSTRUCTION.

To be manufactured from the best material designated, free from any and all imperfections and of dimensions as given in the detailed specifications or proposal submitted to manufacturer.

(*a*) HOSE.—Rubber hose shall consist of a rubber tube, cotton reinforcements, and a rubber cover, and shall be of wrapped construction unless otherwise specified in detailed specifications.

Tube and cover of wrapped hose shall be smooth, free from pitting and imperfections, and of uniform thickness. All cotton canvas layers shall be applied on the bias, with edges lapped at least ½-inch (not sewed), and be well impregnated with a composition to comply with the detailed specifications.

Plies of braided hose shall be evenly braided and imbedded in a properly vulcanized rubber compound best adapted to meet the requirements.

(*b*) COUPLINGS.—Each length of hose shall be properly fitted with couplings and clamps without the use of tape or rubber tissue if, and as required in the original proposal, they shall be supplied by the War Department or as otherwise specified. The female coupling shall be properly fitted with a rubber washer supplied by the hose manufacturer, cut from a rubber tube of the same composition as the hose tube, unless otherwise specified.

(*c*) BELTING.—Rubber and balata belting shall be made of cotton duck, properly impregnated according to standard manufacturing practice, and be of the number of plies and width specified.

(*d*) PACKING.—Rubber packing shall have comparatively smooth surfaces, be free from pitting, and of uniform thickness. All rubber packing to be furnished in rolls weighing approximately 125 pounds.

(*e*) MOLDED AND LATHE-CUT GOODS.—All molded goods shall be of dimensions specified, free from surface imperfections, air checks, and pits.

BRANDING.

All branding and stenciling shall contain the words "U. S. A., ..." (blank to be filled in with such words as may be designated in the detailed specifications), manufacturer's name, and date.

(*a*) HOSE.—All wrapped hose 25 feet or over in length shall have red (unless otherwise specified) brands inlaid in the rubber cover at two places on each length, approximately four feet from the ends, letters to be at least ¼-inch high; hose less than 25 feet in length shall have one inlaid brand approximately in the center, unless otherwise specified.

(*b*) BELTING.—On the seam side of all belting over 4 inches in width, brands shall be inlaid in red rubber at least every 30 feet in letters at least ¼-inch high. For belting 4 inches and under, the same words shall be stenciled in letters 1 inch high. All balata belting shall be branded with stencil only.

(*c*) PACKING.—All packing shall be stenciled in letters at least 1 inch high every fifteen feet for rolled packing and at least once on each sheet of asbestos compressed packing.

(*d*) MOLDED AND LATHE-CUT GOODS.—Molded and lathe-cut goods shall be branded as in detailed specifications.

MATERIALS.

(*a*) COTTON REINFORCEMENTS:

WRAPPED HOSE, BELTING, AND PACKING.—The cotton fabric layers shall be well, evenly, and firmly woven from good cotton, as free from unsightly defects, dirt, knots, lumps and irregularities of twist as is consistent with the best manufacturing practice and conform to requirements of detailed specifications.

BRAIDED HOSE.—Cotton braided layers shall be of such nature as to meet tests specified.

(*b*) RUBBER:

Rubber compounds shall in all cases be properly vulcanized and meet the requirements as specified.

When fine Pará is specified it is understood to include only such grades of plantation *Hevea* rubber, as by virtue of their physical and chemical characteristics, are practically equivalent to fine pará in its performance.

Where sulphur limits are specified, mineral fillers may contain barytes, but shall be practically free from sulphur in other forms and from any substances tending to have a deleterious effect on the finished product. The sulphur in barytes shall not be included in the allowable sulphur content.

All percentages shall be based upon the weight of total rubber compound.

INSPECTION AND REHEARING.

Inspection and tests shall be made at place of manufacture unless otherwise specified, manufacturer providing a place for conducting test; also necessary help, gages, equipment, etc. In case it is not practicable to obtain suitable test specimens, the manufacturer shall furnish pieces ⅛ by 1½ by 8 inches, which he guarantees to be of the same material and equivalent cure as that used in article furnished.

Inspector shall, after tests, mark the remainder of samples with manufacturer's name, order, requisition, and item numbers and forward them to the properly designated organization for any further tests. Any lot which in any one or more tests proves unsatisfactory shall be retested by taking two additional samples which shall be at the expense of the contractor. Failure of either in any respect shall be cause for rejection.

No rehearing may be had on any rejected material unless by authority of the proper organization.

(*a*) HOSE.—Inspector may select three lengths at random from each and every shipment of 5,000 feet or less. A 3-foot section shall be cut from each length so selected for burst, after which further physical tests shall be made on the same sample, unless otherwise specified. Manufacturer shall refit couplings to said lengths which shall be accepted as full lengths provided they conform to specifications. When hose is furnished in lengths under 10 feet, extra lengths shall be furnished for test purposes at contractor's expense.

(*b*) BELTING.—Inspector may take a test sample 12 inches long from any part of each roll of belting, 4 inches and under in width; 4 inches long from belting over 4 inches in width.

(*c*) PACKING.—Inspector may select at random one test sample 10 inches long, cut across the full width of roll or sheet, from every lot of approximately 250 pounds.

(*d*) MOLDED AND LATHE-CUT GOODS.—Inspector may select at random one piece out of every 200 or less for tests.

TESTS.

All tests on material as a whole and on individual parts shall be performed according to methods adopted by the National Bureau of Standards as outlined in their circular No. 38, "Testing of Rubber Goods," in effect at date of opening of proposal.

Hydrostatic and tensile tests shall be in pounds per square inch. All samples which are subjected to a steam, oil, or aging test shall rest 24 hours before test specimens are cut.

(*a*) FABRIC.—The tensile strength shall be obtained by cutting strips from fabric 6 inches long, 1¼ inches wide and unraveled from each side to a width of 1 inch. Jaws of testing machine shall be more than 1 inch wide and 3 inches apart, separating at the rate of 12 inches per minute. Results obtained by taking the average of three tests each on both warp and filling shall be accepted as the tensile strength of the fabric. The tests shall be made when practicable after conditioning the fabric in an atmosphere having a relative humidity of 65 per cent and a temperature of 70 degrees F. for two hours. When not practicable to test as above, the fabric may be tested under existing humidity conditions and results corrected to a 6 per cent moisture basis by multiplying by the following factor:

$$\frac{100}{100 \text{ plus } 7 \times (\text{per cent moisture} - 6)}$$

NOTE.—The factor will be less than unity when the per cent moisture is greater than six and vice versa.

Moisture shall be determined by weighing six samples together before testing, and tensile strength immediately obtained in rapid succession. The broken samples (entire) after rupture shall be placed in a ventilated drying oven at 105 to 110 degrees C. (221 to 230 degrees F.) until weight is constant. Moisture present shall be calculated on this basis of the bone dry sample.

All fabric weights are given in ounces per square yard and shall be calculated on a 6 per cent moisture basis. Tolerance 3 per cent plus or minus.

(*b*) HYDROSTATIC TESTS.—To insure proper attachment of couplings when furnished with hose, pressure shall be held for three minutes on each length of hose; piece under test must not leak, sweat nor rupture the cotton canvas layers.

Bursting tests shall be made on samples 3 feet long, pressure being raised at rate of 300 pounds per minute.

(*c*) Friction Tests.—Wherever practicable all tests shall be made on an automatic friction testing machine; ply separation being 1 inch per minute. Except in rubber-lined cotton hose, width of test specimen shall be 1 inch. In all cases strength of friction shall be the average value obtained on each test, and be given in pounds.

(*d*) Rubber.—Longitudinal specimens shall be taken on hose and tubing under 1½ inches inside diameter; transverse specimens on all others..

Test specimens shall be buffed smooth to approximately not more than ⅛-inch in thickness and cut with a standard die having a constricted part ½ by 2 inches, unless otherwise specified. Tests shall not be made until sufficient time has elapsed for rubber compound to recover from stretching or handling.

AIR BRAKE AND SIGNAL HOSE AND GASKETS.

War Department Specification No. 333-1-3—June 5, 1919.

(A) AIR BRAKE HOSE. (B) AIR SIGNAL HOSE. (C) AIR BRAKE AND AIR SIGNAL HOSE GASKETS.

General.—(*a*) This specification covers the requirements for air-brake, air signal hose, and gaskets.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods, which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

Construction.—See General Specifications.

(*a*) Dimensions to conform to the table below.

(*b*) Cotton canvas layers shall be applied on a bias of from 42 to 46 degrees

(*c*) Hose to be capped with same rubber compound as tube.

(*d*) Each length properly fitted with Master Car Builders' (MCB) standard air-brake or air signal couplings, if specified.

(*e*) If coupled, coupling shall be put in end near which brand is located.

(*f*) Gaskets must be uniform in size and section and of dimensions conforming to figure 1.

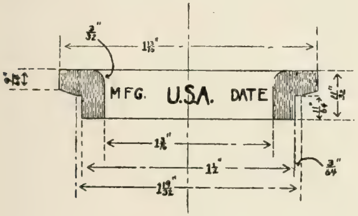


Fig. I.

Branding.—See General Specifications.

(*a*) Hose.—A 1-inch side label shall be applied 6 inches plus or minus ½-inch from one end of base with the top of lettering toward the center of the hose. Use the words, "Airbrake" on air brake hose; and the words "Air Signal" on air-signal hose.

(*b*) Gaskets.—See Figure I.

Materials.—See General Specifications.

(*a*) The fabric shall be made of long-staple cotton having not less than 16 nor more than 22 threads of 5-ply yarn per inch, each in warp and filling, and weighing not less than 19.8 ounces per square yard.

(*b*) Gaskets shall be made of such a compound that they will be tough and yet have enough elasticity to conform to the requirements for strength and elongation.

Inspection.—See General Specifications.

(*a*) Inspector may take one length at random from each shipment of 200 lengths or less of hose, from which he shall cut a 5-inch section. Two 1-inch sections shall be cut from this 5-inch piece for making friction, stretching, and tensile tests; the remaining 3-inch section shall be used for making additional tests which may be desired on the tube and cover.

(*b*) Inspector shall examine such lot of gaskets for size and workmanship, and shall take samples therefrom for tests.

Tests.—See General Specifications.

(*a*) Hose.

1. See the following table.
2. Test samples not to be buffed.
3. Stretching test.

Test specimens from tube and cover will be quickly stretched until the 2-inch marks are 10 inches apart and immediately released. They will then be remarked as at first within 10 seconds after starting to release and again stretched to 10 inches between the new marks, remaining stretched for 10 minutes. The specimens shall then be completely released, and within 30 seconds after starting to release the distance between the marks last applied will be measured, and the initial set shall not be more than ¼-inch. At the end of 10 minutes the distance between the marks will again be measured, and the final set shall not be more than ⅛-inch. These test specimens may be cut from the tube and cover of the friction test specimen, but shall not be used fgr tensile test.

POROSITY TEST.

The remaining 17 inches shall be mounted and placed in a test rack, the circumference will be measured and the hose filled with air at 140 pounds pressure per square inch, the rubber cover shall be cut from clamp to clamp (taking care not to injure the duck) and this pressure maintained for five minutes. At the end of this time the hose will be submerged in water to determine whether the inner tube is porous. The escape of air through the tube shall be distinct enough so that the porosity will not be confused with the escape of air which is confined in the structure of the hose. In the event the hose fails on bursting test at the point at which cut was made for porosity test and a satisfactory hydraulic test is not obtained, the porosity and hydraulic test will be repeated on another piece of hose.

The section of hose which was used for porosity test shall also be used for the hydraulic tests.

If the tensile strength in pounds per square inch is greater than that required, the sample may be accepted providing the per cent increase in elongation is equal to or greater than the per cent increase in tensile in pounds per square inch above the maximum figure.

(*b*) Gasket.

DEFLECTION TEST.

Gaskets shall be subject to a deflection test which shall consist of suspending a weight of 20 pounds on the gasket. Under this load the increase in inside diameter shall not be more than ⅞ inch, the measurement to be taken on the inside of the gasket with the load applied, and within 15 to 20 seconds after the application of the load. support, and the hook to which the weight is attached, shall have a diameter of ¼ inch.

TENSION TEST.

When the samples for test are received they will be examined for size and workmanship. The gaskets will be tested in tension in a manner similar to that of the tensile test of a single link of a chain. The half-links used to pull on the gasket will each be provided with 180 degrees fillet of the same diameter as the original inner diameter of the gasket—that is, the two semicircular fillets of the pulling links will just fill the inside of the gasket. They should sustain an ultimate load of 100 pounds and show an elongation of original diameter of 350 per cent when tested as described above.

REJECTION LIMITS.

If any of the sample gaskets representing a lot should fail under a load of less than 90 pounds, or if the elongation is less than 200 per cent, the entire lot represented by the sample will be rejected. If the tensile strength of any sample tested is more than 125 pounds the lot will be rejected, unless the elongation obtained from such samples is more than 275 per cent.

Table.

		Air brake.	Air Signal.
Size, minimum	inches	1⅜	1⅛
Inside diameter, maximum	inches	1 7/16	1 3/16
Outside diameter, minimum	inches	2 1/16	1 13/16
Outside diameter, maximum	inches	2⅛	1⅞
Length, minimum	inches	22	22
Length, maximum	inches	22½	22½
Thickness:			
Tube minimum	inch	3/32	3/32
Cover, minimum	inch	1/16	1/16
Cap, minimum	inch	1/32	1/32
Cap, maximum	inch	3/32	3/32
Porosity test, minimum	pounds	140	140
Hydrostatic tests:			
Expansion test			
Pressure, minimum	pounds	200	200
Increase in circumference, maximum	inch	¾	11/16
10-minute test without bursting, minimum	pounds	500	500
Bursting, minimum	pounds	700	700
Tensile:			
Tube, minimum	pounds	800	800
Tube, maximum	pounds	1,200	1,200
Cover, minimum	pounds	700	700
Cover, maximum	pounds	1,100	1,100
Ultimate elongation, tube and cover, minimum	inches	240	240

STEAM HOSE.

War Department Specification No. 333-1-11—June 5, 1919.

General.—(*a*) This specification covers the requirements of

hose for general use in conveying steam or hot water under pressure; also for car heating purposes.

(*b*) See War Department Specification No. 333—1—1, headed General Specification for Mechanical Rubber Goods, which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(*a*) DIMENSIONS.—See the following table.

(*b*) No washers to be furnished.

BRANDING.—See General Specifications.

(*a*) Use the word "Steam."

MATERIAL.—See General Specifications.

INSPECTION.—See General Specifications.

(*a*) Inspector may select four lengths at random from each shipment of 100 lengths or less, and cut from each length selected a 3-foot section; two sections for steaming and the others for remaining tests.

TESTS.—See General Specifications and following table.

(*a*) Test specimens shall not be buffed.

(*b*) STEAMING.—The ultimate tensile strength shall be determined by using the original thickness of samples in calculating the area. When calculating the tensile strength after steaming the test piece shall be considered as having the same thickness as that used before steaming.

A sample not less than 18 inches long shall be subjected to dry saturated steam in a digester for a period of 48 hours at a pressure of 45 pounds. After this test, the tube and cover shall not show any blisters, nor loosen from the plies of fabric. After resting, test piece shall be cut at least 4 inches from end and shall meet the figures indicated in the following table:

SIZE (I. D.)	5/8 INCH.	1 INCH.	1½ INCHES.	1⅝ INCHES.	1¾ INCHES.
Outside diameter ....inches	1⅝	1 13/16	2 5/16	2 11/16	2 13/16
Tolerances:					
I.D., plus or minus..inch	1/64	1/64	1/64	1/64	1/64
O.D., plus or minus..inch	1/16	1/16	1/16	1/16	1/16
Thickness:					
Tube, minimum ......inch	⅛	⅛	⅛	⅛	⅛
Cover, minimum .... inch	3/32	3/32	3/32	3/32	3/32
Length, as specified in proposal.					
Tests:					
Hydrostatic—					
Coupling, minimum.lbs.	200	200	200	200	200
Burst, minimum...lbs.	800	800	800	700	700
Friction—					
Before steaming minimum ....lbs.	20	20	20	20	20
After steaming minimum ....lbs.	15	15	15	15	15
Tensile, minimum—					
Tube, before steaming lbs.	600	600	600	600	600
Tube, after steaming, lbs.	450	450	450	450	450
Cover, before steaming, lbs.	600	600	600	600	600
Cover, after steaming, lbs.	450	450	450	450	450
Ultimate elongation, tube and cover—					
Before steaming, minimum ....inches	2-6	2-6	2-6	2-6	2-6
Before steaming, maximum ....inches	2-10	2-10	2-10	2-10	2-10
After steaming, minimum ....inches	2-5	2-5	2-5	2-5	2-5
After steaming, maximum. ....inches	2-9	2-9	2-9	2-9	2-9

(*To be continued.*)

Detection and Determination of Glue in Rubber Goods.[1]

By S. W. Epstein and W. E. Lange.

GLUE is one of the latest additions to the long list of materials which have found application in rubber compounding. Its use has been attended with such striking success that it is becoming more and more prevalent in rubber stocks. As a consequence, the rubber analyst has another organic constituent to contend with in the determination of rubber hydrocarbon by difference. In order to be able to rely upon the figure for rubber hydrocarbon in a rubber mixing, it is necessary to know whether or not glue is present and when it is, the quantity must be determined.

The use of glue in rubber is such a comparatively recent thing that up to the present its detection and determination have received little attention. After one has found out that it is impossible to extract the glue from a cured rubber stock by means of boiling water, the problem of finding a satisfactory method takes on a formidable aspect. The problem presented two angles from which it could be attacked, namely: (1) by dissolving away the rubber and leaving the glue unchanged so that it could be dissolved in water and the glue determined by the weight of the water extract; (2) by determining the nitrogen content and calculating this to glue by means of the factor 5.56.

Believing that a Kjeldahl determination is too long for ordinary laboratory practice, we undertook to dissolve the rubber and attempted to get the glue in the residue. We found that the nitrosite and bromine methods of converting rubber into a soluble derivative could not be used since the glue seemed to be acted upon. The residue, which was left after the removal of the rubber compounds, when extracted and digested with hot water, gave extracts which contained less than 50 per cent of the total glue present; in addition, this water solution would give none of the tests which are used to detect the presence of glue.

We next directed attention to rubber solvents, especially to those which would dissolve rubber at comparatively low temperatures, since a high boiling solvent decomposes the glue and is therefore inapplicable. After considerable experimentation it was found that cresol seemed to be satisfactory for the purpose. Rubber can be dissolved in it and the resulting solution, after it has been diluted with petroleum ether, can be filtered with ease. When glue is treated with cresol, it dissolves very readily but is precipitated in large part from this solution on the addition of petroleum ether. Experiments showed that on the average about 70 per cent of the glue could be precipitated from its cresol solution. The precipitation, therefore, could not be used as a quantitative procedure for a glue determination. However, this precipitate settled out very well and dissolved readily in water, giving a solution which answers all the tests for glue and the procedure can be used as the basis of a qualitative test for glue in rubber "mixings."

QUALITATIVE METHOD.

About 0.5-gram of the rubber sample to be tested for the presence of glue is digested in 25 cc. of freshly distilled cresol (boiling point 195 degrees C.) in a tall beaker for about 16 hours at 120 degrees C. This digestion is conveniently carried out by placing the beakers in a properly regulated Freas oven and allowing them to remain there over night. The cresol solution is allowed to cool and 250 cc. of petroleum ether is added slowly with constant agitation. When this solution has settled and the supernatant liquid is clear it is filtered through a Gooch crucible, using gentle suction. The beaker, contents and crucible are washed thoroughly with petroleum ether, then with hot benzol. The pad is removed from the crucible, placed inside of the beaker and digested

[1] Published by permission of the Director of the Bureau of Standards, Washington, D. C.

for several minutes with boiling water. The solution is filtered through a folded filter paper and evaporated to a volume not to exceed 150 cc. After it has cooled it is poured very slowly into a 5 per cent solution of pure tannic acid. In the presence of glue a cloudiness will appear at first and finally a precipitate as more of the glue solution is added. Large percentages of glue give heavy curdy precipitates while small quantities give decided cloudiness. In the absence of glue no permanent precipitate or cloudiness will appear in the tannic acid solution as the liquid is added to it.

In order to test the reliability of this qualitative procedure in detecting varying quantities of glue, mixings were made up which contained from 0.9 per cent to 10.0 per cent of glue, the balance of the compound being rubber (40 per cent), zinc oxide, magnesium oxide, gas black, mineral rubber and sulphur. They were run through the above procedure with the following results:

Percentage of Glue	Appearance of the Solution on Addition to Tannic Acid
0.00	Solution remains perfectly clear. No cloudiness.
0.9	Distinctly cloudy.
1.7	Cloudiness much denser than the above.
2.6	Cloudiness almost opaque. Precipitate.
[illegible]	Absolutely opaque. Precipitate.
4.3	Fairly heavy precipitate.
6.3	Heavy precipitate.
[illegible]	Very heavy precipitate.
10.0	Very heavy precipitate, which showed its curdy character very plainly.

The observations given above demonstrate conclusively that even the smallest practicable amount of glue can readily be detected by means of the procedure recommended here.

Many experiments were carried out in order to ascertain whether ingredients other than glue would dissolve in water and precipitate the tannic acid solution and in this way be mistaken for glue. It was found that magnesium oxide and calcium oxide dissolve to a considerable extent in hot water after they have been treated with cresol and the water solution that is obtained precipitates tannic acid when the reagent is not in excess. However, these precipitates are readily soluble in excess of tannic aid, while the glue-tannate precipitate is insoluble. Therefore it was recommended in the method given above that the solution to be tested for glue be added to the 5 per cent tannic acid solution. In this way the magnesium and calcium precipitates will be dissolved immediately as they appear and will become permanent only when a considerable quantity of their solutions has been added. In this way there will be no chance of mistaking them for glue since the glue precipitate will appear immediately and will be permanent, even when only a small quantity of its solution has been added. We have been unable to find anything else which would be present in this solution and would give a permanent precipitate when added to tannic acid. There is therefore no danger of misinterpreting the tannic acid precipitate; when it is obtained the presence of glue in the rubber mixing cannot be questioned.

QUANTITATIVE METHOD.

However, since the method is not quantitative, after the presence of glue has been proved, its amount must be determined. The only means we have found by which this can be done is to determine the nitrogen by the Kjeldahl procedure and calculate the amount of glue from it. This was found to be satisfactory and results were obtained which were usually 0.1 per cent to 0.2 per cent higher than the true value. The method is practically the same as that followed out in most laboratories. It is as follows:

Extract a two-gram sample with acetone for six hours, and then with chloroform for three hours and dry. Transfer the sample to a 750-cc. Kjeldahl flask. Add 25 to 30 cc. of concentrated sulphuric acid, 10 to 12 grams of sodium sulphate, and about one gram of copper sulphate. Place the flask on the Kjeldahl digesting apparatus, and heat gently until the first vigorous frothing ceases, then raise the heat gradually until the liquid boils. Continue the boiling until the solution becomes clear. Allow the flask to cool to 40 degrees to 60 degrees (If allowed to become thoroughly cold the solution solidifies); dilute carefully with 150 cc. of water; allow to cool. Add 100 cc. of 50 per cent sodium hydrate solution, pouring it carefully down the side of the flask, so that it does not mix immediately with the acid solution. Add about one gram of granulated zinc to prevent bumping, and a piece of paraffine the size of a pea to diminish frothing. Connect the flask quickly with a condenser, the delivery tube of which dips into a 500-cc. Erlenmeyer flask, containing 50 cc. of tenth normal sulphuric acid, diluted to about 100 cc. Shake up the Kjeldahl flask and heat gently at first, increasing the flame as the danger of foaming over diminishes, finally boiling briskly until about one-half of the liquid has passed over into the receiver. Add one cc. of methyl red solution, and titrate the excess acid by means of standard sodium hydrate solution.

Calculation:

$$\frac{100\ (\text{cc. } H_2SO_4 \times \text{normality} - \text{cc. NaOH} \times \text{normality}).\ (0.014 \times (5.56)}{\text{Weight of sample}} = \text{Percentage glue.}$$

When light-gravity stocks are analyzed as above, inexperienced manipulators may not find glue when it is present. Such stocks float on the surface of the acid and allow the glue to be driven off by the heat before the nitrogen in it has been converted into ammonium sulphate and therefore no ammonia will be obtained. This difficulty can be overcome by constant agitation of the flask so that the rubber is kept moistened with acid until it is attacked. This laboratory has found it very convenient to add a small quantity of bromine to the rubber, which makes a brominated mass that sticks to the bottom when the acid is poured over it. There is therefore no danger of driving off any of the glue and the constant agitation and attention otherwise necessary can safely be dispensed with.

CONCLUSIONS.

1. The method presented will detect as little as 0.9 per cent of glue in a rubber mixing. It has been found, by experiment, that no substance other than glue will answer to this test when it is carried out as directed, and the method is reliable and convenient.

2. When glue is present in a rubber sample its quantity is arrived at by determining the nitrogen content by means of the Kjeldahl procedure and calculating this to glue. We have been able to find no other satisfactory quantitative method which would give the correct percentage of glue.

THE ADVANTAGES OF RECORDING THERMOMETERS.

As an illustration of what can be accomplished by watching results, the story is told of a large factory that had two vulcanizing departments in one of which an installation of six thermometers on the vulcanizers gave greatly improved results. In the other mill there were twelve vulcanizers, but because of some difficulty with the vulcanizer man, the superintendent hesitated to put in thermometers. Finally the man was induced to try one out, and after a short trial he equipped all his vulcanizers, and said that he wondered how he had gotten along without them. In explanation he stated that before he had recording thermometers installed, if a heat came out badly he would have to spend two or three days and sometimes nights personally investigating before the cause was discovered. But, with the recording thermometers, he first looked at the chart records and if these agreed with the predetermined temperature he knew that something was wrong with the mixture. Thus he was enabled to put his finger on the trouble at once and correct it without waste of time and without overmuch damaged material.

What the Rubber Chemists Are Doing.

AGING EXPERIMENTS ON VULCANIZED PLANTATION PARA RUBBER.

Captain B. J. Eaton, F. I. C., and F. W. F. Day of the Experimental Vulcanizing and Chemical Laboratory, Agricultural Department, Federated Malay States, have reported their investigations on the aging changes which take place in vulcanized Pará rubber, of which the following is a condensed account:

Preliminary investigations were made as a guide to a systematic examination of aging phenomena by experimenting on samples of rubber which had been considerably overvulcanized, since the changes would be emphasized in such samples and would be accelerated.

These samples consisted of "slab" rubber (coagulum matured for at least six days before machining to crêpe and crêpe rubber. The samples were prepared under comparable conditions and mixings containing ten per cent of sulphur and 90 per cent of rubber were prepared and cured at 140 degrees C. for varying periods of excessive cure. It was discovered, however, that no useful deductions could be drawn from the figures obtained owing to the remarkable increase in weight which occurred in the crumbled samples after storage, this is, on aging. These large increases in weight were not followed up in these preliminary experiments. The results indicated that much overcured samples would give even greater increases over similar periods.

As it was practically certain that the increases in weight were due to oxidation, the presence of substances soluble in water was tested by extraction of the samples in boiling water and the percentage of extract (by difference), the percentage of sulphur in the form of sulphate, and the total acidity of the extract of sulphuric acid were determined in terms of sulphur. The extraction with water was followed by extraction with acetone in order to obtain the free sulphur content and the additional matter extractable by acetone. A remarkable percentage of matter extractable by water was formed during the aging. The amount of sulphur present as sulphates in the aqueous extract was also marked. The acetone extract contained substances other than the sulphur and the resin which would be present in the original raw rubber (which ordinarily amounts to 2.3 per cent).

No further deductions can be drawn from the results since the increases in weight of the samples had not been determined. Some of these increases are nearly 40 per cent, which would bring the total sulphur content of the samples, calculated on original weight, up to about nine per cent, which still indicates an actual loss of sulphur on aging.

SCHEME OF EXPERIMENT.

As a result of the preliminary experiments mentioned above it was decided to trace the changes, due to aging, in the combined sulphur content, and the aqueous and acetone extracts, after making allowances for the oxidation or other changes in weight. For this purpose, two sets of about ten grams of crumbed rubbers were stored in specimen tubes. The first set was used to provide samples for analysis at different periods, while the second set was weighed at intervals but not otherwise disturbed. In addition, two grams of each crumbed rubber were left on watch-glasses and also weighed at intervals, as it was thought that aging (as indicated by increase in weight) would proceed more rapidly in the case of crumbs exposed to the air and under different conditions from those packed in closed tubes.

Further, eight-gram disks about five millimeters thick and 44 millimeters in diameter were also exposed in small watch-glasses. These were used in order to retain any sulphur exuding on the surface due to the well known "blooming" of vulcanized rubber.

[1]"Journal of the Society of Chemical Industry," September 15, 1919, page 339T.

INCREASE IN WEIGHT ON STORAGE.

During the first ten days a slow increase in weight took place in all the samples, after which period the factors favoring a rapid increase are: (*a*) overcuring of the rubber; (*b*) freedom from complete exposure to the air. The most rapid increase was shown by the most overcured sample exposed on a watch-glass.

A similar relationship holds good between the tube stored and watch-glass stored samples for each pair of samples. In every instance the increase in weight of the tube stored samples overtook those of the watch-glass stored samples after periods ranging from one to two and one-half months, the period increasing according as the overcuring of the sample is less. Comparing the cures obtained by plotting the data from these samples shows that excessive overcuring appears to be the principal factor affecting the type of curve In the case of watch-glass stored samples the tendency to keep below the tube stored samples for an indefinite period, that is, to gain weight more lowly, was very marked.

It seems clear that the explanation lies in the fact that while increases in weight are proceeding uniformly in both sets of samples, a loss of weight is proceeding at the same time in the freely exposed samples, which leads to an apparent retarded increase.

Results from four samples investigated indicated that overcuring beyond a certain point ceases to increase the capacity of a rubber to gain weight during storage, and warrants the assumption that excessive overcuring does actually decrease the capacity of aging as measured by weight increase.

COMBINED SULPHUR CONTENT.

Only the much overcured crumbled samples showed combined sulphur changes on aging. Normally cured samples did not show much variation in this respect, although some changes could be traced. These changes were, however, small and irregular.

It was noticed generally that the color changes of the samples of stored crumbs which took place were greatest in those portions in contact with the sides of the tubes, that is to say, the portions exposed to light. The central portion or core of the tube-stored crumbs appeared to be unaffected in the undercured samples. The overcured samples, however, broke down to a powder. Probably, therefore, if given sufficient time, the full aging effect of 40 per cent increase in weight would develop in all the samples.

From a study of the changes in sulphur content and weight it is evident that very complex changes are proceeding in which the loss of sulphur compounds at one time exceeds, proportionately, the loss of other constituents. It is also clear that at a later stage the conditions are reversed, leading to an increase in sulphur content, and throughout the whole period of change a steady gain in weight, due presumably to oxidation, is taking place.

AQUEOUS AND ACETONE EXTRACTS.

Some idea of the changes in the proportions of sulphur soluble in water and in acetone can be obtained by extraction in boiling water and acetone. Close analysis of the results is impossible, owing to the weight increases, and it is not possible to eliminate the effect of these changes. The results show that complex changes are occurring which it is impossible to examine at this stage of the work.

CONCLUSIONS.

It is not yet possible for the authors to draw very definite conclusions, since the changes taking place in vulcanized rubber on aging are obviously complex. They have placed their results on record because the literature on this subject does not appear

to contain any results similar to those they have obtained in respect of (1) the large increases in weight on storage, (2) the formation of a large aqueous extract in the samples, and (3) the conversion of the sulphur to a large extent into aqueous soluble compounds.

PRACTICAL SYNTHETIC RUBBER.

The practical manufacture of synthetic rubber in Germany under war conditions is described in *"Gummi-Zeitung,"* July 11, 1919, page 750. The most available source was found to be calcium carbide, from which methyl rubber was produced from acetone in accordance with the following procedure:

SYNTHESIS OF RUBBER.

The acetylene gas produced from calcium carbide and water changes in the pressure of contact bodies by the addition of water into acetaldehyde. This is oxidized with acid into acetic acid, which is separated into acetone by elimination of carbonic acid by blowing over a contact substance. This liquid is diluted with benzol and under proper conditions is reduced in the presence of aluminum scrap into pinacone, a crystalline substance of 42 degrees C. melting point and 170 degrees C. boiling point.

After reduction the mixture is diluted with water and distilled. Any undecomposed acetone-benzol mixture is first removed and later parted by separate distillation. Only on further distillation are these converted into oils, boiling at a higher temperature, most of which contain pinacone. These higher boiling oils are treated with water, whereupon pinaconehydrate appears as a white crystalline product. This is then treated with acid salts on free acid to obtain dimethyl butadiene having a boiling point of 70 degrees C. and is freed by fractional distillation from the by-product pinacoline, a mixed ketone boiling at 106 to 120 degrees C. The dimethyl butadiene is placed in vessels where by the addition of a small quantity of a catalyzer it is polymerized into methyl rubber. The total amount of methyl rubber obtainable from acetone is about 40 per cent.

COMMERCIAL VARIETIES.

Methyl rubber was produced by the *Farbenfabriken,* Elberfeld, in two qualities, one designated as "H" and the other as "W." The H variety results from cold polymerization (about 35 degrees C.) and is adapted to the manufacture of hard rubber, while the W variety results from warm polymerization (about 70 degrees C.) and is suitable for making soft rubber goods.

PROPERTIES AND DEFECTS.

Both sorts of synthetic rubber require a long time for polymerization, the H three and one-half months and the W as long as five months. Neither form is stable but oxidizes readily in the air as soon as formed; consequently a preservative agent is required to prevent this. At first, aldehyde ammonia was used, next piperidine, followed by experiments with other agents. At the same time a vulcanization acceleraator is incorporated.

On account of their instability these rubbers are shipped in tightly closed zinc-lined iron containers.

H SYNTHETIC RUBBER.

More of the H grade is used than of the W. It is yellowish in color and very dry and stiff because the masses are heavily pressed together, expelling the air from the interior to secure protection against oxidation. The characteristic properties of extensibility and toughness which mark natural rubber are present in much less degree in methyl rubber. The latter crumbles at first on the mill almost completely and reunites into a sheet only after prolonged milling.

The milled rubber becomes capable of taking up compounding ingredients only after an hour of milling. Likewise, long milling is found necessary to eliminate porosity and secure solidity in molded work. The milling should take place only on moderately warm mills. Under hot milling, H rubber becomes sticky. In order to increase its capacity to absorb filling materials it is found advisable to wash the rubber thoroughly. It then becomes necessary to dry it completely at low temperature to avoid oxidation and conversion of the rubber into a dark sticky mass in which condition it is not suited to vulcanization and produces only porous products. Washed and dried H rubber is even softer and more elastic after vulcanization than products made from the same rubber unwashed.

When heated in the air to its melting point, H rubber oxidizes and the rubber molecule breaks down, as inferred from the fact that when similarly heated at considerable temperatures in inert gases such as nitrogen, carbonic dioxide, and sulphuretted hydrogen this effect is not observed.

To increase the ability of the rubber to absorb compounding ingredients the *Farbenfabriken,* Elberfeld, recommends the addition of a certain percentage of their ER solution or from five to ten per cent of pinacoline. The addition of a small amount of reclaimed rubber permits the more ready absorption of large quantities of mineral ingredients.

To increase the elasticity of synthetic rubber a number of minerals are recommended such as diphenylamine, diamethylaniline and toluidine.

The chief accelerator employed is the preparation known as Vulcacit. This material also acts powerfully in the acceleration of the cure of natural rubber.

The W variety of methyl rubber is much darker than the H grade. It is reddish brown in color. In structure it is net-like and is strongly suggestive of natural rubber. On the mill rolls it is tough and would readily be mistaken for natural rubber. It differs, however, by reason of its internal stickiness. On its torn edges it presents fine silk-like threads. While both grades are suitable for mold work the W grade is not so readily moldable as the H grade. In the case of plied up articles extra pressure must be used during the vulcanization to insure adhesion of the component parts.

NATURAL AND ARTIFICIAL RUBBER.

The investigation of A. Tschirch on the constitution of natural and artificial rubber has been published in *"Schweitzer Chemiker Zeitschrift,"* 1919, pages 153-156. In abstract his results are as follows:

The term rubber covers a variety of raw materials. Those of African origin furnish colloidal solutions with chloroform, whereas *Hevea* and *Manihot* rubbers are only slightly soluble, though they swell up considerably in that solvent. The term "synthetic" rubber is incorrect because the synthesis is confined to a single constituent which the author designates as "caoutchougutta," a mixture of hydrocarbons in various forms and in varying quantity in one and the same kind of rubber.

The substance known as synthetic rubber is not identical with the caoutchougutta of the natural article. Natural rubber is by no means the unaltered sap of rubber plants. It contains protolactoretin, and undergoes alteration shortly before it exudes into the air, further changes ensuing during coagulation and smoking. Protolactoretin is a polymer of isoprene, and is not the same in all rubber plants. Commercial rubber is regarded by the author as a semi-manufactured article rather than a natural product.

According to the author, synthetic rubber is analogous to Pará rubber, the artificial caoutchougutta being derived from aliphatic hydrocarbons (mythylated butanes). The varying solubility of rubbers probably may be due to the structural conditions of the colloid substance. Rubber occupies an intermediate position between the emulsoids and the dispersoids, and is heterogenous, containing at least two structural phases, a solid colloidal solution. Under the microscope Pará rubber that has been extracted with chloroform is seen to consist of a fine network of minute straight and bent rods, forming the turgescent component, which, however, in the case of extracted synthetic isoprene rubber, is irregular and not reticulated.

The author considers that the peculiar structure of Pará rubber is the cause of its superiority to synthetic and the other natural rubbers. A feature common to both Pará caoutchougutta and that from synthetic isoprene rubber is the presence of a constituent (A-caoutchougutta) soluble in chloroform, and a second (B-caoutchougutta) insoluble but turgescent in that solvent, this second constituent acting as a solvent of the first and forming the reticulate structural component. Methyl rubber contains no turgescent component and dissolves slowly and completely to a viscous, clear colloidal solution in chloroform. Great stress is laid on the nature of the turgescent component as an indication of the technical value of rubber. The proportion of this component is lowered by the process of mastication.

CHEMICAL PATENTS.

THE UNITED STATES.

Process of Recovering Plastic Rubber from Fabrics which consists in progressively disintegrating the fabric in presence of water and simultaneously stripping the plastic rubber from the fabric and from the threads and fibers resulting from its disintegration. (Theodore F. Furness, Cynwyd, Pa., assignor by mesne assignments to Acushnet Process Company, New Bedford, Mass. United States patent No. 1,321,200.)

Process for Reclaiming Rubber and Cotton from Rubber Waste which comprises the steps of wetting the waste, passing it between rollers whereby the waste is formed into a sheet, and feeding such sheet gradually to a high speed picker causing the fabric to be torn from the sheet in the form of threads and fibers while the rubber is torn from the sheet in small balls and particles. (Philip E. Young, Fairhaven, Mass., assignor to Acushnet Process Company, New Bedford, Mass. United States patent No. 1,321,201.)

Reclaiming Rubber.—In the manufacture of rubber a method which consists in adding proteid to a fresh rubber stock prior to the vulcanization thereof, vulcanizing the fresh product, reclaiming the vulcanized product and revulcanizing the reclaimed product. (Clayton W. Bedford, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio. United States patent No. 1,321,501.)

Rubber Substitute.—The process and product which consists in combining fish oil and sulphur in the presence of heat and resubjecting the resultant combination to heat under pressure. (Morton Gregory, assignor to Western Rubber Co., both of Tacoma, Washington. United States patent No. 1,321,788.)

Process for Devulcanizing Rubber.—Comprising boiling rubber with a liquid of which a large proportion is a hydrocarbon of a viscid and gummy nature, forming a yeasty froth on the surface of the liquid and having an affinity for sulphur, under the conditions created, greater than the lessened affinity for sulphur possessed by the rubber, whereby combined sulphur will be liberated from the rubber. (Cyrus Field Willard, San Diego, California. United States patent No. 1,322,077.)

Devulcanizing Process and Product. Boiling vulcanized rubber with a viscous mixture of a tar and a flux of a liquid hydrocarbon in the presence of water. (Cyrus Field Willard, San Diego, California. United States patent No. 1,322,151.)

Process for Devulcanizing Vulcanized Rubber, comprising effecting the liberation of more or less of the combined sulphur by boiling the rubber with an emulsoid colloid solution and a detergent or cleansing solution. (Cyrus Field Willard, San Diego, California. United States patent No. 1,322,152.)

Treating Rubber by incorporating therewith sulphur and titanic oxide and vulcanizing the mixture. (Louis E. Barton, Niagara Falls, New York, assignor to The Titanium Alloy Manufacturing Co., New York City. United States patent No. 1,322,518.)

Plastic Composition consisting of caoutchouc, wax, non-drying oil, inert filler, and coloring matter. (Stanley H. Rood, Hartford, Connecticut. United States patent No. 1,322,823.)

THE UNITED KINGDOM.

Rubber Composition consisting of powdered slate mixed with rubber, rubber substitute or waste or recovered rubber and sulphur. Example: 50 parts of slate, 35 of rubber and 15 of sulphur yield a product suitable for packing, tires, mats, etc. (W. F. Macdonald, 53 Palace Court, Bayswater, London. British patent No. 130,528.)

GERMANY.

Process for Making Hard and Soft Rubber Factice.

Soft Factice. Into a mixture of 100 parts of linseed oil, 10 parts of acetic acid, and 10 parts of a 10 per cent solution of ammonia are poured in a thin stream 20 parts of chloride of sulphur thinned with 20 parts of water and neutralized with 20 parts of a 15 per cent solution of ammonia. The mixture is steamed and dried until thick flowing. The product is a very elastic, soft, rubbery mass, which, on being heated to 240 degrees C., becomes homogeneous and weatherproof. Formic, acetic, or other fatty acids, or unsaturated acids of the acetic series, may also be used.

Hard Factice. Liquid emulsions prepared according to above example are neutralized with ammonia, steamed until they are plastic, and mixed with three parts by weight of lead, zinc or iron oxide and sulphuret of antimony. The mass is pressed in vacuum at 50 to 70 degrees C., then dried and pressed for six hours at six or more atmospheres. The result is a solid rubber-like mass which can be used as a substitute for hard rubber. (H. Otto Traun's Research Laboratory, Hamburg. German patent No. 314,560. February 25, 1915.)

OTHER CHEMICAL PATENTS.

GERMANY.

PATENTS ISSUED, WITH DATES OF APPLICATION.

317,641. (April 16, 1916.) Artificial arm. Allgemeine Krankenhaus-Einrichtungs Geschellschaft m.b.H., 20-21 Johannisstrasse, Berlin, and Karl Albert Scherer, 113 Hartwigstrasse, Berlin-Pankow.

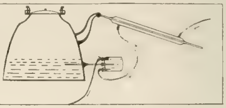
317,695. (April 25, 1917.) Packing with rubber ring, particularly for coolers with interchangeable parts. Suddeutsche Kuhlerfabrik, Feuerbach, Württenberg.

LABORATORY APPARATUS.

AN ALUMINIUM WATER STILL.

Pure distilled water especially free from potassium, sodium and copper is obtainable by the use of an aluminum still described by T. O. Smith in "The Chemist-Analyst."

The apparatus is set up as follows: a hole is punched from the inside of an aluminum tea kettle, about two inches from the bottom, with a sharp punch so that the edges of the hole are smooth, without cracks and flared as much as possible. Into this hole is fitted an aluminum tube of convenient length for connecting a leveling bottle as shown in the drawing. The tube is secured and the hole made water-tight by wrapping the flared edges and the tube with cotton yarn to a thickness of about one-half inch. A Liebig condenser is fitted with an inner tube of aluminum into the spout of the kettle, and connection made tight with cotton yarn wrapping. The lid is held on by small clamps A three-hole Woulfe bottle connected with the leveling tube from the kettle receives the overflow from the condenser through a rubber tube and maintains the water in the kettle at the level of the overflow opening from the bottle. This overflow opening is provided with a curved glass tube for equalizing the air pressure in the bottle. In this manner the waste water from the condenser is made to replace the water in the kettle as fast as it is removed by distillation.

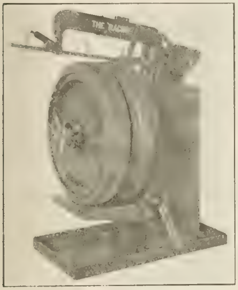


A Novel Still.

New Machines and Appliances.

MACHINE FOR CUTTING PRESSED ON TRUCK TIRES.

SERVICE stations find it frequently impossible to press off old tires no matter what size press is used. This is especially true in the case of "stickers" or tires on which the rim has been turned by contact in the street with stones, etc. Very few stations are equipped with presses of sufficient throat opening to handle large size dual tires and in trying to press off these tires the press is broken. To afford a simple and efficient means for overcoming these difficulties the machine here pictured has been especially designed for cutting off pressed-on truck tires.



Solid Tire Cutting Machine.

The basic principle of the power hack-saw has been combined with the mechanical features necessary to perform efficiently the wide and varying work required by a machine of this type. The machine is of heavy construction and designed with the idea of giving dependable service under the hardest working conditions.

The machine has a movable platform which may be raised and lowered so as to take care of any size or height of truck wheel now in use, and it is also of sufficient capacity for the widest single or dual truck tire. It is so arranged that when the blade finishes the cut, it is parallel with the felloe of the wheel and automatically stops just before striking the felloe. In approximately ten minutes' time the machine can cut a dual tire seventeen inches wide. (Racine Tool & Machine Co., Racine, Wisconsin.)

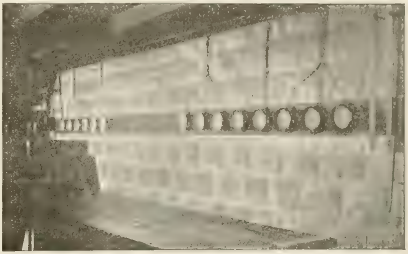
RECORDING THERMOMETERS FOR RUBBER VULCANIZERS.

Everywhere to-day manufacturers of rubber goods realize that temperature has a great effect on the chemistry of vulcanization, and that by watching and controlling it they can produce the best quality and reproduce it at will. Indeed, given the proper temperature, even an inferior grade of material can be used with the confidence of turning out a good product. So vital is the question of temperature that more vulcanizers than ever are being equipped with recording thermometers which give accurate information that forms the basis of all intelligent control.

Foxboro Recording Thermometer.

The accompanying illustrations shows a recording thermometer and an installation of fourteen of these on rubber vulcanizers at a large footwear plant in Massachusetts. The instruments, equipped with patented improvements, are of the inverted type and have variable lengths of lead-protected connecting tube and lead bulbs for protection against the fumes from the cure. These thermometers depend for their operation upon the pressure of a saturated vapor of a volatile liquid. They are so constructed as to take care of any temperature from plus-50 degrees to plus-400 degrees Fahrenheit, or the corresponding ranges in Centigrade or Réaumur. The charts have increasing graduations that make the upper or working portion of the scale clear and open, which is an advantage when close readings are a matter of vital importance.

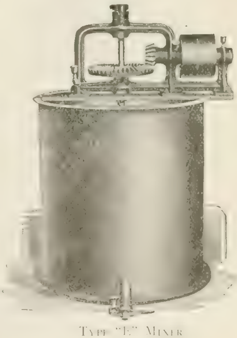
An automatic temperature controller which not only controls the temperature but also the duration of the heat may be supplied, thus making the curing of rubber independent of human conditions and eliminating all hand control. (The Foxboro Co., Inc., Foxboro, Massachusetts.)



Footwear Vulcanizer Equipped with Recording Thermometers.

VERTICAL CEMENT CHURNS.

Vertical cement churns are used in rubber mills when the making of certain solutions requires this particular type of mixer.



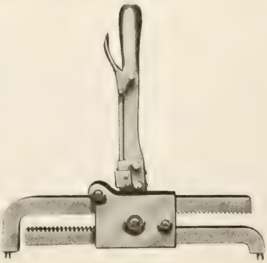
Type "E" Mixer

The machine here shown is supplied by the makers in three sizes, the steel tanks measuring, respectively, 24 by 24, 36 by 36, and 48 by 48 inches. They are all equipped with belt-driven agitators and gate valves for drawing off the solution.

While stock mixers are built with steel tanks, they are also furnished with wood tanks, vertical shafts and stirring devices made of wood for use in connection with materials that attack iron. (The Patterson Foundry & Machine Co., East Liverpool, Ohio.)

SECTIONAL TIRE CORE REMOVER.

The removal of sectional cores from tire casings after curing is facilitated by the ingenious device that is adjustable to any size core, and which is shown in the accompanying illustration.



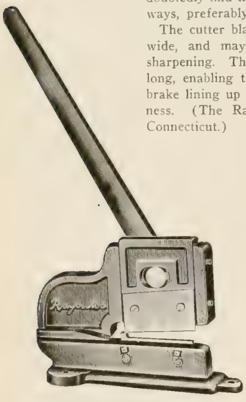
Core Puller.

Small holes in which the prongs of the puller are inserted may be drilled in the core sections, or the raised parts of the core may be gripped by the prongs that are operated by the hand-lever attachment. By means of this lever the sections are easily removed without kinking the tire beads. (Gillette Rubber Co., Eau Claire, Wisconsin.)

BRAKE LINING CUTTER.

This is a handy bench device that was primarily designed to cut brake linings and intended to be used by the dealer or garage man. In fact, the rubber manufacturer also could undoubtedly find this tool adaptable in many ways, preferably as a hand stock cutter.

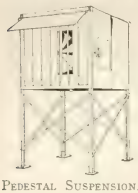
The cutter blade is of steel, 3½ inches wide, and may be easily removed for sharpening. The hand lever is 15 inches long, enabling the operator to cut easily brake lining up to one-half inch in thickness. (The Raybestos Co., Bridgeport, Connecticut.)



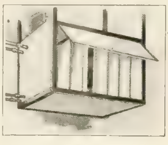
Raybestos Cutter.

ILGAIR UNIT SYSTEM OF HEATING.

The question of heating is of importance to every rubber manufacturer, and particularly so in view of the high cost of fuel. Direct heating requires numerous radiating surfaces, and blast heating with its long ducts and high-power blowers is costly. According to the present system each unit constitutes a separate heater, and both the volume and the distribution of the heat are controlled at one source.



Pedestal Suspension.



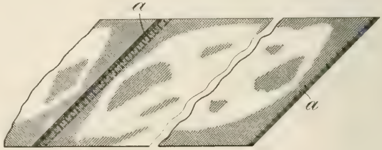
Ceiling Suspension.

This unit heater is a cabinet, open at both ends, containing a two-stack radiator and a motor propeller fan. The air is drawn in over the heated coils at about 1,000 feet per minute and discharged at about 2,500 feet per minute. Stationary deflectors spread the air in a horizontal plane, while a movable one controls the placement of the air, thus controlling the direction of the heat. As the air at the breathing line warms up, the deflector is raised and the air current straightens out to a distance of 50 to 60 feet, the low velocity precluding drafts or dust circulation on the floor. There are two different types—a pedestal model for floor installations and one for ceiling suspension. (Ilg Electric Ventilating Co., Whiting and Wells streets, Chicago, Illinois.)

MISCELLANEOUS PATENTS.

ELASTIC FABRIC FOR TIRE BUILDING.

For the purpose of at once avoiding waste and rendering elastic the splice formed by joining bias-cut strips of frictioned fabric for making tires and similar articles, the simple device of slitting the selvages of the fabric at frequent intervals



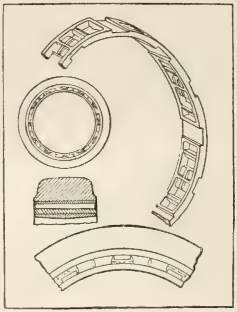
Tire Building Fabric.

has been patented. The result is that such a selvage edge bias splice is as elastic as any other portion, the joint is less bulky and all waste is eliminated. (Kurt W. Jappe, assignor to The Miller Rubber Co., both of Akron, Ohio. United States patent No. 1,318,876.)

MACHINERY PATENTS.

DEMOUNTABLE RIM FOR SOLID TIRES.

This is a detachable rim for solid tire wheels and may be applied to any wheel that has an ordinary turned rim intended to fit a pressed on tire but calls for a tire of a little larger diameter than that of the wheel. The space between the rim and the inside of the band of the tire is taken by an annular ring of steel or other cast metal which is wedged in place and thus holds the tire in position. The grooves for the wedges are spaced around the ring, being cut alternately on the outer and the inner surface; they taper in depth across the rim but their sides are parallel. Neither the rim of the wheel nor the inner circumference of the band tire is cut.



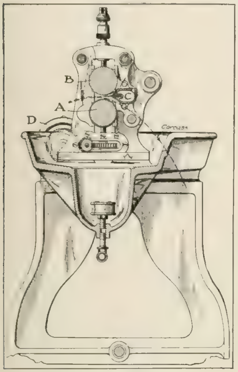
Solid Tire Demountable Rim.

The rim is turned internally so that it slides easily over the outer surface of the wheel rim; externally its dimensions allow the band tire to slip

easily into place. The wedges, which are made all of the same size, are then driven into place and may be fastened permanently by screws. (The Dunlop Rubber Co., Limited, and W. W. Haniell, 14 Regent street, Westminster, London, England, British patent No. 120,792.)

PNEUMATIC TIRE TREAD SLICING MACHINE.

In reclaiming scrap tires the tread is removed, prior to placing the carcass in the acid baths, by slicing off the tread by hand which results in uneven work and is a relatively costly operation. The machine here shown in sectional elevation severs the tread by action of a reciprocating knife and provides means for supplying water to facilitate the cutting operation.



Tire Tread Slicer.

The beads are first removed and the tire is fed between the rollers *A* and *B*, the center portion of the former being cut away to accommodate the bulge of the tire flattened between the rollers. The knife *C* reciprocates horizontally but is fixed vertically, consequently the upper roller *B* must be adjusted vertically until the correct thickness of the tread is gaged between the knife and the bottom periphery of the idler roller *B*. The vertical adjustment of the lower roller *A* is made by the hand-wheel *D*.

When power is applied, the knurled portions of the lower roller engage the inner surfaces of the tire side walls, drawing the tire between the rollers while the reciprocating knife slices the tread. A pump supplies a continuous flow of the cutting lubricant that collects in a sump, is strained and delivered to the pump line for reuse. (Edward Nall, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio. United States patent No. 1,319,301.)

OTHER MACHINERY PATENTS.

THE UNITED STATES.

No. 1,320,399. Tire mold. W. C. Lipe and A. G. Bolster, Syracuse, N. Y., assignors to The Fisk Rubber Co., Chicopee Falls, Mass.
1,320,728. Tire-head stripper. G. E. Blaylock, Baltimore, Md.
1,320,812. Vulcanizing apparatus for tires, with conveyor, etc. C. W. Wattleworth, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.
1,320,816. Collapsible core for tires. J. Yemiker, Akron, O.
1,321,228. Machine for cutting and rolling fabric. T. Midgley, Worthington, O., assignor to Morgan & Wright, Detroit, Mich.
1,321,229. Combined mold and fluid bag for tires. T. Midgley, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls—both in Massachusetts.
1,321,404. Ring core for building pneumatic cord tires with special cord arrangement. B. L. Stowe, Jersey City, N. J., assignor to Morgan & Wright, Detroit, Mich.
1,321,493. Fabric-laying attachment for tire-making machines. J. E. Thropp, assignor to The De Laski & Thropp Circular Woven Tire Co.—both of Trenton, N. J.
1,321,494. Fabric-laying attachment for tire-making machines. J. E. Thropp, assignor to The De Laski & Thropp Circular Woven Tire Co.—both of Trenton, N. J.
1,321,790. Fabric-stripping machine. C. D. Hibbs, Fort Worth, Tex.
1,321,961. Tire vulcanizer. H. K. Wheelock, assignor to Western Vulcanizer Manufacturing Co., a copartnership consisting of H. K. Wheelock, F. A. Weller, and W. R. Fontaine—all of Chicago, Ill.
1,322,196. Device for inflating and indicating pressure in tires. O. H. Meyers, Dudley, Ill.
1,322,464. Hose-making machine. J. M. Oden, Brooklyn, N. Y.
1,322,944. Mandrel for tube winding. J. F. Pierce, Glynrich, assignor to American Vulcanized Fibre Co.—both of Wilmington, Del.
1,323,164. Collapsible core for tires. P. and B. De Mattia, Clifton, N. J.
1,323,165. Collapsible core and chuck for tires. P. and B. De Mattia, Clifton, N. J.
1,323,213. Rubber working machine. G. W. Bulley, Chicago, Ill.

THE DOMINION OF CANADA.

194,070. Apparatus for building tires. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of T. Midgley, Worthington, O., U. S. A.
194,071. Footwear-last connections, etc. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of A. D. Warner, Mishawaka, Ind., U. S. A.

NEW ZEALAND.

42,098. Machine for shaping tire fabric on revoluble core. J. D. Thomson, 377 Buckingham street, Akron, O., U. S. A.

PROCESS PATENTS.

THE UNITED STATES.

No. 1,321,223. Manufacture of strand fabric and covering webs. M. A. Marquette, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls—both in Massachusetts.
1,321,402. Manufacture of pneumatic tires by doubling cords backward and forward upon themselves, etc. B. L. Stowe, Jersey City, N. J., assignor to Morgan & Wright, Detroit, Mich.
1,322,614. Manufacture of dress shields. Le R. H. Rand, Brooklyn, N. Y.
1,322,843. Manufacture of rubber rings, etc. H. E. Townsend, assignor to Anchor Cap & Closure Corp.—both of Brooklyn, N. Y.

THE DOMINION OF CANADA.

194,043. Formation of seamless air-tight inner tubes. H. B. Wallace, St. Louis, Miss., U. S. A.
194,113. Manufacture of pneumatic tire casings. J. M. Gilbert, New York City, assignee of F. B. Carlisle, Davisville, R. I.—both in U. S. A.

NEW ZEALAND.

42,078. Retreading tires. S. H. Goldberg, 1918 Prairie avenue, Chicago, Ill., U. S. A.
42,276. Retreading tires. S. H. Goldberg, 1918 Prairie avenue, Chicago, Ill., U. S. A.

RUBBER-MAKERS' CRAYON.

While it would seem at first thought that any sort of marking crayon would be adaptable to rubber workers' use, it is, in practice, quite to the contrary. The fact is, a high-grade wax

"Supermark" Crayon.

crayon with unusual lasting qualities is required and one that can be efficiently used for marking hot or cold rubber sheets, molds, cores, etc.

The crayon here pictured may be obtained in the four following colors: black, yellow, blue, and red. (Zelnicker Crayon Works, St. Louis, Missouri.)

ACCESSORY MANFACTURERS AT THE TRACTOR SHOW.

Arrangements have been made with the Kansas City Tractor Club whereby members of the Motor and Accessory Manufacturers' Association are to participate in the Fifth Annual Tractor Show to be held in Kansas City from February 16 to 21, inclusive, 1920. Applications and diagrams will be forwarded to members shortly, and indications point to a large and representative number of exhibitors.

The following are the shows sanctioned by the Motor and Accessory Manufacturers' Association:

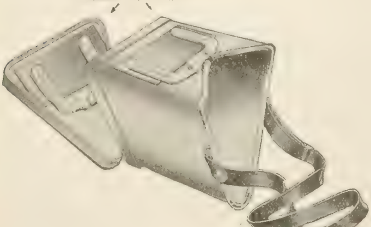
New York (both passenger and truck shows) Jan. 3-10.
Chicago (both passenger and truck shows) Jan. 24-30.
Minneapolis—January 31-February 7.
Kansas City—February 16-21.
Boston—March 13-20.

This is the largest number of shows ever sanctioned by the Association for any one year. Applications for space already received for the New York, Chicago and Boston shows are exceeding all previous records, both in the number of exhibitors and the amount of space applied for. It is expected that this will also hold true of the Minneapolis and Kansas City shows.

New Goods and Specialties.

AN INHALER WITH RUBBER VALVES.

A device intended for use with a remedy to relieve by inhalation diseased conditions of the air passages, et cetera, is illustrated below. It is made of metal and has a strap to hold it in place over the nose, the strap passing



Max Heil[illegible] Automatic Inhaler.

around the head. Provision is made for the application of a cleansing antiseptic to absorbent material stored within the inhaler, which can be renewed frequently. Two rubber valves form the automatic feature of the inhaler, one of these permitting the inhalation of fresh air, which the inhaler filters and medicates, and the other, the exhalation of the gases formed by breathing. This inhaler may be worn when awake or asleep. (Frederick Heilman Co., 138 Market street, Johnstown, Pennsylvania.)

A NEW CORD TIRE SOLE.

A cord tire sole made from new live rubber and usual standard cord tire fabric is shown in section in the accompanying illustration. It fits over all sizes of cord tires and is held in place by a specially prepared cold-cure self-vulcanizing cement which causes the tire sole to become an integral part of the tire. In applying, the selected worn casing is properly prepared by buffing off the surface until it is clean. Then the tire sole is placed entirely over it and cemented to it. The tire is then held to the rim by inflation in the usual manner. This particular tire sole is patented and the inventor has put the accessory on the market with a "no limit mileage guarantee." (Sturges Tire & Rubber Co., Oakland, California.)

Sturges [illegible]

TRANSPARENT TOBACCO POUCHES.

What is said to be a popular article in England is a transparent rubber tobacco pouch, some of which are red. Being transparent, these pouches enable the user to note the amount of contents. ("The India-Rubber Journal.")

A BRITISH MOTOR WATERPROOF.

A new waterproof outfit for motoring, which was shown at the English motorcycle show, recently held at Olympia, is described as follows in "The India-Rubber Journal," London:

"Double-breasted jacket, a garment shaped to the figure, having two expanding panels, two skirt vents, and deep pouch or bellows-shaped pockets besides an outside breast pocket; worn with a wide-fitting seatless trouser."

AN ATTACHMENT FOR PENCILS, ETC.

An attachment device to facilitate the gripping of penholders, pencils, and other similar articles consists of a soft rubber sleeve which, because it is rubber, is adaptable to pencils or penholders of different diameter. There are longtudinal slits which facilitate adjustment and use. This device has been patented in the United States. (M. J. McGuigan, Ashland, Wisconsin.)

[illegible] Sleeve for Pencils

"TIRE LIFE."

A new compound intended to be used as a preservative of all kinds of rubber goods, including belting, hose, valves, valve seats, gaskets, packing, matting, rubber boots, overshoes, etc., and particularly tires is called "Tire Life." It is applied with an ordinary paint brush after the articles have been first washed and dried. (Camphuis, Rives & Gordon, Inc., 81 New street, New York City.)

Mason Truck Cord Tire

A TRUCK CORD TIRE.

The growing popularity of cord tires of the pneumatic type for use on trucks and other heavy motor vehicles is responsible for many manufacturers of other tires going into the manufacture of this particular type. The accompanying illustration shows the tread design of one of the new pneumatic truck cord tires. (The Mason Tire & Rubber Co., Kent, Ohio.)

THE "TRIANGLE TREAD" CORD TIRE.

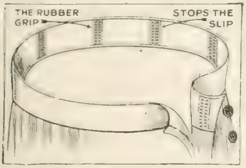
Another cord tire of pleasing design is known as the "Triangle Tread." The well-known resiliency of the cord tire is produced by the method of construction whereby rubber-coated cords are embedded in rubber without the fabric construction so familiar in the older type of tires. Additional resiliency with less inflation is provided by the cord tire.

Gordon "Triangle Tread."

The tread design of a tire is intended to make it grip the road surface firmly and without the disagreeable and dangerous slipping which automobilists so greatly dislike in tires upon which they depend to give them the maximum of service and safety. (The Gordon Tire & Rubber Co., Canton, Ohio.)

A BELT WITH A GRIP.

A belting intended for wear with ladies' skirts is made in the usual way, but has incorporated in it a flexible boning that adds to its rigidity and at the same time permits it to yield freely to the movement of the body. Over each bone is a strip of rubber fabric containing a number of rubber grips which, when brought in contact with the garment, keep it in position. This belting worn with shirtwaist and skirt, keeps the waist down as well as holding the skirt up. The invention can be washed and boiled, the manufacturer claims, without losing any of its shape or rigidity. The "Gripfast" belting is put up on reels containing twelve yards and is packed one reel to the box. The idea is patented. (David Basch, 23-25 East 21st street, New York City.)



"Gripfast" Skirt Belting.

"NITREX."

A substance to prevent the oxidation of tires and the accumulation of rust on tire rims has been developed under the trade name "Nitrex." It is intended especially for painting spare tires, is applied with a brush, and dries instantly. It produces a jet-black, brilliant surface, but comes off when the tire is put into use, leaving the spare like the other tires in appearance. (The Sterling Varnish Co., Pittsburgh, Pennsylvania.)


Squeegee Heel.

ANOTHER NON-SKID HEEL.

A rubber heel embodying the popular non-skid element employs a series of V-crimps as the patented feature in accomplishing its purpose. It is claimed by the manufacturer that these heels will prevent slipping on wet or greasy pavements and ice and snow. The V-crimps, it is said, grip the pavement securely until the foot is released for the next step. A similar construction has been used by some English designers in constructing rubber heels, the V-cuts being disposed at varying angles to produce different designs. (The Squeegee Heel Co., Elyria, Ohio.)


The "Disteel" Wheel.

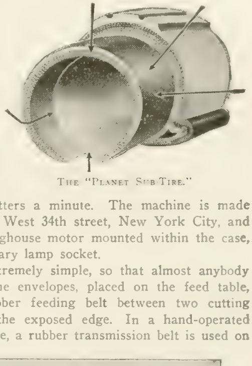
ATTRACTIVE WHEELS.

Simplicity of design in any article makes for elegance. The wheel shown here has not only simplicity of design but of construction likewise, and the result is pleasing.

The claim made by the manufacturer is that these wheels are strong and very light, being proportionately lighter on heavy cars than the ordinary wheel equipment. They likewise facilitate the changing of both wheels and tires. (Detroit Pressed Steel Co., 1802 Mt. Elliott avenue, Detroit, Mich.)

"A TIRE WITHIN A TIRE."

An inner tire made of first-class fabric and rubber tends to prevent punctures, blow-outs, rim cuts, etc., in the tires with which it is used. In the three and three and one-half inch sizes it is made with three layers of new fourteen-ounce fabric, while the four-inch and larger sizes have four layers. The outside is a coat of soft cushion rubber to prevent stone bruises, and is roughened to prevent friction. This, the manufacturer claims, tends to prevent the creation of heat inside the casing because the "Planet Sub-Tire" does not slip. No cement is required or used to keep this inner tube in place. (Planet Rubber Co., 125 East Ninth street, Los Angeles, California.)


The "Planet Sub-Tire."

"LIGHTNING" LETTER-OPENER.

An electrically operated letter-opener handles five hundred letters a minute. The machine is made by the Bircher Co., 110 West 34th street, New York City, and is operated by a Westinghouse motor mounted within the case, connected with an ordinary lamp socket.

The mechanism is extremely simple, so that almost anybody can use the device. The envelopes, placed on the feed table, are conveyed by a rubber feeding belt between two cutting knives, which clip off the exposed edge. In a hand-operated machine of the same type, a rubber transmission belt is used on the driving pulley. (Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania.)


"Lightning" Letter Opener.

A CURLING SHOE.

The manufacture of footwear is specialized more and more each year. One of the winter sports, more popular in Canada than in the United States, is curling, a game played on smooth ice, and therefore requiring the contestants to wear warm and anti-slip footwear. The shoe here shown is of black cashmerette, with heavy heel, semi-double sole, and high strong foxing. It is lined with felt and is worn not as an overshoe but as a shoe, with a heavy stocking. (The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec.)


"Neptune" Curling Shoe.

Activities of the Rubber Association of America.

THE DIVISION MEETINGS of The Rubber Association of America held during December were devoted to routine matters and the business necessary in anticipation of the annual elections to be held early in January.

Active preparations are being made for the coming annual meetings and the 20th annual dinner of the Association, that will undoubtedly be the largest and most representative gathering of rubber men known to rubber history.

STATISTICS OF THE RUBBER INDUSTRY.

NEW YORK, December 16, 1919.

To all manufacturers of rubber products and reclaimed rubber:

There is enclosed an analysis of the statistics compiled from the returns to Questionnaire No. 100 covering the total average daily number of employes, total sales value of production and classified consumption of crude rubber, during the year 1918.

This data is sent you with a new Questionnaire, No. 101, enclosed with my letter of this date, as a report to which our members are entitled by reason of their support in supplying statistics for individual companies, from which this compilation of totals was made.

ANALYSIS OF STATISTICS COMPILED FROM QUESTIONNAIRE NO. 100.

AVERAGE TOTAL DAILY NUMBER OF EMPLOYES.

1917			1918.	425 Manufacturers.			
103 Manufacturers. Actual Reported Total.	452 Manufacturers Actual Reported Total.	Percentage Relation of Total 103 Mfrs. to Total 452 Mfrs.	103 Manufacturers. Actual Reported Total Same Mfrs. as Reported 1917.	Actual Reported Total	Estimated Total	Decrease 1918 Under 1917.	Per cent of Decrease.
151,078	207,714	73	148,787	None	203 813 (See Note)	3,896	1.88

NOTE.—Obtained by applying percentage (73%—which total of 103 manufacturers bore to total of 452 manufacturers in 1917) to figures reported by same 103 manufacturers for 1918, viz., 148,787

SALES VALUE OF TOTAL PRODUCTION.

1917.			1918.	452 Manufacturers.			
103 Manufacturers. Actual Reported Value	452 Manufacturers. Actual Reported Value.	Percentage Relation of Total 103 Mfrs. to Total 452 Mfrs.	103 Manufacturers. Actual Reported Value Same Mfrs. as Reported 1917.	Actual Reported Value.	Estimated Value.	Increase 1918 Over 1917.	Per Cent of Increase.
$654,948,376	$895,816,248	73	$819,159,105	None	$1,122,135,760 (See note)	$226,319,512	26.4

NOTE.—Obtained by applying percentage (73% which total of 103 manufacturers bore to total of 452 manufacturers in 1917) to figures reported by same 103 manufacturers for 1918, viz., $819,159,105.

POUNDS OF CRUDE RUBBER USED.

Products	1917.	Estimated for 1918.	Per cent of Increase 1918 over 1917.	Per cent of Decrease 1918 under 1917.	Per cent to total 1918	Per cent to total 1917.
Casings under 6 inches	162,643,482	140,021,023	.....	13.91	43.40	53.13
Tubes under 6 inches	35,704,446	32,902,135	.....	7.85	10.20	11.67
Solid tires	25,055,673	50,024,166	99.65	.....	15.51	8.19
Other tires and tire sundries	9,983,195	14,221,023	42.44	.....	4.41	3.26
Tires, totals	233,386,796	237,168,347	1.62	.....	73.52	76.25
Mechanical goods	21,857,385	22,101,528	1.12	.....	6.85	7.14
Boots and shoes	26,823,689	31,468,843	17.32	.....	9.75	8.76
Other products	24,045,782	31,867,887	32.53	.....	9.88	7.85
Grand totals	306,113,652	322,606.605	5 39	.....	100.00	100.00

It is being distributed, however, regardless of whether or not a response to Questionnaire No. 100 was made by your company, but it is to be understood that, beginning with the enclosed Questionnaire No. 101, a compilation of the statistics will be sent only to those companies who furnish the data called for.

A. L. VILES, General Manager.

QUESTIONNAIRE NO. 101.

NEW YORK, December 17, 1919.

To all manufacturers of rubber products and reclaimed rubber:

In furtherance of the plan for collecting basic figures regarding the rubber industry, submittd to you by your directors on March 24, 1919, and approved by the membership through their favorable replies to the letter of that date, we are submitting herewith Questionnaire 101, covering the first half of the year 1919.

It is intended that a questionnaire similar to No. 101 (submitted herewith) will be sent out every six months. This questionnaire has been carefully prepared in order to reduce to a minimum the information desired, but at the same time to provide the basis for a comprehensive picture of the whole industry. In designing the questionnaire, your directors and their special committee on statistics have had in mind the desirability of accumulating every half-year the sort of information which is now collected every five years by the Government in the Census of Manufactures, so that we shall have at all times recently collected statistics which will indicate the size and importance of our industry.

The desirability of there being available statistics which accurately reflect conditions in the rubber industry and the relation of that industry to the commerce of the country is very pronounced in connection with work such as that which will be undertaken by a special joint legislative committee, comprising several factors in the automotive industry, at the instance of the Tire Divisions of this Association, with the approval of the Executive Committee. The enactment of Federal and State legislation which in any way concerns the interest of our tire manufacturers is to be carefully watched, with a view to make it possible to keep abreast of developments of this kind, and in this connection the statistics which are to be secured by questionnaires, such as the enclosed, will doubtless be of inestimable value.

The traffic and transportation interests of our members is given a great deal of attention by the Traffic Committee of the Association which knows, from much experience in dealing with the Railroad Administration and the officers of the individual carriers prior to Federal control, that if the rubber industry, through this Association, is able to produce accurate and comprehensive data concerning the industry in support of or in opposition to contemplated railroad legislation with respect to rates, rules, classification, etc., the influence thus brought to bear through the presentation of facts and figures is a very valuable factor in the strengthening of the position of the rubber industry.

Arrangements have been completed whereby the Guaranty Trust Company of New York will serve as the statistical agent of The Rubber Association in collecting the data requested in The Rubber Association questionnaires. These questionnaires are to be returned to the Guaranty Trust Company of New York, which then consolidates the individual returns, and submits the *total figures only* to The Rubber Association, together with a list of the firm members who have cooperated in making the total figures possible. The *total figures only* will be published by the Rubber Association, and will be sent only to the firm members who have made returns for their companies.

The Guaranty Trust Company will use all possible caution to insure secrecy for the individual returns which it receives, and manufacturers can make these returns with entire confidence

that only *total figures for the entire industry* will be published and that no one except carefully selected employes of the Guaranty Trust Company will have access to the individual returns.

Your Board of Directors believes that if a little thought is given to this matter along the lines of the foregoing it will become apparent to you that the collection and compilation of the statistics asked for is very much to be desired and that we shall accordingly be favored with a prompt and complete response for your company.

A stamped envelope addressed to the Guaranty Trust Company, to whom the enclosed questionnaire is to be returned, is sent you herewith for your convenience.

A. L. Viles, General Manager.

INDUSTRIAL RELATIONS COMMITTEE.

New York, December 26, 1919.

To firm members:

It is believed by the Association's executives that nearly all manufacturers fully realize the unusual and radical changes that have taken place with respect to the relation of employer and employe, these changes being particularly emphasized by the conditions arising during the war.

The war period created a demand for many special products and increased greatly the need for staple articles of utility. For these reasons a premium was placed on the labor required for such unprecedented production.

The unusual demands for labor of all kinds which accompanied production requirements soon led to wage adjustments and many radical changes in working conditions to the extent that nearly all the pre-war standards of employment were completely overturned and employers and employes obtained the new viewpoint required under such changed conditions.

On account of these conditions there seemed to be a desire for a helpful medium in the Association through which discussion and exchange of ideas might be had regarding industrial relations.

At a meeting of the Executive Committee of the Association, held on September 26, considerable discussion was devoted to the desirability of appointing an Industrial Relations Committee, which resulted in President Sawyer's consenting to investigate the situation with a view to placing a definite proposal before the Executive Committee at a future meeting.

Mr. Sawyer was aided in his investigation by directors and superintendents of labor, also factory managers, serving as a temporary committee, representing all of the various rubber manufacturing districts or centers, and the information brought forth by this investigation indicated clearly that much benefit might result from the formation of an Industrial Relations Committee.

At the Executive Committee meeting of December 5, it was definitely decided to form an Industrial Relations Committee along lines similar to the Association's traffic organization and that the total membership of the committee should not exceed twenty-five, ten of which should constitute an Executive Relations Committee.

It was further decided that the committee should be appointed with full consideration for territorial representation. Consequently, there were selected four representatives from Akron, one from Trenton, one from Canada, three from New York and New England and one from the Middle West, as follows, to constitute an Executive Industrial Relations Committee.

AKRON.

J. W. Thomas, Firestone Tire & Rubber Co.
C. Jahant, General Tire & Rubber Co.
M. A. Flynn, The B. F. Goodrich Rubber Co.
William Stephens, The Goodyear Tire & Rubber Co.

TRENTON.

C. H. Oakley, Essex Rubber Co.

CANADA.

D. E. Beynon, Dunlop Tire & Rubber Goods Co., Ltd.

NEW YORK and NEW ENGLAND.

H. T. Martin, The Fisk Rubber Co.
H. L. Baxter, Hood Rubber Co.
C. S. Ching, United States Rubber Co.

MIDDLE WEST.

Members of the Association in the middle western territory have been asked to select their representatives, but we have not yet received definite advices.

The Executive Committee of the Association decided that the Executive Industrial Relations Committee shall recommend the additional fifteen members who, with the ten executives, shall make up a committee of twenty-five, and it is expected that the recommendations shall recognize the idea of territorial representation in the same manner as in the selection of the Executive Industrial Relations Committee.

It is expected that the Industrial Relations Committee shall first endeavor to analyze the methods now being used in the rubber industry with respect to fundamental relations between employer and employe, including the organization of factory personnel or employment departments, the selection and assignment of new employes, the medium of contact between employer and employe, factory working conditions, health, sanitation, welfare, training of foremen, and probably, wages.

It is further expected that following the analysis and exchange of ideas respecting the fundamental conditions referred to in the foregoing, the committee shall convey to the membership information and recommendations embodying the best features of the various plans analyzed.

It is hoped that the work of this committee shall become a constructive and useful factor in association work, and also that all members shall assist the work by presenting through this office subjects or problems for analysis and discussion at the committee meetings.

A. L. Viles, General Manager.

INDUSTRIAL RELATIONS COMMITTEE MEETS.

New York, December 26, 1919.

To firm members:

The first regular meeting of the Executive Industrial Relations Committee was held at this office on December 12. The election of officers for the year 1920 was first given attention and the following members of the committee were unanimously elected to the respective positions: C. S. Ching, chairman; H. L. Baxter, 1st vice-chairman; C. H. Oakley, 2nd vice-chairman.

After the election of officers, the entire day was given to a discussion as to the information needed from firm member manufacturers respecting the present personnel or employment organizations, this discussion being predicated on the committee's conclusion that, undoubtedly, every employer in the rubber industry desires to make adequate provision for efficient supervision of the relation between employer and employe.

It was the further conclusion of the committee that the five fundamental features of the employment or industrial relation are as follows:

1. Employment, 2. Health,
3. Safety and sanitation, 4. Training of foremen,
5. General service.

In order that the committee may give consideration to the methods that may be productive of the greatest degree of efficiency, it desires to secure from each manufacturing firm member detail information respecting the organization now in existence at each plant for handling this work.

It is hoped that firm members will find it convenient to send the desired information to this office as early as possible in order that the committee may proceed with the work of analysis of the various methods employed. The committee wishes to emphasize that each firm member will ultimately receive the benefit of a comprehensive plan predicated on the best that can be drawn from individual methods and practices and the recommendations or plans submitted by the committee will be compiled in chart form in such manner as to be flexible and easily adapted to large or small organizations.

A. L. Viles, General Manager.

MEETING OF THE SCRAP RUBBER DIVISION.

At the meeting of the Scrap Rubber Division of the National Association of Waste Material Dealers held at the Hotel Astor, New York City, on December 9, the former chairman, Herman Muehlstein, was reelected to serve for the balance of the present fiscal year. In view of the limited attendance of scrap rubber members, no matters of importance were considered for the reason that it is planned to hold a meeting of that division early in January.

NEW YORK RUBBER EXCHANGE.

The delayed publication of this issue, due to the printers' strike, permits the announcement of the organization by the New York Rubber Trade Association, of a crude rubber exchange to serve as a market for dealing in futures along the lines of other market exchanges. The price of a seat is to be $1,000.

The Obituary Record.

DEAN OF SHOE TRADE JOURNALISM.

GEORGE E. B. PUTNAM, dean of shoe and leather journalists of Boston, died of apoplexy at his home in Newton Centre early on the morning of December 11, 1919, aged 67 years. For thirty-two years Mr. Putnam had been connected with the editorial staff of the "Boot and Shoe Recorder," four years as editor, and was affectionately known as the "encyclopedia" of the staff. He was an authority on footwear matters and the historian of the shoe trades. He was a very prolific writer, and veterans of the trade still quote his "shop tales" in early issues of the "Recorder," and recall the tone and timeliness of his news letters and market reports.

GEO. E. B. PUTNAM.

Early in his editorial career he perfected his knowledge of merchandising by extensive travel in practically every State in the Union, and hundreds of footwear men may remember his pilgrimages of a quarter of a century ago. His trips to Central and South America, the West Indies, Canada and other sections of the Western Hemisphere to study foreign trade extension for the benefit of manufacturers of shoes and rubbers desiring export business, supplied the material for numerous illustrated travelog lectures of interest and charm.

About nine years ago Mr. Putnam relinquished his editorship of the "Recorder," but continued as an associate editor, writing weekly "The Leather Market" and "The Rubber Realm," which had been popular features of the paper for many years. Turning to rubber research work some five years ago, he joined the editorial staff of THE INDIA RUBBER WORLD, and became its Boston correspondent, directory and biographical writer, and librarian, a position which he filled with rare faithfulness.

George Edwin Ballard Putnam, a descendant of the famous Putnams of Revolutionary days, was born in Boston, Massachusetts, December 29, 1851. He attended the Quincy School, and was graduated from the English High School in 1869, being awarded the Franklin Medal for distinguished scholarship. For a time he engaged in the directory business, but gradually drifted into amateur journalism and writing for the trade press. "The Youth's Companion," in the old days when Mr. Ford, its founder, was alive, numbered him on its editorial staff.

Mr. Putnam was a member of the Old Boston Schoolboys' Association, and at one time president of the English High School Class of 1869 Association. Being among the earliest amateur journalists, he became one of the founders of "The Fossils," a New York City club composed of former publishers of amateur papers throughout the country. He was a member of Dalhousie Lodge, A. F. and A. M., of Newtonville, Massachusetts, also of the Boston Shoe Trades Club, and had not missed a single meeting of the Boston Boot and Shoe Club until the session on the evening of December 10, only twelve hours previous to his death. Prominent in church work, he had for the past seven years officiated as a deacon of the First Baptist Church, Newton Centre, Massachusetts.

Every branch of the Boston footwear, rubber and leather trades, and the publications dealing with these industries, joined in honoring his memory at the funeral, which was held in the First Baptist Church at Newton Centre. In the gathering were representatives of the Rubber Club of America, the Boston Boot and Shoe Club, the Boston Shoe Trades Club and the Dalhousie Lodge of Masons. Rev. Charles N. Arbuckle, pastor of the parish, conducted the service, and also read prayers at the family home at 16 Elmore street, Newton Centre. The interment was in Forest Hills Cemetery.

The bearers were: Oscar Blaisdell, of the G. W. Armstrong News Co.; Charles H. Clark, Master of Dalhousie Lodge; Henry H. Kendall, a deacon of the Newton Centre Baptist Church; George W. R. Hill, vice-president of the "Boot and Shoe Recorder"; Arthur D. Anderson, editor of the "Boot and Shoe Recorder"; Harry Olsen, editor of the "Export Recorder"; James H. Stone, manager of the "Shoe Retailer," and Phil M. Riley, of the editorial staff of THE INDIA RUBBER WORLD.

One of those rare gentlemen of the old school, Mr. Putnam closed his Book of Life with that quiet calmness that had characterized his serene and happy, though withal very busy, life. He was a patriotic, clean American, lovable and widely loved. Thinking ill of no man, he embittered none and made a friend of everybody he met. No one ever heard a profane word from his lips. A familiar and a popular speaker at thousands of local and national rubber and shoe trade gatherings, he was "Colonel" Putnam or "G. E. B. P." in affectionate daily greetings. His faithfulness, fairness, integrity and ever ready spirit of helpfulness was an inspiration to his associates, who mourn his loss and by whom he will long be remembered.

He is survived by his widow, Ellen H. Putnam; a son, Russell B. Putnam, of Waterbury, Connecticut, and a daughter, Mrs. Harry B. Chesley, of East Sumner, Maine.

PROMINENT IN THE WIRE INDUSTRY.

William Ellis Rice, one of the pioneers in the New England wire industry, died December 12, 1919, at his home in Worcester, Massachusetts, aged nearly 87.

As a boy of 18 he entered the employ of Ichabod Washburn & Co., wire drawers and finishers. Seven years afterwards he took a partner and entered the business, first in Connecticut and later building a model plant, for that period, at Holyoke, Massachusetts. In 1865, at the solicitation of Ichabod Washburn, the business was joined with the Washburn & Moen Wire Works, afterwards the Washburn & Moen Manufacturing Co., Mr. Rice becoming a director and later an executive officer. He introduced in this country the continuous rod rolling system, and later was the first American to import Swedish iron. In 1891, as president of the Worcester Wire Co., and of the Washburn & Moen Manufacturing Co., he effected the sale of the two corporations to the American Steel & Wire Co., after which he retired from business.

Mr. Rice held membership in the Union Club of Boston, the Worcester Boys' Club, Worcester Society of Antiquity, Tatnuck Country Club, Worcester Art Museum, Worcester Art Society, Worcester Club, Worcester Continentals, Worcester Board of Trade and the Home Club of Worcester. He leaves his widow, one son, and one daughter.

R. E. WRIGHT, EUROPEAN MANAGER FOR THE I. B. KLEINERT Rubber Co., was taken suddenly ill in London in returning from a business trip on the Continent and died of a stroke in the latter part of November.

MRS. AUGUSTA NEIDNER, WHO DIED EARLY IN NOVEMBER IN MALden, Massachusetts, at the age of 85 years, was the widow of Charles H. Neidner, who came to this country from Saxony in

1863 and in 1893 established the linen fire hose business now carried on by his three sons, under the name of Chas. Neidner's Sons Co. Mr. Neidner died in 1908. Mrs. Neidner was also born in Saxony and came to this country with her husband 44 years ago. Three sons and two daughters survive her.

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

(766.) A reader requests the addresses of manufacturers of wiring machines for applying baby-carriage tires.

(767.) An inquiry has been received for the address of manufacturers of tire wrapping tape, who might have seconds for sale.

(768.) A reader asks for the addresses of manufacturers of rebuilt tires, particularly of the "Popular" and "Leader" brands.

(769.) Request is made for the addresses of manufacturers of rosin spirit who will quote prices and send samples abroad.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Request for each address should be on a separate sheet, and state number.

DISTRICT OFFICES.	COOPERATIVE OFFICES.
New York: 734 Customhouse.	Cleveland: Chamber of Commerce.
Boston: 1801 Customhouse.	Cincinnati: Chamber of Commerce; General Freight Agent, Southern Railway, 96 Ingalls Building.
Chicago: 504 Federal Building.	Los Angeles: Chamber of Commerce.
St. Louis: 402 Third National Bank Building.	Philadelphia: Chamber of Commerce.
New Orleans: 1020 Hibernia Bank Building.	Portland, Oregon: Chamber of Commerce.
San Francisco: 307 Customhouse.	Dayton, Ohio: Dayton Chamber of Commerce.
Seattle: 848 Henry Building.	

(31,412.) Agency desired by a firm in the Netherlands for tires.

(31,427.) A firm in Persia desires to connect with manufacturers of overshoes and rubber goods. Asks that quotations be accompanied by catalogs and samples, and, if possible, freight rates to Bagdad. Payment 25 per cent when goods are shipped and balance through bank in Persia.

(31,434.) Representative of a firm in Mexico wishes agency from manufacturers for the sale of rubber tires.

(31,440.) A merchant in the Netherlands desires agencies for the sale of rubber goods, such as hose, sheeting, hospital cloth and gloves.

(31,441.) A man in France wishes an agency on a commission basis for the sale of rubber thread for elastic fabrics. Correspondence may be in English.

(31,444.) Commercial agent from Venezuela is in the United States to secure an agency for the sale of elastic material used for suspenders, garters, and notions.

(31,450.) A firm in Greece wishes an agency for the sale of rain coats.

(31,451.) A broker in Italy wishes an agency for the sale of tires, accessories and rubber goods. Correspondence may be in English.

(31,452.) A company in the Canary Islands desires an agency to sell rubber articles. Quotations, c.i.f. the Canaries via Liverpool. Terms 30 days sight up to 60 days, usually granted to purchasers. Correspondence must be in Spanish.

(31,470.) A firm in Belgium wishes an agency for the sale of accessories, tires. Quotations should be c.i.f. Antwerp. Payment, cash. Correspondence and catalogs in French.

(31,499.) A business woman in Belgium, who knows the shoe trade, wants an agency for the sale of rubber overshoes and kindred articles. Quotations c.i.f. Antwerp. Correspondence and catalogs in French.

(31,501.) American firm of exporters wishes to establish in Poland and other European countries permanent agencies for the sale of rubber goods.

(31,503.) American exporters have established agencies in all the chief agencies of the Levant and wish to represent American firms for the sale of automobile accessories.

(31,505.) A manufacturing firm in Belgium wishes agencies for rubber and asbestos packings, India rubber goods and steam packing, especially black india rubber packing. Quotations c.i.f. Antwerp or Brussels. Payment, cash. Correspondence may be in English.

(31,511.) American export firm sending representative to England wishes agency for sale of rubber boots, overshoes, etc. Quotations requested.

(31,520.) Purchasing agent for British importing house wishes agency and to purchase automobile tires, for sale in Czecho-Slovakia, Holland, Spain and Italy. Quote f. o. b. New York.

(31,522.) A firm in Spain wishes to purchase rubber of all kinds for footballs. Correspondence should be in Spanish.

(31,528.) A man in Switzerland wishes agency for sale of tires. Correspondence in French or German.

(31,529.) Agent in the United States of a firm in Finland wishes to purchase rubber goods and belting. Quotations f.a.s. New York. Payment, letter of credit through bank in New York.

(31,532.) A commercial representative in France wants an agency to sell medical and surgical articles in ebonite and rubber. Quotations c.i.f. French port. Correspondence may be in English.

(31,561.) Purchasing agent of firms in France wishes to get in touch with manufacturers of rubber goods.

(31,566.) A firm in Portugal desires to secure an agency for automobile accessories, including tires. Correspondence in English.

(31,614.) Commercial agent in Bulgaria wishes to buy large quantities of rubber shoes. Correspondence may be in English.

(31,618.) Commercial agent in Belgium wishes to buy raincoats. Quotations c. i. f. Antwerp. Correspondence and catalogs in French.

CUSTOMS APPRAISER'S DECISIONS.

No. 38211.—Reappraisement 95726, etc., of Goodyear Tire and Rubber Company, (New York).

AUTOMOBILE TIRES.—Tires entered at Buffalo and Chicago by the Goodyear Tire & Rubber Co. of Canada were appraised for duty at the price charged to dealers. The company has three scales of prices for its tires, one for export and for manufacturers of automobiles, a second for sales to jobbers and a third for sales to dealers. G. A. McClelland held that although the company restricted the methods of selling, there was a wholesale price for the tires in Canada and appraisers were right in levying duty on basis of the price to dealers. (Treasury Decisions, Volume 37, No. 24.)

Protest 851,995-3263 overruled. No. 38207.—United States *vs.* National Gum & Mica Co. (No. 1991) United States Court of Customs Appeals. Appeal from Board of United States General Appraisers, Abstract 43,118.

GUM KARAYA.—Assessed at 10 per cent ad valorem under paragraph 385 of the tariff Act of 1913. Free entry claimed under paragraph 513 as crude rubber, or under paragraph 552 as a crude vegetable substance. Three other protests, but not this one, claimed free entry as a crude drug under paragraph 477. A board heard the four protests and granted the appeal on the ground that gum Karaya was a crude drug. The court, Martin, J., delivering the opinion, modifies the decision by excluding appellee from its effect, as he had not put in the crude gum plea. (Treasury Decisions, Volume 37, No. 23, November 25, 1919). (I. R. W., Oct. 1919, p. 10; Sept. 1919, p. 700).

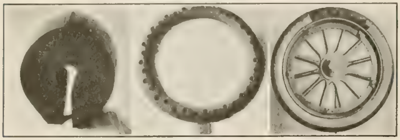
INTERESTING LETTERS FROM OUR READERS.

MAKES THE TIRE PERFECT?

To The Editor:

DEAR SIR:—The perfect tire is here, at least I think so. That is a rather bold statement to make, but in view of the facts, the writer feels safe in such affirmation.

The Security No-Air Tube



Cross Section. Arrangement of Suction Cups. Tube in Place.

With the tire tube shown in the illustration a blow-out is an impossibility for the reason that there is no air in the tube to blow out. Also the construction is perfect. It mechanically embodies the basic principles of the pneumatic tube and eliminates the objectionable features of the ordinary air tube.

This tube contains seventy-five per cent pure rubber, coupled with the usual admixture of chemicals. The outside of the tube is recessed by 30 to 40 suction cups which take up and distribute the shock received in running. Anyone who has played basket-ball knows that the suction cups in the soles of his shoes enable him to come to a quick stop by sticking to the floor. In the same manner do these suction cups cling to the tire casing so that there is no such thing as creeping as often happens with an under-inflated air tire.

I have sharp ears, and I can hear my readers say "Why, that tube is almost solid and with the casing forms a solid tire." True in part, but this tube through its center channel and suction cups offers room for expansion. It is, of course, much heavier than the pneumatic tire. This weight, however, is an asset rather than a liability for various reasons. It is a well-known fact that a car using air tires is to a degree top-heavy. This fact would mean nothing whatever if all the roads in the world were level and smooth, but the motorist knows how rough roads really are. For instance, let us suppose that you are trying to take a rough hill on high. The speed of the car together with the top-heaviness will cause the rear wheels to leave the ground when they hit a rough spot. Every time the wheels leave the ground there is lost power and lost motion, which in turn means abuse of the engine and the tire casings, and invariably the driver has to shift gears to reach the top of the hill. With this heavier tire, the top-heaviness is eliminated, the car is equally balanced, it runs much more smoothly and consequently does not leave the ground on the least provocation. Incidentally that hill can be taken on high.

Tests made personally by the Detroit representative of the firm manufacturing these tires, and extending over a period of two years show a total mileage during that period of thirty-six thousand miles on a single set of tubes. In fact, this test is still going on, for he is using the tubes every day. In the latter part of 1918, he replaced the original set of casings because they were so badly worn that the tubes were visible in half a dozen places—not only visible, but actually riding the pavements. This was after a total run of twenty-four thousand miles.

Another test made by the Detroit Police Department proves quite interesting. In February, 1919, permission was obtained from Captain Kling, then a lieutenant on the Detroit police force, to install a set of tubes on the "minute car" of the department. This car is a general utility Ford touring car which is on the go twenty-four hours a day, and is operated by three shifts of drivers. The tires were installed during an overhaul period and none of the drivers knew of the installation. Three months had gone by before the drivers knew they were using other than pneumatic tubes, as each thought the other fellow was looking after the tires. These three drivers swear by the tubes and claim that the car is giving better service than ever before.

Maurice S. Clement.

Detroit, Michigan.

THE EDITOR'S BOOK TABLE.

"A RUBBER PLANT SURVEY OF WESTERN NORTH AMERICA." By Harvey Monroe Hall and Thomas Harper Goodspeed. University of California Press, Berkeley, California, 1919. (Paper, 7 x 10½ inches, 121 pages.)

IN THIS BOOK THE AUTHORS HAVE REPORTED the results of an extensive survey of the Great Basin region for rubbber-producing plants, begun in 1917 as a war-emergency measure.

During 1918 this broadened into a comprehensive search throughout the West for all species known or suspected to contain rubber. The work is to be continued to determine all the possibilities of rubber production in the West. Rubber was found in 25 of the species examined, although in only four was it high enough to warrant the hope for its recovery on a commercial scale.

NEW TRADE PUBLICATIONS.

THE GILLETTE RUBBER CO., EAU CLAIRE, WISCONSIN, ISSUE AN illustrated catalog of rubber machinery and equipment in a handsome loose-leaf binder. On the covers are views of the exterior and interior of the company's buildings. The catalog contains cuts and descriptions of a mixing mill, inner tube splicing press, wrapping lathe, valve nut tightener, tire stripping stand, bead making machine, tire building stand with foot pedal, core puller; tire-buffing machine and stock racks.

THE LINK-BELT CO., CHICAGO, ILLINOIS, HAS RECENTLY ISSUED two handsome illustrated books devoted to its modern labor-saving equipment. Book No. 375 is a profusely illustrated brochure of 108 pages showing the application of link-belt elevators, conveyors, and other freight and package handling machinery to many varied industries. Among these applications is included an elevator for conveying tire bands, and a conveyor used in assembling electric storage batteries. Book No. 380, of 100 pages, depicts in a similar manner the manifold uses of link-belt hoists and overhead cranes.

THE BULLETIN OF THE CHAMBER OF COMMERCE OF THE UNITED States of America in the Argentine Republic, Volume 1, No. 1, dated August 20, 1919, and two succeeding issues have come to hand. This readable and attractive new publication is devoted to the foreign trade of the United States with particular reference to the Argentine Republic, and will endeavor to give American exporters accurate and helpful information and suggestion for the betterment of commercial relations between the two countries. The rubber and allied industries are identified with the chamber, as seen by consulting the list of officers and members. Among the former may be mentioned the treasurer, Noel F. Tribe, of The First National Bank of Boston, and one of the governors, J. A. Wheatley, of the Ault & Wiborg Co., Cincinnati, Ohio. The 123 active members include the Corn Products Refining Co., Goodyear Tire & Rubber Co. of South America, United States Rubber Export Co., Limited, The First National Bank of Boston, Sucursal Buenos Aires, Westinghouse Electric Export Co., Brunswick-Balke-Collender Co. of New York, Robbins & Myers Co., and the Firestone Tire & Rubber Co.

THE NEDERLANDSCHE GUTTA-PERCHA MAATSCHAPPIJ, THE Hague, Holland, owning factories at Singapore and plantations in the East, is increasing its issued capital to Fl. 1,675,000 ($673,350) by the offer of 250,000 ordinary "A" shares at 200 per cent.

The Question of Tire Guaranties and Adjustments.

FROM THE OUTSET of tire manufacture tire guaranties have been burning questions, and so they still continue. If a tire does not give the guaranteed mileage or better the consumer asserts that the product is faulty, while the manufacturer maintains that it has been abused in use. Each claims that the other is at fault and should stand the loss. To an unprejudiced third party who does not know the facts it seems that both sides make out a good case. What then is the truth of the matter; what has brought such a situation about; how are such differences of opinion possible, and is there a remedy?

During the early years of bicycling, and when the automobile was young, rubber manufacturers knew little about building tires, and had no machinery or other facilities for turning them out in large quantities. But the bicycle and the automobile caught the popular fancy and supplied a genuine economic need. The more serious problems which had previously hampered their development were eliminated by the use of rubber tires and so rapid was the increasing demand and so insistent did it become that rubber companies were forced to experiment and develop their product and methods of manufacture as they went along, with the result that tires have been an ever-changing product in constant process of evolution.

THE DEBATABLE GROUND OF TIRE MILEAGE GUARANTIES.

Some firms succeeded much better than others and by secret and patented processes turned out higher grade tires than their competitors. Seeking to maintain the prestige thus won, and to protect the public against inferior goods, they established guaranties at first based on time and later on mileage.

Although originally instituted with the best intentions, these guaranties soon became the bane of the tire trade and brought about the worst forms of cut-throat competition. There was no uniformity about them, and some firms made the mistake of offering more lavish guaranties in order to get big orders when an attempt to discount the prices of their competitors failed. So reckless did they become that many concerns conducted business at a loss and would gladly have given up half of it to be rid of the guaranty nuisance.

For several years it seemed impossible to get the manufacturers together on a common ground to remedy the evil. In 1896, however, twenty-one leading tire manufacturers were licensed under the Tillinghast patents owned by Colonel Theodore A. Dodge. This and the fact that he was less actively engaged in competition than other tire men gave him a more independent position in the trade. Under his leadership The Rubber Tire Association was organized and a standard form of guaranty was adopted.

Under this guaranty tires showing defective material or workmanship were replaced and all practicable repairs were made free of charge no matter how the injury had been caused, provided the tires were delivered to the manufacturer express prepaid and further that anti-leak preparation had been used. Thus pneumatic tires were at first guaranteed against punctures.

So liberal a guaranty, it was believed, would deter any manufacturer from using poor materials or allowing imperfect workmanship, for it seemed that nobody could afford to offer this guaranty on any but a good tire. And such would probably have been the case had it not been for the loose manner in which the guaranties were made good under the stimulus of keen competition. Whoever needed new tires could usually get them gratis from the manufacturer. This injured retail trade. Moreover, so long as new tires could be had without paying for them, neither the price nor the quality mattered. Prices had to be unnecessarily high in order to cover these inordinate losses, and even then many manufacturers did not break even on their tire business.

Later the guaranty was limited to defective material and workmanship, and cutting of the rim, but punctures were still repaired free. Year by year the terms were still narrowed and the time limit was also shortened. There were guaranties for a year, then for a season, and in 1897 manufacturers began to charge for all repairs.

Several years ago all tire guaranties were placed on a mileage basis, and year by year with better materials and improved methods of manufacture these guaranteed mileages have increased from 1,500 miles at the outset to 5,000 or 6,000 miles for fabric tires and 8,000 to 10,000 miles for cord tires to-day. At first the public manifested some tendency to buy cheap tires, but soon began to learn that the best is the cheapest. The change therefore improved matters considerably, yet it was still possible to get a new tire by claiming defective material or workmanship and paying a small percentage of the full purchase price based on the service mileage obtained from the alleged defectivve tire. Never has there been a greater temptation toward prevarication than has been offered by tire mileage guaranties, and the resulting situation is well shown in King's cartoon in the "Buffalo Express" of August 12, 1919.

Thus while tires generally have improved enormously in quality in recent years, they have been bought by the public not alone on their merit, but to a considerable degree on the liberality of adjustments made by certain companies. Guaranty conditions have been widely violated; the adjustment privilege has been greatly abused, and millions of tires have been sold annually at only a fraction of the full list price. Such a practice of putting a premium on the tricks of motorists and cyclists to replace their damaged and worn-out tires at another's expense has been manifestly unfair to manufacturers and honest consumers, and has kept prices unnecessarily high.

Manufacturers have by no means been ignorant of these abuses, but until recently the peculiar conditions of the trade have been such that neither could these abuses be checked nor the guaranty conditions adequately enforced in making adjustments. Leading makes of tires are now giving such excellent service, however,

that under reduced prices and the increased mileage guaranties and unlimited guaranties covering materials and workmanship during the entire life of the tire which have recently been inaugurated, a marked stiffening up on adjustments has been possible. Honest users are satisfied with this fair treatment, while the avaricious tire users still make unfair claims.

The real trouble is that tire users have from the outset been allowed to expect so much that many have come to believe that to neglect or abuse their tires and have the manufacturer stand the expense is their inalienable right. If such persons will patronize only reputable concerns they will seldom find cause for just complaint. Tire companies of good standing have a reputation to maintain, both for quality of output and fair dealing, and are eager to maintain it. With them tire manufacture has become an exact science. So carefully are materials bought, so rigid is the inspection of materials and workmanship, so greatly improved are the processes of tire building, that a defective tire rarely reaches the consumer. When it does, the defect is obvious to an expert and will be gladly adjusted to the satisfaction of the user. Practical experience has now been sufficient, however, to show exactly how a tire of any given make, type and construction will wear under all conditions, and prevarication is of little avail with an expert adjuster.

The relative merits of the mileage and unlimited guaranty have been much discussed. Both have certain advantages, yet the adjustments now being made under both systems are substantially the same. For many years THE INDIA RUBBER WORLD has asserted that any sort of tire guaranty, aside from the implied assurance that every reputable manufacturer will stand behind his products, is guaranteeing the unguaranteeable, and it still believes that tire guaranties will eventually be abandoned by the trade because from the very character of the service a tire is called upon to perform the duration of that service cannot be foretold.

It is logical enough to guarantee a watch or a clock because one can predict its normal use and treatment. The same is true of a piano or a phonograph, for example. But a tire has no normal career, and calls for a guaranty no more than a suit of clothes or a pair of shoes. When it leaves the factory a dozen different futures may be open to it, involving good or bad roads, careful usage or abuse, proper repair or neglect through ignorance or indifference. It may leave the factory good for 10,000 miles of careful usage, yet everything considered, it is humanly impossible to guarantee half or even one-quarter of that distance. Would it not, therefore, be better for manufacturers to make the best tires possible, and without other than an implied guaranty advertise, for example, that they are averaging 6,000 miles? It would be a welcome relief to the manufacturers, and they could afford to give the consumer still lower prices. It would tend to make the user more careful of his tires, and would make strongly for general veracity and better feeling. There is always the argument that should one firm adopt such a course it would be playing into the hands of competitors who continue their guaranties, but the time will probably come when most leading firms can agree on such a policy and put it over without loss to anybody.

Dunlop Rubber Co. Plans to Enter American Tire Market.

AT AN EXTRAORDINARY MEETING of the Dunlop Rubber Co., Limited, held in London on December 2, 1919, the new chairman, A. I. Ormrod, explained to the shareholders the plan for increasing the capital of the company, which was made public at the close of November and caused some unfavorable criticism.

OF THE ENGLISH DUNLOP AT BIRMINGHAM, ENGLAND. BIRD'S EYE VIEW OF THE NEW MILLS (42 ACRES OF BUILDINGS)

The proposed plan was to increase the capital to £7,500,000 by creating 1,000,000 additional ordinary shares of £1 each, which should be equal to the existing ordinary shares, except that they would draw no dividend that might be declared for the financial year that ended on August 31. The intention was to offer the new shares first to the present holders of ordinary shares on a basis of two new shares for every three old ones; to set aside twenty thousand shares for employes, and if any were left over, to turn them over to the guarantor of the new issue. The holders of preferred stock were to have no special rights to the new issue. It was this exclusion of the preferred stockholders that aroused criticism, and that seems to have led the London Stock Exchange to hold up the issue of the new stock until its requirements are satisfied. No objection seems to be taken to Mr. Ormrod's declaration that a part of the new capital is to be used in a campaign for the American market.

It may be recalled that in 1917, when the Dunlop company made its large increase in capital that brought the amount up to £6,000,000, there were rumors that led the chairman of that day to deny there was any intention of competing in the American market, and to publish the statement that "There is nothing to support the idea that tire makers of Great Britain are combining to fight new foreign competition." Mr. Ormrod, now, after explaining that £1,600,000 of the amount raised is to be

spent on the work at Fort Dunlop, another £1,000,000 in France, and large sums for other needs toward the company's development, states that £1,000,000 are to be employed in America to start, among other things, a rubber plant that shall be the counterpart of Fort Dunlop, with improvements, and that the sum is a mere beginning, because the officials of the Dunlop company are in touch with a leading American banking house regarding the raising of the additional £6,000,000, which will be needed to fully carry out the scheme.

He explained that in 1916, the rights of manufacturing and trading in the United States were bought back from the American Dunlop Co; that a committee of experts sent to the United States this year reported that it is a good time for the extension there of the Dunlop business; that he himself examined conditions in America during the war, although he was not then connected with the Dunlop company. He said, also, that a Dunlop American Trust, Limited, had been formed for the purpose of forming a company in the United States to be called "Dunlop America Limited," or some such title. The plan is for the Dunlop Rubber Co. to take at par 1,000,000 ordinary shares in the American company, one-fourth of the ordinary shares; it will receive also for its trouble 10 per cent of the cost of erecting and equipping a rubber plant, and a royalty on the American net profits. The Dunlop Rubber Co. will also have a right to name a majority of the directors, and if any further increase of the ordinary stock is made by the American company, it must provide that the British company may buy one-fourth of the new stock at par.

The stockholders present applauded the speech and seemed to find no objection to this carefully thought out plan for invading the American rubber market. Mr. Ormrod expatiated on the probable large profits and declared: "American tires will come, anyway—they had better be Dunlop-American."

Since the above announcement was made, there have been incorporated in the United States two new companies under the laws of New York, namely, Dunlop America Limited, and Dunlop Wheel & Rim Co., Inc., details concerning which appear elsewhere in this issue.

Steps are being taken already to have the Canadian company, The Dunlop Tire & Rubber Goods Co., Limited, of Toronto, cooperate in the new plan. The sum of $1,500,000 has been appropriated for erecting a new factory in Toronto. The building, fronting on three streets—Queen, Booth and Natalie—is well under way and is being rushed to completion; it is 400 feet by 80 feet, four stories high above the basement. It will be devoted especially to the manufacture of the Dunlop cord tires, "Traction" and "Ribbed."

BRIEF HISTORICAL REVIEW OF THE DUNLOP COMPANY.

The Dunlop companies have played so important a part in the development of rubber tires that a brief review of their history may be interesting. The invention by Dr. John B. Dunlop of a pneumatic tire for his little boy's bicycle in 1888 was taken up by the late Harvey du Cros at the moment when the bicycle craze was taking hold of England, and the Pneumatic Tyre Co., Limited, was started in Dublin with a capital of £15,000 in 1889. The company was pushed energetically and by 1893, subsidiary companies were started in the United States and in France. In 1896 came the great boom in which Ernest Terah Hooley took a hand and won his notoriety. The Dunlop Pneumatic Tyre Co. was capitalized at £5,000,000, and the pneumatic tire business was so good that Mr. du Cros was able to pull the company through after Hooley's collapse. It is interesting to note that The India Rubber World at that time, while warning against the excessive enthusiasm for bicycles, remarked, "The horseless carriage is also coming in for a share of attention, and the makers of tires are hoping for a new field for their industry in equipping these vehicles with rubber."

The American Dunlop Tire Co. lasted till 1901. The *Société Française des Pneumatiques Dunlop*, after the French courts had decided that the Dunlop patents were invalid, was sold to the British company in 1909. In 1899 two other important subsidiary companies were formed—the Dunlop Tire Co. of Canada, Limited (now the Dunlop Tire & Rubber Goods Co., Limited), with £1,000,000 capital, and the Dunlop Pneumatic Tyre Co. of Australasia, Limited, with £120,000. There was also established a Dunlop Pneumatic Tyre Co. (Continental), Limited, in London, which was to acquire the Dunlop branches in Italy, Denmark, Belgium, Holland and Russia. Later a Dunlop Pneumatic Tyre Co., G. m. b. H., was established at Hanau in Germany (1904), and a Dunlop Rubber Co. (Far East), Limited, at Singapore (1909), and near Kobe, in Japan (1910).

As is well known, the Dunlop patent proved of no avail, as Thomson had patented practically the same tire in 1844, and had applied it to carriages. Mr. du Cros, however, soon acquired other important patents, notably the Welsh and the "Clincher," some of them American, and was able to keep the lead in the industry which he had started. In 1904, by which time it was clear that the bicycle trade was declining, he had turned his attention to the possibilities of the fast developing motor trade; the company's capital was then £4,000,000.

After the Dunlop Pneumatic Tyre Co. had become a subsidiary of the Dunlop Rubber Co., the present organization, its capital was reduced. In 1917 there was much activity in the rubber company. The capital stock was increased to £6,000,000, by creating £3,000,000 of 7 per cent preference shares, which were in addition to £1,000,000 of 6½ per cent preference shares created the year before. Moreover, there were rumors that brought out the statement that the increase was not intended "To support the idea that the tire makers of Great Britain are combining to fight new foreign competition." Later there was uneasiness because a firm of brokers was believed to have bought £4,000,000 ordinary shares of Dunlop for financial interests that were not in harmony with the persons who controlled the company.

It should be noted that the additional £1,000,000 shares to be offered now are expected to bring in, not their par value, but £8,000,000.

In 1913 the works at Fort Dunlop were begun. This is a plot of land containing 290 acres, about five miles from Birmingham, close to the canal and the railway. The buildings already put up on this ground cover more than 27½ acres and will soon cover more than 40 acres. In 1914 the company began to build its own cotton mills, and at present the Dunlop company's cotton mills are valued at £3,000,000.

BONUSES FOR SALARIED RUBBER EMPLOYES.

As a holiday remembrance the United States Rubber Co., New York City, gave to its salaried officers and employes in this country, including subsidiary companies, a bonus of 10 per cent of their salaries, if not exceeding $2,000 annually. All those receiving higher salaries were given $200. About 7,500 persons were benefited by this Christmas gift.

The B. F. Goodrich Rubber Co., announces that 25 per cent of their annual pay will be given to all salaried employes this year. Approximately $2,500,000 will thus be distributed to about 7,500 employes.

The Mason Tire & Rubber Co., Kent, Ohio, announces an unlimited mileage guarantee stating that no matter how far a Mason tire has run, if it should develop any defect in material or workmanship, it will be adjusted fairly on the basis of the service it would have given had the defect not existed.

At an exhibition held for four days during the month of August at Tjiandoer, Java, the *Naamloose Vennootschap Rubber en Handel Maatschappij Tjiandoer* of Pasir Hajam had an exceptionally fine display of inland crude rubber samples.

News of the American Rubber Trade.

DIVIDENDS.

THE AMERICAN CHICLE CO., NEW YORK CITY, has declared its quarterly dividend of one and one-half per cent, payable January 2, 1920, on preferred stock of record December 20, 1919.

Ames Holden McCready, Limited, Montreal, Quebec, has declared its quarterly dividend of one and three-quarters per cent, payable January 2, 1920, on preferred stock of record December 19, 1919.

The American Zinc, Lead & Smelting Co., St. Louis, Missouri, and Boston, Massachusetts, has declared its quarterly dividend of $1 per share, payable February 2 on preferred stock of record January 23, 1920.

The Apsley Rubber Co., Hudson, Massachusetts, has declared its semi-annual dividend of three and one-half per cent, payable January 1, 1920, on preferred stock of record December 31, 1919.

The Brunswick-Balke-Collender Co., Chicago, Illinois, has declared its quarterly dividend of one and three-quarters per cent, payable January 1, 1920, on preferred stock of record December 20, 1919.

The Canadian Westinghouse Co., Limited, Hamilton, Ontario, has declared a quarterly dividend of one and three-quarters per cent and an extra dividend of one per cent, both payable January 1, 1920, on stock of record December 19, 1919.

The Corn Products Refining Co., New York City, has declared an initial regular quarterly dividend of one per cent and an extra dividend of one-half of one per cent on common stock; also, a regular quarterly dividend of one and three-quarters per cent on preferred stock; all payable January 20 on stock of record January 5, 1920.

The Driver-Harris Co., Harrison, New Jersey, has declared quarterly dividends of two per cent on common stock, and of one and three-quarters per cent on preferred stock, both payable January 2, 1920, on stock of record December 22, 1919.

E. I. du Pont de Nemours & Co. (incorporated), Wilmington, Delaware, has declared a quarterly dividend of one and one-half per cent on debenture stock of record January 10, payable January 26, 1920.

The Firestone Tire & Rubber Co., Akron, Ohio, has declared the following dividends: two per cent special, payable December 20 on stock of record December 15, 1919; one and one-half per cent quarterly, payable January 15 on six per cent preferred stock of record January 1, 1920; and one and three-quarters per cent quarterly, payable February 15 on seven per cent preferred stock of record February 5, 1920.

The First National Bank, Boston, Massachusetts, has declared the following dividends: quarterly, at five and four per cent on stock of record December 31 and December 24, 1919, respectively, both payable in January, 1920; extra, one per cent, payable January 2, 1920, on stock of record December 24, 1919.

The General Tire & Rubber Co., Akron, Ohio, has declared quarterly dividends of one and three-quarters per cent, payable January 2, 1920, on common and preferred stock, respectively, of record December 20, 1919.

The B. F. Goodrich Co., Akron, Ohio, has declared a quarterly dividend of $1 per share, payable February 16 on stock of record February 5, 1920.

The Hodgman Rubber Co., Tuckahoe, New York, has declared a dividend of $1.13 on preferred stock of record January 15, payable February 1, 1920.

The Keystone Tire & Rubber Co., Inc., New York City, has declared a quarterly dividend of three per cent on stock of record December 15, 1919, payable January 2, 1920.

The McLean Tire & Rubber Co., East Liverpool, Ohio, has declared dividends of four and one-half and three and one-half per cent, respectively, on common and preferred stock, payable December 30 on stock of record December 20, 1919.

The Madison Tire & Rubber Co., Buffalo, New York, has declared its initial quarterly dividend of two per cent, payable January 2, 1920, on preferred stock of record December 24, 1919.

The Mt. Vernon-Woodbury Mills, Inc., Baltimore, Maryland, has declared its semi-annual dividend of three and one-half per cent on preferred stock of record December 21, 1919, payable January 15, 1920.

The National Aniline & Chemical Co., New York City, has declared its quarterly dividend of one and three-quarters per cent on preferred stock of record December 15, 1919, payable January 1, 1920.

The Portage Rubber Co., Akron, Ohio, has declared its quarterly dividend of one and three-quarters per cent on preferred stock of record December 20, 1919, payable January 1, 1920.

The Tropical Tire & Rubber Co., 51 Leonard street, New York City, has declared its semi-annual dividend of four per cent on Class A stock of record December 10, 1919, payable January 2, 1920.

The United Shoe Machinery Corp., Boston, Massachusetts, has declared the following dividends: one and one-half per cent on preferred stock and fifty cents per share on common stock, both payable January 5, 1920, on stock of record December 16, 1919.

The Westinghouse & Electric Manufacturing Co., East Pittsburgh, Pennsylvania, has declared the following quarterly dividends: two per cent on common stock of record January 2, payable January 31; one per cent on preferred stock of record January 2, payable January 15, 1920.

The Winnsboro Mills, Winnsboro, South Carolina, have declared a quarterly dividend of one and three-quarters per cent on preferred stock of record December 24, payable January 1, 1920.

FINANCIAL NOTES.

The Boston Belting Co. has asked permission to increase its authorized capital stock from 10,000 to 15,300 shares. The new capital will consist of 10,300 preferred shares of $50 par, and 5,000 common shares of $100 par. Preferred dividends will be cumulative at 7 per cent.

Thomas Clements, comptroller of the Firestone Tire & Rubber Co., has announced the purpose of the Firestone company to build a million-dollar plant in Singapore for the preparation of crude rubber for manufacture into tires.

The business of the Firestone Tire & Rubber Co. for the year ended October 31, totaled $91,078,513, an increase of 20 per cent over that of the previous year. The company is behind on its orders and there is every reason to expect continued growth and prosperity during 1920.

Common no-par stock of the Victor Rubber Co., Springfield, Ohio, recently offered to the public in Cleveland, was rapidly taken at $35 per share. Of the 50,000 shares of this stock authorized to be issued, only 35,000 are at present being offered.

It will be noted in the following statement that the Perfection Tire & Rubber Co. has no bonded mortgage or preferred stock indebtedness and that the fixed and liquid assets have shown an increase in the first five months of this year of $1,522,512.62. Regarding income, profit and loss for the first five months of this year, a comparison of the figures shows very substantial

increases, as indicated by the surplus account and other items covering liquid assets, especially in consideration of the fact that the Government war restrictions were not removed until December 15, 1918. The net profits for the month of May amounted to $60,102.20. These earnings are from "Perfection" products alone and do not include profits from outside contracts.

ASSETS	January 1, 1919.	May 1, 1919.	June 1, 1919.
Cash on hand and in banks.	$12,950.00	$137,327.85	$213,359.02
Trade acceptances—notes and accounts receivable (less reserve for bad accounts).	182,565.83	341,672.79	481,978.56
Liberty bonds	1,500.00	3,650.00	3,650.00
Inventories:			
Raw material—finished goods—work in process	505,141.51	580,403.92	815,902.15
Investments—real estate and housing account, Dickinson Cord Tire Corp..........	78,644.58	364,163.72	378,337.38
Fixed assets—buildings, land, machinery and equipment (less reserve for depreciation)	905,438.12	1,009,018.73	1,297,291.83
Due from fiscal agents......	2,365,724.08	1,614,485.73	1,013,507.48
Deposits on new equipment.	3,400.00	30,369.28	11,781.57
Patents, contracts, trade marks, good will, organization expense	11,314,874.91	11,310,476.60	11,353,492.53
Prepaid charges	6,454.68	11,462.34	16,306.83
In suspense	....	210.00	....
Totals	$15,376,693.71	$15,403,240.96	$15,567,607.35
LIABILITIES.			
Notes and accounts payable..	$271,509.27	$208,190.10	$318,966.16
Notes receivable discounted.	....	6,247.00	....
Reserve for liabilities and taxes	6,000.00	7,004.82	7,854.97
Deferred payments on real estate	6,600.00	6,600.00	5,498.00
Capital	15,000,000.00	15,000,000.00	15,000,000.00
Surplus and undivided profits	92,584.44	175,199.04	235,288.22
Totals	$15,376,693.71	$15,403,240.96	$15,567,607.35

Goodyear Tire & Rubber Co. of Canada voted December 13 to increase its authorized capitalization from $3,000,000 to $30,000,000, divided into $15,000,000 common and $15,000,000 cumulative preferred.

Four-fifths of the 40,000 additional shares issued by the Lee Rubber & Tire Corp., had been taken up at $33 a share by its shareholders by December 1, with the prospect that the same will be done with most of the remainder. The company's earnings for 1919 are estimated at $600,000 after taxes and charges are paid. If earnings increase next year by 75 per cent, as is anticipated, it is probable that payment of dividends will be resumed soon.

In order to provide funds for building and equipping a manufacturing plant at Stamford, Connecticut, and for other corporate purposes, the Carlisle Tire Corp., New York City, is offering for subscription shares of its 8 per cent cumulative preferred stock at par, accompanied by a substantial bonus of no-par-value common stock. The bonus, however, is subject to reduction without notice.

The company owns a 10-acre plant site at Stamford affording ample room for the erection of ten factory units, each having an output of 400 tires a day. Pending the erection of the new plant, Carlisle cord tires will continue to be manufactured in the leased plant at Andover, Massachusetts.

Lee, Higginson & Co., bankers, Boston, Massachusetts, announces the issuance of $4,000,000 of 7 per cent cumulative preferred stock of Winnsboro Mills, a Massachusetts corporation with a plant at Winnsboro, South Carolina. Cord fabric for automobile tires is the product manufactured and the plant is to be enlarged at a cost of about $3,000,000 to supply the increased demand of the United States Rubber Co., which buys the entire output of these mills under a contract running until 1927. The officers and directors of Winnsboro Mills are S. Harold Greene, president; Henry C. Everett, Jr., treasurer; Charles L. Talbot, clerk; Robert E. Barwell and Frank J. Hale.

NEW INCORPORATIONS.

Amalgamated Tire Stores Corp., October 27 (New York), $3,000. S. Newman, 233 West 54th street; J. T. McGovern, 141 Broadway; E. D. Newman, 55 Liberty street—all of New York City. Principal office, 1974 Broadway, New York City. To sell tires.

Anniston Tire & Rubber Co., Inc., October 7 (New York), $6,000. J. Jacobs; S. Bernheim; W. Loewenthal—all of 1877 Broadway, New York City. To manufacture tires.

Brewster Tire Service, Inc., December 22 (New York), $5,000. S. S. Braunberg, 483 Ninth street, Brooklyn; G. F. Brewster, Hotel Gramercy; W. R. Rosenkranse, 322 East 19th street, both of New York City—all in New York. To repair tires.

Buckeye Rubber Products Co., September 11 (Ohio), $2,500,000. C. H. Roth, president and general manager; W. Norris, vice-president; J. M. MacKay, treasurer and sales manager; C. V. Goepper, secretary. Principal office, National City Building, Cleveland, Ohio. Factory, Willoughby, Ohio. To manufacture molded rubber goods, etc.

Burnet-Webb Tire Corp., December 5 (New York), $10,000. J. H. Burnet, 816 Bellevue avenue; A. E. Webb, 707 Park street; W. E. Housel, 706 Wilder Building—all of Syracuse, New York. Principal office, Syracuse, New York. To manufacture auto tires, etc.

Colonial Cycle Supply Co., Inc., November 1 (New York), $50,000. G. M. Port, president and purchasing agent; N. A. Port, vice-president and treasurer; B. M. Port, secretary. Principal office, 35 Murray street, New York City. To manufacture auto and bicycle supplies.

Courier Rubber Co., Inc., The, October 14 (New York), $150,000; R. E. Clift, 112 East 17th street; C. P. Brown, 10 Wall street, both of New York City; W. D. Laurie, Montclair, New Jersey. To manufacture tires.

Delion Tire & Rubber Co., June 1 (Maryland), $10,000. F. G. Hilken and W. A. Rodgers, both of 133 West Mount Royal avenue; E. A. Strauff, 3 East Lexington street, all in Baltimore, Maryland. Principal office, 133 West Mount Royal avenue, Baltimore, Maryland. To manufacture tires and tubes.

Diadem Leather Co., October 27 (Maine), $1,000,000. J. M. Roche, president; A. C. Libby, treasurer; S. A. Paul, clerk—all of Portland, Maine. Principal office, Portland, Maine. To manufacture and deal in all kinds of rubber and leather goods.

Dunlop America Limited, December 5 (New York), $500. F. R. Butehorn, 764 St. Johns Place, Brooklyn; R. S. Baker, 37 Wall street; E. S. Hawley, 50 Vanderbilt avenue, both of New York City—all in New York. To manufacture auto tires.

Dunlop Wheel & Rim Co., Inc., December 19 (New York), $500. R. S. Baker, 37 Wall street; E. S. Hawley, 50 Vanderbilt avenue, both of New York City; F. H. Butehorn, 764 St. Johns Place, Brooklyn—all in New York. To manufacture auto accessories.

Fabric Innershoe Corp., November 29 (New York), $200,000. G. T. Fish; W. W. Sutton, Jr.; B. H. Engelke—all of 15 Broad street, New York City. To manufacture tire reliners, etc.

Garden Tire & Rubber Co., Inc., October 14 (New York), $5,000. J. Jacobs; W. Loewenthal; S. Bernheim—all of 1877 Broadway, New York City. To manufacture tires, etc.

Gillette Tire Co., Inc., December 15 (New York), $200,000. B. J. and M. R. Shafer, both of East Orange, New Jersey; H. F. Rudiger, Lynbrook, New York. To manufacture tires.

Goodwill Rubber Co., Inc., October 20 (New York), $1,000. W. W. Reeves; P. D. Benson; A. E. Claffey—all of 154 Nassau street, New York City. To do a tire business.

Henderson Tire Export Co., Inc., December 23 (New York), $25,000. P. A. Zizelman, 38 Park Row; H. F. Hill, 1482 Broadway; R. C. Owens, Wallick Hotel—all of New York City. To deal in tires.

Hindman, Dudde, Lyle, Inc., October 16 (New York), $20,500. C. A. Hindman, 565 West 192nd street; W. Dudde, 1060 Woodycrest avenue, both of New York City; M. E. Lyle, Hackensack, New Jersey. To deal in tires.

K. & S. Tire & Rubber Goods, Ltd., October 16 (Canada), $3,500,000. W. J. Sheppard, Waubaushene; J. B. Tudhope, M. P., Orilla; D. L. White, Midland; T. H. Sheppard, Toronto; J. O'Mara, Toronto; H. J. Daly, Toronto; J. P. Bickell, Toronto—all in Ontario, Canada. To manufacture tires and rubber goods.

King Leather Tire Co., November 24 (Delaware), $1,000,000. M. L. Rogers, L. A. Irwin, W. G. Singer—all of Wilmington, Delaware. To manufacture automobile tires and other accessories.

Kinzie Rubber & Manufacturing Co., October 25 (Illinois), $350,000. E. C. Klauber, president, treasurer and purchasing agent; H. T. Kessler and L. J. Ulber, vice-presidents; G. F. Gabel, secretary. Principal office, 1514 West Kinzie street, Chicago, Illinois. To manufacture raincoats, rubber sheeting and rubber cements.

Kraus Tire Co., Inc., J. H., December 8 (New York), $25,000. J. H. Kraus, Rochester; M. L. and S. R. Armstrong, both of Caledonia—all in New York. Principal office, Rochester, New York. To deal in tires.

Long Distance Tire & Rubber Co., Inc., The, October 20 (New York), $200,000. B. Gunner, 200 West 111th street; L. Victor, 1972 Seventh avenue; M. T. Newmark, 988 Tiffany street—all in New York City. To deal in tires.

Master Grip Rubber Co., The, November 17 (California), $100,000. J. D. F. Jennings, I. W. Hellman. Principal office, Los Angeles, California. To deal in tires.

Monarch Rain Coat Co., Inc., December 24 (New York), $15,000. M. Rubin, 1416 43d street; M. Rosenstein, 480 Junius street, both of Brooklyn; S. Kaplinsky, 1569 Hoe avenue, Bronx—all in New York. To manufacture raincoats, etc.

Montana Tire Co., May 20 (Montana), $500,000. C. J. Drope, Akron, Ohio; J. R. Swan, secretary and treasurer; F. C. Plouf, A. S. Dowall, Jr., G. C. C. Stenning, directors—all of Great Falls, Montana. Principal office, 409 Central avenue, Great Falls, Cascade County, Montana. To manufacture tires, tubes and rubber sundries.

Paducah Tire Co., Inc., October 7 (New York), $3,000. J. Jacobs, W. Loewenthal, S. Bernheim—all of 1877 Broadway, New York City. To manufacture tires.

Pond Electric & Battery Service, Inc., December 15 (New York), $200,000. F. O. Pond; F. R. Kirk, V. E. Mather—all of Malone, New York. Principal office, Malone, New York. To manufacture tires and batteries.

Rawhide Tire Corp., December 24 (New York), $20,000. L. Loeb, H. H. Levin, A. H. Friedman—all of 5 Beekman street, New York City. To deal in tires.

Rosset [illegible] & Mfg. Co., October [illegible] (Delaware), [illegible] capital 50,000 shares without nominal or par value. T. L. Croteau, P. B. Drew, H. F. K[illegible], all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture and deal in tires and tubes.

Salvage Tire Co., Inc., October 14 (New York), $100,000. G. T. Fish, B. H. Engelke, W. W. Sutton, Jr.—all of 15 Broad street, New York City. To manufacture and rebuild tires.

Schlissel Safety Tire Protector Co., Inc., December 16 (New York), $500,000. L. Schissel, 640 McDonald street; R. Kestler, 174 South Ninth street, both of Brooklyn; R. Oelkers, 838 West End avenue, New York City—all in New York. To manufacture tires, protectors, etc.

Stoddard Tire & Rubber Corp., December 10 (New York), $500,000. C. H. Stoddard, Navy Yard, Brooklyn; J. A. Sands, F. D. Yates, both of 150 Nassau street, New York City—all in New York. To manufacture tires, etc.

Strongcord Tire & Rubber Manufacturing Co., November 15 (Indiana), $2[illegible],000. S. W. S[illegible], A. C[illegible], F. B. Mesker, D. Chappell, C. Haase—all of Evansville, Ind. Principal office, Evansville, Indiana. To manufacture rubber tires and other rubber goods.

Stuart Puncture Proof Liner & Tire Co., The, September 24 (Oregon), $50,000. C. A. Stuart, president; M. P. Chapman, vice-president; E. J. Noble, secretary; T. P. Randall, treasurer; B. J. Statts, manager. Principal office, Oregon City, Oregon. To manufacture and sell a puncture proof liner and tire for pneumatic automobile tires.

Trent Rubber Co., September 29 (New Jersey), $[illegible],000. H. A. Ludeke; I. A. Worthington, both of Trenton; K. Keller, Hoboken—all in New Jersey. Principal office, 26 West State street, Trenton, New Jersey. Agent in charge, M. G. Buchanan. To manufacture, purchase and sell tires, tubes, etc. (Formerly The Atlas Tire & Rubber Co.)

United States Puncture-Proof Co., November 22 (Delaware), $5,000,000. W. F. O'Keefe; G. G. Steigler, J. H. Dowdell—all of Wilmington, Delaware. To manufacture inner tubes, casings, etc.

Wildman Rubber Co., The, November 8 (Delaware), $10,000,000. W. W. Wildman, 160 Calvert avenue; L. C. MacGregor, both of Detroit; H. P. Orr, Lansing—all in Michigan. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture and sell all kinds of automobile tires, tubes and other rubber goods.

World Rubber Products Co., November 24 (Delaware), $1,500,000. M. L. Horty, M. C. Kelly, S. L. Mackey—all of Wilmington, Delaware. Delaware agent, Delaware Charter Guarantee & Trust Co., Du Pont Building, Wilmington, Delaware. To manufacture rubber goods, etc.

Y. S. Skin Mechanical Tubeless Tire Co., Inc., December 26 (New York), $10,000. A. Abramson; B. Perlman, both of 299 Broadway; H. Y. Skin, 55 Barclay street—all in New York City. To manufacture tires, etc.

HIGHEST PRICES PAID TO RUBBER WORKERS.

Men who work in rubber factories earned the highest average wages per hour and per week in the United States in 1919 and receive the highest percentage of increase since the war began; the women rubber workers, who are less favored, receive the second highest weekly wages in the eight industries examined by the National Industrial Conference Board in its "War-time Changes in Wages."

In September, 1914, the male workers in rubber factories were receiving 28.8 cents an hour and $14 a week; the boot and shoe men did better, both by the hour and week; and the metal workers received a shade more an hour. In September, 1918, the rubber workers received 57.5 cents an hour and $28.60 a week and in March, 1919, 61.2 cents an hour, the highest hourly earnings in any of the industries, and $29.35 cents a week, far ahead of all other workers. The figures in the same period for the men cotton workers, who receive the lowest wages, were 18.9 cents per hour and $10 per week in September, 1914; 38.5 cents and $20.60 a week in September, 1918, and 38.9 cents an hour and $17.10 a week in March, 1919.

The rubber men received 100 per cent increase in 1918 and 112 per cent in 1919 over 1914 in the hourly rate of pay, but 104 per cent increase in 1918 and 110 per cent in 1919 in weekly wages over 1914. The percentages of increase per hour for the cotton men was 104 in 1918 and 106 in 1919 over 1914, but it left them still lowest in the scale; while the percentage of increase per week, which was 106 in 1918 dropped to 71 in 1919. The chemical workers in the same time rose from 23.2 cents an hour in 1914 to 44.5 cents in 1918 and 49 cents in 1919; their weekly wages increased from $12.85 in 1914 to $26.80 in 1918, dropping to $26.20 in 1919.

Women workers in rubber in 1914 received 17.4 cents an hour; this became 24.7 cents in 1918 and 29.2 cents in 1919, leaving them the worst paid per hour in any of the eight industries examined and with the lowest percentage of increase. Their weekly wages of $9.25 were the highest paid to women in 1914; the increase to $12.94 in 1918 left them at the bottom of the list, while the further increase to $14.90 in 1919 makes them second only to the silk workers. In the same time the women cotton workers, earning 15.2 cents an hour in 1914, rose to 30.4 cents in September, 1918, and to 31.2 cents in March, 1919; their average weekly earnings of $7.70 in 1914 became $15.37 in 1918 and sank to $12.75 in 1919.

The percentage increases in earnings of piece workers were greater than those of time workers and the actual earnings were also greater in many cases.

VICE-PRESIDENT OF ARTHUR W. STEDMAN, INC.

ARTHUR W. STEDMAN, JR., mining engineer and crude rubber broker, was born February 15, 1894, in Brookline, Massachusetts, which town was founded by his ancestor in 1705. First attending Volkman's School for Boys, he later entered the Groton School, where he prepared for Harvard College.

A. W. STEDMAN, JR.

His mind being centered on making mining engineering his life's work, he decided upon a course at the Colorado School of Mines, where he passed three years, and was in his last term when the World War was declared.

He served with the Colorado Corps of Engineers during the summer of 1916, took examinations for the Regular Army that fall, and was commissioned a second lieutenant. After further training at Camp Leavenworth he became first lieutenant. He was later transferred to Fort Oglethorpe where he served until January, 1918, when he received an honorable discharge for illness. After recovery, two months later he enlisted in the Tank Corps, soon becoming sergeant and accompanying the corps to France, where he served until June, 1919.

After pursuing the engineering profession for a time he entered the crude rubber business, and was made vice-president of the well-known firm of Arthur W. Stedman, Inc., 68 Broad street, New York City, of which his father is president.

PERSONAL MENTION.

R. W. Ashcroft has resigned as advertising manager, effective December 31, 1919, of the United States Rubber Co. He states that his future business plans have not been decided upon.

H. Tyler Kay, who has been engaged in advertising work during the last seven years with the Milwaukee "Journal," and with the Nemours Trading Corp., New York, and who was discharged from the army a short time ago, has been made advertising manager of The Madison Tire & Rubber Co., Inc., New York City.

George H. Jacobs, Akron manager for L. H. Butcher Co., Inc., was in New York City last month on a combined business and pleasure trip.

I. F. Baker of the Westinghouse Electric International Co., who has been located in the New York office for the past two years, is now on his way to Tokio, Japan, where he will act as a special representative of the company.

Charles C. Spies has been appointed district sales representative for the Faultless Rubber Co., Ashland, Ohio, in the Philadelphia territory, with headquarters at 887 Drexel Building, Philadelphia, Pennsylvania. He formerly traveled for the company in Ohio, New York, and New England.

Henry E. Balsley has been appointed manager of the Chicago office of the Hooven, Owens, Rentschler Co., Hamilton, Ohio.

E. S. Cooley has been appointed manager of the New York office of the Hooven, Owens, Rentschler Co., Hamilton, Ohio.

W. W. Wildman, former president and general manager of the Portage Rubber Co., Akron, Ohio, is organizing in Detroit, Michigan, a new $10,000,000 corporation to be known as the Wildman Rubber Co.

EASTERN NOTES.

The General Electric Co., Schenectady, New York, has acquired the plant of the Symington Works, Leighton avenue, Rochester, New York, comprising about 125,000 square feet of floor space, to be used for the manufacture of electrical goods. The company will also open a factory at Providence, Rhode Island, for the manufacture of small electrical devices, and will construct a large machine shop at Erie, Pennsylvania.

The Link-Belt Co., Nicetown, Philadelphia, Pennsylvania, is planning a new office at its Philadelphia works, the present office to be remodeled into a shop extension.

The Consumers Tire & Rubber Co., 16 Beaver street, New York City, has increased its capital stock from \$100,000 to \$1,-500,000.

The Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, will build a two-story addition to its plant at Essington, in the same state, 130 by 500 feet, at an estimated cost of \$500,000, including equipment.

The Westmoreland Chemical & Color Co. has removed its general office to the southeast corner of 22d and Westmoreland streets, Philadelphia, Pennsylvania.

The Vulcan Rubber Co., Erie, Pennsylvania, will build a factory addition for the manufacture of cord tires on West Lake Road. The addition will be two stories high, of steel, brick, and concrete, and the machinery and equipment have been ordered. The company is at present at work on a government order for tires to equip all postoffice automobiles east of the Mississippi river.

The Achilles Rubber & Tire Co., Inc., Binghamton, New York, which was reorganized in January, 1919, has been producing tires, tubes, mechanical goods and belting since August of this year, mostly for export. Plant additions are now being made which will give a capacity of 800 tires and tubes daily. The mechanical department is also being enlarged and plans are being drawn for further factory additions. The officers of the company are H. J. Smith, president; A. W. Caney, vice-president; G. L. O'Neil, secretary and treasurer.

The Hooven, Owens, Rentschler Co., Hamilton, Ohio, manufacturer of steam engines, compressors, etc., has opened branches at 2129 Land Title Building, Philadelphia, Pennsylvania, and in Richmond, Virginia, in charge of C. M. Decker and E. H. Fairchild, respectively.

The Motor and Accessory Manufacturers' Association will hold its annual banquet at the Hotel Commodore, New York City, Wednesday, January 7, at 7.30 p. m.

The following members of the Motor and Accessory Manufacturers' Association allied to the rubber industry will exhibit at the New York automobile shows: Breeze Manufacturing Co., Essankay Products Co.; General Electric Co.; Morse Chain Co., A. Schraders' Son, Inc.; C. A. Shaler Co.; Story Rubber Co.; Westinghouse Electric & Manufacturing Co.; William-Seaver-Morgan Co.

The Atlantic Rubber Manufacturing Corp., 239 Fourth avenue, New York City, has acquired the entire capital stock of the Traun Rubber Co. and consolidated its business with its own, taking over and assuming all the assets and liabilities of the acquired business. The officers and management of the Atlantic company will remain the same.

As the first of a number of welfare projects in the interest of its employes, the Ajax Rubber Co., New York City, announces that an extensive insurance plan has been put into effect. The policies cover every individual in the organization whose service extends over a period of three months or more. By this insurance, which is the gift of Ajax to its workers, every man and woman in both the Trenton, New Jersey, and Racine, Wisconsin, factories, and sales offices, and all other people in general will benefit

THERMOID SALES MANAGER.

John T. Spicer, who has been made sales manager of the Thermoid Rubber Co., Trenton, New Jersey, is a splendid example of the self-made man with an inflexible determination to succeed.

John T. Spicer.

After completing grammar school and attending high school two years, he entered Exeter Preparatory School, where he remained two years. Part of one year he attended States School, and from there entered the employ of the Maddock Pottery Co., of Trenton, as stock clerk. During this period he attended night school for one year and then took a finishing course at a West Philadelphia, Pennsylvania, school of business, later completing a full course in advertising in a correspondence school.

Winning promotion to the office of the Maddock Pottery Co., he remained there three years, when he was made a salesman in the western territory for four years. Meanwhile between trips he assisted in compiling the firm's catalogs and in planning its advertising.

Early in 1918 he resigned to become assistant advertising manager of the Thermoid Rubber Co. In October of the same year he was promoted to the position of advertising manager and has since assumed the duties of sales manager.

THE RUBBER TRADE IN NEW JERSEY.

By Our Regular Correspondent.

TRENTON NOTES.

The coal situation kept rubber manufacturers guessing for a few days and resulted in the Empire Rubber & Tire Corp. appealing to the Government for a supply of bituminous fuel to keep the plant going. The company had but a few days' supply on hand, several carloads having been commandeered by the United States Railroad Administration. The Government finally released the coal. The other Trenton rubber concerns had larger supplies on hand, but were preparing to operate only three days a week when the ban was lifted.

Charles Howell Cook, treasurer of the Hamilton Rubber Manufacturing Co., Trenton, has been made president of the Mercer County Tuberculosis League. Mr. Cook recently devoted considerable time to visiting factories with physicians to give talks on the health of workmen and the improvement of sanitary conditions. Many of the Trenton rubber concerns also contributed financially towards the work.

Henry Young, of Trenton, has been made vice-president of the Hamilton Rubber Manufacturing Co. to fill the place made vacant by the death of William H. Servis. No other changes were made in the management.

The office force of the Thermoid Rubber Co., Trenton, held its annual Christmas dinner and minstrel show at Hildebrecht's Restaurant on December 22. About 150 persons were present, including Robert J. Stokes, secretary of the company; John T. Spicer, general sales manager, and Edmund W. Craft, purchasing agent. Harry McGowan, Warren C. Hunt, Fred C. Birkholtz, Harry W. Searfoss and Mr. and Mrs. A. H. Greywacz contributed vocal and instrumental selections. Miss Marjorie Pilger was chairman of the general committee.

The Globe Rubber Tire Manufacturing Co., Trenton, has contracted with I. Harper Clayton for a one-story building adjoining the plant on Prospect street, to cost \$6,300.

The Ajax Rubber Co., Trenton, has taken out a permit for the erection of an addition to the plant on Breunig avenue. The new structure will be three stories high, 60 by 350 feet, and will cost $39,000. The plans have been drawn and the work will be started as soon as bids are received and contracts let.

Clifford H. Oakley, president of the Essex Rubber Co., Trenton, has been made president of the Trenton Council of Boy Scouts of America. Mr. Oakley has long been interested in all kinds of welfare work for boys. He was chairman for Trenton in last spring's drive in behalf of the National Association of Scouting, and pushed Trenton to the head of the list of New Jersey cities. Mr. Oakley is especially interested in water sports for boys and he will now help in the formation of a sea scout crew at Trenton. Charles Howell Cook, treasurer of the Hamilton Rubber Manufacturing Co., has contributed a clubhouse along Sanhicak Creek for the use of the boys.

The annual meeting of the Trenton Rubber Manufacturers' Association, held on December 8 at the Trenton County Club, was largely attended. The association comprises Trenton, Philadelphia and Wilmington, Delaware, rubber manufacturers. Following a business meeting a banquet was served. Important business relating to the rubber industry was transacted and the following officers were elected: president, John S. Broughton, of the United & Globe Rubber Co.; vice-president, Charles E. Stokes, of the Home Rubber Co.; secretary, Robert J. Stokes, of the Thermoid Rubber Co.; treasurer, Alfred Whitehead, of Whitehead Brothers' Rubber Co.

The Pocono Rubber Cloth Co., recently chartered with a capital of $500,000, will soon engage in the manufacture and sale of rubber goods at 137 East State street, Trenton. Robert R. Gulliver, of Trenton, and Neil E. Bowman and Theodore S. Cart, both of Mount Vernon, New York, are the incorporators.

MISCELLANEOUS NEW JERSEY NOTES.

The United States Rubber Co., New Brunswick, New Jersey, has come to the aid of its employes and is selling to each two pounds of brown sugar. Bags containing 1,200 pounds were sent to the factory for distribution.

The Howe Rubber Co., of New Brunswick, New Jersey, manufacturer of tires and tubes, is offering for sale 10,000 shares of preferred stock and a like amount of common stock. The company's earnings during the past year are stated as $2,500,000.

William Henry Sayen, Jr., treasurer of the Mercer Rubber Co., Hamilton Square, New Jersey, has just been awarded the Croix de Guerre by Marshal Petain for extreme bravery while under fire. Mr. Sayen was a Y. M. C. A. worker and was constantly under bombardment during his stay overseas. Osgood Sayen, brother of W. H. Sayen, Jr., who was formerly with the Mercer Rubber Co., is now an officer in the French navy.

Philip H. Lang has been promoted from the position of New York branch manager to that of district manager for the Empire Rubber & Tire Corp., Trenton.

Frank Wallace Servis, Bloomfield, New Jersey, has been made administrator of the estate of his father, William H. Servis, who died some time ago. Mr. Servis owned a beautiful home in Trenton and other real estate.

The Duratex Co., Newark, has awarded a contract to the American Concrete Steel Co. for the erection of a rubber mill to cost $175,000.

The Rydon Tire & Rubber Co., Asbury Park, New Jersey, has plans drawn for a brick and steel factory to cost $100,000.

Robbers recently burglarized the store of the Joseph Sesta Tire Co. at Red Bank and escaped in a motor truck with $30,000 worth of automobile tires.

The plant of the Johnson Rubber Co., situated in Ewing township, New Jersey, was destroyed by fire on December 12. Antonio De Piano, manager of the plant, was filling a gasoline tank when it exploded. He was fatally burned and died a week later. The plant was one story and measured 60 by 60 feet. About 250 gallons of oil were burned. The plant was owned by the Ivens Machine Co. and will be rebuilt.

The Weldon Roberts Rubber Co., manufacturer of stationers' sundries, Newark, New Jersey, reports that notwithstanding the disadvantage to the foreign buyer in the matter of exchange, the company is experiencing an unprecedented demand for its products, particularly erasers, in foreign countries. Large shipments have recently been made to Italy, Argentina, Great Britain, Russia, Japan, Australia and China.

Fifteen hundred and one shares of stock of the Boonton Rubber Manufacturing Co., Boonton, New Jersey, were sold November 25, 1919, to R. W. Seabury for $1,501 by Francis P. Garvan, Alien Property Custodian.

THE RUBBER TRADE IN MASSACHUSETTS.

By a Special Correspondent.

NEW ENGLAND has always been the rubber footwear center of the United States, and the State of Massachusetts takes the lead. No less than 85 per cent of all the rubber footwear made or worn in the United States is produced in the three states of Massachusetts, Rhode Island and Connecticut, and 50 per cent comes from Massachusetts alone. About half of the rubber footwear manufactured is the product of female labor.

The six principal companies manufacturing rubber footwear in Massachusetts are the Hood Rubber Co., Watertown, employing 9,100 persons for the manufacture of both footwear and tires; the American Rubber Co., Cambridge, employing 3,200 persons; the Boston Rubber Shoe Co., Malden and Melrose, employing 3,000 persons; the Converse Rubber Shoe Co., Malden, employing 1,700 persons for the manufacture of both footwear and tires; the Apsley Rubber Co., Hudson, and the Woonsocket Rubber Co., Millville. Of these the American Rubber Co., the Boston Rubber Shoe Co. and the Woonsocket Rubber Co. and subsidiaries of the United States Rubber Co., which has 50 factories of one sort or another, of which 17 in various states are largely devoted to the manufacture of footwear.

The largest single rubber footwear factory in the world, however, is that of the Hood Rubber Co., which has an average capacity of 65,000 pairs daily and has run a ticket as high as 72,000 pairs, and makes 20 per cent of all the rubber footwear produced in the United States. The Malden and Melrose plants of the Boston Rubber Shoe Co. also have a daily capacity in excess of 60,000 pairs. The Apsley Rubber Co. has one of the most completely equipped rubber footwear plants in the country, with a capacity of 20,000 pairs daily.

The 12,000 employes at the West Lynn plant of the General Electric Co. are being insured at the company's expense. Each man or woman in the company's employ one year will be insured for $500; two years, $750; three years, $1,000; four years, $1,250, and five years or more $1,500. Should an employe leave the company's service the insurance ceases, but may be continued through payments by the individual insured.

A 100 per cent American plant by September, 1920, is the goal which the Boston Woven Hose & Rubber Co., Cambridge, has set for itself. Very few aliens have been hired during December, and the policy of giving preference to American citizens is bringing satisfactory results. It may take a little longer to fill the job, but the job stays filled longer.

Twice a week, during the noon hour, an Americanization class is held in the recreation room of the plant for the benefit of

foreign-born employes, and the firm is pleased to render every assistance possible to such aliens in taking out citizenship papers. A class of twenty-five men has been enrolled and additional classes will be formed as soon as teachers can be secured.

Guy D. Niles, formerly manager for The Portage Tire & Rubber Co., is now in charge of the New England branch of the Gillette Tire Co., with offices and salesrooms at 587 Boylston street, Boston. Mr, Niles has grown up in the business of merchandising automobile tires and has a wide acquaintance throughout New England.

On December 9, the officers and plant managers of Everlastik, Inc., 52 Chauncey street, Boston, held a get-together meeting at the Boston City Club during which many ideas for the improvement of working conditions in the several mills were discussed. Those present were B. T. Martin, president; John Page, treasurer; W. B. Spencer, general manager; Charles Stretch, sales manager; Walter Martin, H. J. Martin, L. B. Chisholm, Arch. Martin, Alfred Martin, Sol. Kendrick, Henry Turner, Walter Dalby, Samuel Lounds, F. Gramelsback, A. S. Howard, Samuel Kendrick, W. Painter, Thomas Dreier, Wilwyn Herbert and Charles Lake.

Samuel K. Nason, director of vocational education in Brookline, a suburb of Boston, announces evening classes in automobile instruction, free to residents of Brookline, which will place students in a position to qualify for a chauffeur's license from the state. The care and repair of tires form part of the course, which is to be conducted by Robert V. Dallison, instructor for the Coast Artillery Motor Corps and the Y. M. C. A. Automobile School.

In order to provide additional capital to meet the increased demand for George Grow cord and fabric tires, the George Grow Tire Co., 323 Columbus avenue, is offering to the public 50,000 shares of non-assessable common stock at par, $10 per share. The factory at Canton Junction is producing 600 tires weekly, and as this output is consistently oversold the capacity will be increased to 6,000 tires weekly. The firm's product is marketed through a chain of stores operating in many leading New England cities.

L. J. Mutty, of the L. J. Mutty Co., manufacturer of automobile top fabric, Boston, has left for a sojourn of several months on the Pacific Coast, taking his motor car and golf sticks with him. W. N. Shelton, general manager of the company, reports that the demand for "Dridek" on the part of leading automobile manufacturers has quadrupled and that the export business is far above normal.

The Worco Tire Co., Worcester, also distributer for the Paige automobile, has been purchased by the R. C. Cann Co., of Boston. In the spring the new concern will build a large garage and service station near the present salesrooms.

NEW AJAX PLANT AT SANDUSKY, OHIO.

Horace DeLisser, president of the Ajax Rubber Co., Inc., New York City, recently announced that a new Ajax factory will be erected in Sandusky, Ohio, where ninety acres of land have been secured. The erection of the new plant will begin at once and by the latter part of 1920, tire production will be well under way. This is the third factory for Ajax, the others being in Trenton, New Jersey, and Racine, Wisconsin.

A housing plan for employes is being developed along with other welfare activities. Between 1,000 and 1,500 homes for Ajax workmen will be erected in Sandusky. Details for this housing plan which will be along lines similar to the housing project already under way at Racine, are now being worked out by the Ajax Industrial Welfare Department.

Discussing the plans for the new Ajax plant, Mr. DeLisser expressed his keen appreciation of the cooperation of the Sandusky Chamber of Commerce, which organization played an important part in making the project a reality.

MANAGER OF THE MALAY RUBBER CO.

Owen Moynihan, for the past two years general sales manager of the Amazon Rubber Co., Akron, Ohio, has resigned to assume active management of The Malay Rubber Co., which is being organized by distributers and dealers in all parts of the country for the purpose of manufacturing and merchandising a high-grade tire in a new plant to be built at Cleveland, Ohio.


Owen Moynihan.

Before his Amazon connections, Mr. Moyniham was eastern district representative of two Akron rubber companies, and previous to that time was in the offices of distributers. His broad understanding of tire distribution eminently fits him for his new position. In The Malay Rubber Co. will be associated with him tire experts to care for every phase of manufacture, production, sales and advertising.

CHAIRMAN OF GOODYEAR'S BOARD OF CONTROL.

W. D. Shilts, assistant secretary of The Goodyear Tire & Rubber Co., Akron, Ohio, and chairman of the board of control, was graduated from Mt. Union College and began the study of law in Cleveland. Finding that it would be necessary to get work to pay his way while studying in 1904, he answered in person an advertisement for a stenographer placed by C. W. Seiberling in a Cleveland paper. Arriving in Akron, he was immediately engaged as the personal secretary of the then manager of the automobile tire department, at a time when the Goodyear output was 25 tires a day.


W. D. Shilts.

Close application and a comprehensive grasp of details brought him promotion after four months. He was placed in charge of the correspondence of the tire department, and at the end of two years a realization of his opportunities with the Goodyear organization led him to abandon the thought of a career at the bar.

From that time his rise was rapid. He was soon made assistant to G. M. Stadelman and chosen as head of the automobile tire department, then selected as manager of the salesmen's department. His broad vision, coupled with exceptional executive ability, quickly brought further recognition, and he was made chairman of the board of control. Recently he was made assistant secretary, and so became one of the officials fourteen years after joining the company at the bottom of the ladder. Mr. Shilts will continue to act as chairman of the board of control.

THE RUBBER TRADE IN OHIO.

By Our Regular Correspondent.

MORE THAN 200 MEMBERS of the Detroit and Cleveland sections of the Society of Automotive Engineers held a two-day session at Akron, Ohio, December 1 and 2, as the guests of The Goodyear Tire & Rubber Co. The meeting was held for the purpose of presenting technical information pertaining to the application of pneumatic tires to motor trucks. The visitors witnessed a demonstration of a new development in truck design, the tandem axle construction—Goodyear's contribution to the truck industry.

Monday evening the engineers were guests at a banquet at which F. A. Seiberling, president of the company, and P. W. Litchfield, factory manager, made far-sighted predictions as to the future of the motor truck industry. Mr. Seiberling declared that within three years the solid tire would be obsolete and that the fabric tire would soon be supplanted by the pneumatic cord tire. Mr. Litchfield stated that the trolley car must go as a means of transportation—to be succeeded by the motor bus.

The visitors were taken on tours of the Goodyear factory, saw many interesting exhibits and enjoyed athletic sports in the company gymnasium. Four of them, selected by lottery from the 200 delegates, made a balloon flight with Ralph H. Upson, the Goodyear aeronautical engineer.

The Goodyear committee in charge was composed of C. R. Johnson, C. M. McCreery, J. E. Hall, W. S. Wolfe and E. R. Preston.

AKRON NOTES.

The Miller Rubber Co., Akron, has followed the example of the Firestone Tire & Rubber Co. in establishing a cooperative store for its employes. At present the store is handling only a comparatively small line of merchandise, but the plans of the company include its expansion until all commodities usually sold in a general store are included. A. R. Kiester is manager of the store.

The General Tire & Rubber Co., Akron, is completing the second addition to its plant made during the past six months. The addition is 120 feet long and 60 feet wide. Officials of the company estimate that their business this year will be considerably over $5,000,000.

The B. F. Goodrich Co. has erected garages near its plant where more than 500 employes can house their automobiles while they are at work.

George W. Sherman, for eighteen years connected with the reclamation department of The B. F. Goodrich Co., has resigned and will leave the employ of the company the first of the coming year. During the past few years he has developed the Akron Salvage Co., a company formed to save waste unreclaimable through the ordinary channels, to such an extent that he will devote practically all his time to this work.

A machine gun company belonging to the Ohio National guard has been organized by employes of The B. F. Goodrich Co.

The B. F. Goodrich Co. recently announced that at the end of the year all the salaried employes of the company would receive bonuses of 25 per cent of their salary. More than 6,000 employes will thus receive bonuses totalling $2,000,000. Wage advances have been made during the course of the year so that no general bonus for the employes in the factory is anticipated.

At present more than 2,300 persons of foreign birth are taking the Americanization courses in the schools conducted in the rubber factories and the public schools under the direction of E. C. Vermillion, formerly connected with the Firestone Tire & Rubber Co. There are 128 classes served by 105 specially trained teachers.

The Summit Mold & Machine Co., Akron, will build a machine shop in the near future.

Work has begun on a warehouse for crude rubber and manufactured products and a new machine shop for the Firestone Tire & Rubber Co. in connection with buildings 32 and 33. The new buildings will cost approximately $185,000 and the company hopes to have them ready by the first of the year.

The Portage Rubber Co. has broken ground for its new $200,000 factory building, the first unit of an entirely new plant. The building is to be 80 by 200 feet, three stories high, and is to be built with provisions for the addition of two more stories as soon as business warrants. At a recent meeting of the stockholders the announcement was made that business had increased 25 per cent since the signing of the armistice.

Ground has been broken for the first unit of the Doyle Tire & Rubber Co.'s plant on a 50-acre site recently purchased in Akron.

The new concern was recently organized with a capitalization of $300,000 by members of the family of Judge D. A. Doyle. The first factory building will be 54 by 110 feet.

The Phoenix Rubber Co. has received from the city building department, of Akron, a permit to erect a three-story brick building as an addition to its present plant. The addition will cost approximately $60,000 and will be 60 by 120 feet.

The Miller Rubber Co., Akron, has announced plans to build a $1,750,000 power plant and other factory extensions near Kenmore, which is in the greater Akron territory.

The American Rubber & Tire Co., Akron, has arranged to call in $350,000 worth of 7 per cent preferred stock outstanding before recapitalizing next spring for $2,000,000. The stock is being called in at 107.

The strike of the bituminous coal miners did not materially affect the rubber factories of Akron or vicinity because each of the companies had sufficient coal to last at least 30 days when the strike was declared. Business was hampered somewhat, however, by an embargo placed on incoming freight due to congestion in the local yards, making it difficult to get shipments of materials.

During the first part of December the Goodyear Tire & Rubber Co. was granted permits for additions to its factory to cost approximately $1,500,000.

The largest single shipment of crude rubber ever received in Akron was consigned to The Goodyear Tire & Rubber Co. in December, and amounted to 3,000,000 pounds, valued at $1,500,000.

The business of The Goodyear Tire & Rubber Co. during the past year amounted to approximately $250,000,000, it was announced at the annual meeting of the directors and stockholders.

F. A. Seiberling, president of the company told the stockholders that in his opinion the business of the company would be twice that amount for the year 1920. Profits of the company amounted to $23,277,245.29. During the preceeding year the sales of the company totaled $131,247,382.45 and the profits $15,388,190.

At the meeting of the directors the same officers who have served during the past year were reelected, except that W. E. Palmer was elected secretary besides being reelected treasurer. W. D. Shilts was elected assistant secretary.

Announcement has been made that The Goodyear Tire & Rubber Co., Akron, will soon erect a $200,000 dormitory for women near the plant. The building will house 175 women, it is estimated.

William O'Neill, a member of the welfare department of The Goodyear Tire & Rubber Co., and William Kroeger, manager of the Coventry Land & Improvement Co., a subsidiary company of the Firestone Tire & Rubber Co., have been elected members of the Akron city council.

The commercial representatives of England, France, Italy and Belguim, who visited the United States and attended the world trade convention held at Atlantic City, spent November 15 inspecting the rubber plants of Akron and were entertained at the Portage Country Club in the evening.

The Chamber of Commerce has prepared statistics concerning the business of Akron which indicate that during the past year the output of local industries amounted to $522,436,020, and the pay-roll of the city to $117,974,890, and the capitalization to $272,853,770. The production of the city at present is estimated at approximately 200,000.

The employes of the Akron rubber factories contributed the major portion of the $1,500,000 placed in the peace chest which has been organized to finance thirty-three welfare organizations of the city.

SOUTHERN DELEGATION OF AUTOMOBILE DEALERS AT AKRON.

Early in December a delegation of forty Chandler and Cleveland automobile dealers from Oklahoma, New Mexico, Panhandle Texas and Arkansas was entertained by The B. F. Goodrich Co., and the manufacture of tires demonstrated from start to finish. The trip was conducted by the Markham Motor Co., Oklahoma City, Oklahoma, the party traveling in a special Pullman coach. Automobile, tire and accessory factories were also visited in St. Louis, Indianapolis, Cleveland, Detroit and Chicago. The dealers returned to their respective territories fired by the optimism of the great automobile centers and better equipped to demonstrate cars and talk tires convincingly and profitably.

At the recent annual meeting of the stockholders of the Williams Foundry & Machine Co., Akron, Ohio, the following officers were elected: F. E. Halcomb, president; S. F. Ziliox, vice-president; G. Carl Dietz, treasurer; William J. Slater, secretary and assistant treasurer; Charles Reymann, Charles Herberich and A. W. Burnett, additional directors.

The company's plant is working to capacity on vulcanizers and miscellaneous machinery for the building and repair of tires. The demand for repair equipment is especially good at this time.

M. M. Whorley has been appointed assistant sales manager of The Mason Tire & Rubber Co., Kent, Ohio.

The Columbia Tire & Rubber Co., Columbiana, Ohio, will build a new plant in Mansfield, to be known as Plant No. 1. Stock to the extent of $500,000 has been issued and disposed of to provide funds for the purpose. The company's general offices will be removed to the new building as soon as completed.

The Henderson Tire & Rubber Co., Inc., Bucyrus, Ohio, is moving to its new plant on West Goodale street, Columbus, where it expects to produce about 1,500 tires daily. C. O. Henderson is president and treasurer Joseph Friedman, vice-president; and George C. Riley, secretary.

The Ultimate Tire & Rubber Co., Cleveland, Ohio, has bought a site of 12.6 acres of land at Collamer and East 152d street, touching the main line of the Nickel Plate railroad, where it will build its plant.

Ground has also been broken and construction begun on the buildings for the Excel Rubber Co., at Wadsworth, near Akron. The company recently organized with a capitalization of $600,000 of which only $100,000 is to be sold at this time, and that sale restricted to the citizens of Wadsworth.

R. C. Holman has been placed in charge of all blowing engines of the Hooven, Owens, Rentschler Co., Hamilton, Ohio.

The McLean Tire & Rubber Co., East Liverpool, Ohio, is completing a factory addition, 100 by 150 feet, two stories in height, of brick and steel construction, into which it expects to move about February 1, when production will be increased to average 1,000 tires daily. On December 1 the company began the manufacture of McLean cord casings, which completes its line of tires and tubes.

The Knox Tire & Rubber Co., Mt. Vernon, Ohio, will build a three-story factory building, 100 by 225 feet, to cost about $170,000.

The Ashland Tire & Rubber Co., Ashland, Ohio, will build a new tire plant.

MID-WESTERN NOTES.

By a Special Correspondent.

THE GENERAL ELECTRIC Co., Schenectady, New York, will build a new factory at Decatur, Indiana. 260 by 360 feet, for which site was recently purchased.

The Sewell Cushion Wheel Co., Detroit, Michigan, has bought 10½ acres of land at the corner of Harper avenue and the Detroit Terminal Railway, where it will immediately erect dry kilns and warehouses. Manufacturing for the present will continue at the company's building at Gratiot and Beaufait avenues.

The Michelin Tire Co., Milltown, New Jersey, has opened factory branches at 514 Mulberry street, Des Moines, Iowa, and at 26 West Woodbridge street, Detroit, Mich., both to be under the supervision of R. B. Tracy, district manager. The State of Iowa, eastern Michigan and northwestern Ohio territory will be covered.

A. Plamondon Manufacturing Co., 12-24 North Clinton street, Chicago, Illinois, is building a one-story machine shop and foundry on its property at 53d street and Western avenue, to cost aproximately $400,000. This company manufactures gearing and friction clutches as well as special machinery for the rubber trade.

The Gillette Rubber Co., Eau Claire, Wisconsin, which bought the business of the Chippewa Rubber Co., of the same city, some months ago, is continuing to manufacture the same products, namely, waterproof material for raincoats.

In order to take care of the increasing demand for its malleable iron chains for elevating, conveying and power transmission purposes, the Link-Belt Co., Chicago, Illinois, is completing its Belmont foundry at Indianapolis, Indiana, as originally laid out. The new building will be about 400 by 70 feet, and the necessary rolling mills, sand blast and other equipment will be installed as soon as possible, also a furnace of 15 tons capacity.

The Montana Cord Tire Co., Inc., 409 Central avenue, Great Falls, Montana, manufacturer of Montana cord and fabric tires, was incorporated in that state on May 28, 1919, with a capitalization of $500,000. It also intends to manufacture inner tubes and rubber sundries. The officers are: Clarence J. Drope, vice-president; J. R. Swan, secretary and treasurer. The office of president is vacant at present. The concern has bought a building 175 by 60 feet, near the Missouri river and two transcontinental railroad lines, and expects to place its tires on the market about May 1, 1920. The Montana tire is of heavy construction, having three layers of cord laid diagonally and individually insulated, with the intent to adapt it to the conditions of local roads. There is also a special patented attachment to the bead of this tire.

The International India Rubber Corp., South Bend, Indiana, has broken ground for a factory addition for the installation of three new mixing mills, one large-size calender, and three new vulcanizers, which it is expected will bring the capacity up to 800 tires and tubes daily.

The Goodyear Tire & Rubber Co., Akron, Ohio, has begun the construction of a new building at West 39th street and Winchester avenue, Chicago, to accommodate the Goodyear organization in that city. The building will have four stories and basement and be of reinforced concrete, containing 200,000 square feet of floor space. A private track and tunnel will be built for incoming freight, giving access to the central freight station and express receiving room.

THE PARKER TIRE & RUBBER CO.

A distinctive feature of the new factory of the Parker Tire & Rubber Co. at Indianapolis, Indiana, is that it is all white, including the driveways, entrance posts and all the inside wood-

PLANT OF THE PARKER TIRE & RUBBER CO.

work. This is in accordance with the company's advertising scheme which starts with a white strip on the tires it manufactures and is continued in the pure white trucks and service and pleasure cars.

The Parker company claims to be the only one in the country specializing absolutely in cord tires; it makes no tubes or rubber goods of any kind, no plain tread, rib tread or fabric tires. It manufactures only the one non-skid design, which it calls a combination non-skid and rib tread. The capacity of the factory is 500 cord tires a day. The tires are almost as large as the next standard oversize and are therefore called super-size cord tires. The company's plan is to extend its business, especially in the south, having already been successful throughout the southwest territory.

ACCESSORY FIRM TO MAKE TIRES.

The A. J. Stevens Rubber Co., Kansas City, Missouri, manufacturer of tire accessories and fabric products, has entered the tire manufacturing field with the Stephens White Tread Tire, guaranteed for 6,000 miles. Inner tubes are also being produced. The present capacity of the plant is 300 casings a day, and this will be increased as new machinery is installed.

The company began in 1916 with six employes, and has outgrown two plants. Its production of blowout patches has reached 3,000,000 annually, and of fan belts 2,000,000. The capital stock was recently increased to $1,500,000, and the expansion into tire and tube making will increase the number of employes to 500 or 600.

PACIFIC COAST NOTES.

By Our Regular Correspondent.

LOS ANGELES NOTES.

C. E. HENSON, secretary to vice-president and general manager A. F. Osterloh, of the Goodyear Tire & Rubber Co., of California, has arrived in Los Angeles and assumed charge of the local office. Mr. C. Henson, who is a native of Ohio, is well acquainted with California, having spent five years in this state, during which he served as secretary to the treasurer and the board of trustees of Leland Stanford Junior University, secretary to the vice-president of the Panama-Pacific Exposition, and was also in the Goodyear office in San Francisco.

J. J. Rafferty, director of the Philippine Bureau of Commerce and Industry, was a recent visitor in Los Angeles, making the rounds of business houses to urge the importance of recognizing Manila as the American shipping base of the Orient. Mr. Rafferty pointed out that the Philippines are now exporting to the United States more than a dozen commodities, not the least of which is rubber, of which there are over 2,000 acres under cultivation in the islands.

Henry Joseph, field sales manager of the Re Miler Rubber Co., Ashland, Ohio, has closed a deal in Los Angeles by which the Western Auto Supply Agency will handle exclusively the "Re Miler," a complete interliner.

Fifteen carloads of Osler-Racine tires recently arrived in Los Angeles to supply the demand for this particular make of tires in Southern California.

Considerable discussion has arisen lately in southern California over the inflation scale adopted by the Tire and Rim Division of the Society of Automotive Engineers. The western theory seems to be that no standard inflation scale will fit all conditions—that the load carried in the rear is most important in determining the amount of air pressure, and that the road conditions alter every standard rule. H. O. Alexander, special representative of The Miller Rubber Co., Akron, Ohio, with headquarters in San Francisco, says: "According to the S. A. E. scale, a five-inch cord tire should carry a pressure of 80 pounds. Undoubtedly that may be true from the standpoint of an average pressure for maximum riding comfort, but on the splendid roads of California those figures are by no means conducive of maximum mileage. The S. A. E. scale is not definitely applicable in all cases for the simple reason that every tire should be inflated strictly according to the work it is doing."

S. S. Abrams, of Los Angeles, general manager of the Superior Tires Corporation, has secured the local distributing agency for Mohawk tires.

Howard Reed, of Los Angeles, is successor to the retail business of the Wade Tire & Rubber Co., distributers for the Canton cord and the Knight & Blackstone fabric tires on the Pacific Coast.

J. V. Mowe, assistant general sales manager of the Kelly-Springfield Tire Co., New York City, was a recent visitor in

Los Angeles during the progress of a tour of inspection in all the western territory.

Los Angeles city officials are just now wrestling with the problem of completing Municipal Power Plant No. 2 in the San Francisquito canyon by May 1, so that it will be ready to supply power to the $12,000,000 Goodyear Tire & Rubber Co.'s plant. More money is required at once, some $750,000 being needed to meet outstanding contracts on Plant No. 2 and at the Owens river gorge.

F. A. Seiberling, president of The Goodyear Tire & Rubber Co., recently arrived in Los Angeles to inspect the progress on the company's new plant. He is confident it will be completed by July 1, and declares that fully 15 per cent of the company's total output will come from the local factory. Mr. Seiberling states that other eastern tire manufacturers are preparing to locate plants here and that automobile manufacturers will follow.

Speaking of cotton prospects, Mr. Seiberling said that the development of the Salt river district has been something marvellous, the acreage having been expanded until this year there are more than 90,000 acres planted. Growers are predicting the best crop in the history of the valley. Floods have done some damage, but this will not amount to more than 15 per cent of the entire crop. The Goodyear company has bought two-thirds of the Salt river crop and would have purchased it all had that been possible.

Work on the installation of the fire-fighting facilities in the city's new cotton compress building at Los Angeles harbor has been completed and work on the first orders of cotton has already been started. Orders for the compressing of 3,000 bales were received during December, while dozens of inquiries were rceived from Imperial Valley planters. The cotton compress has a maximum capacity for 24 hours of 2,500 bales, or about 1,000 bales for an eight-hour day.

Word received in Los Angeles indicates a rapid increase in the rubber and tire vulcanizing business in Honolulu. The great influx of tourists has taxed the automobile capacity of the Hawaiian Islands to its utmost capacity. The Honolulu Rubber Works has been forced to enlarge its salesrooms and vulcanizing department. A thoroughly up-to-date tire repair department will be established.

A novel use for rubber tires was recently discovered at Long Beach, the largest city in close proximity to Los Angeles. The suspicions of the police were aroused by the frequent visits to a bicycle store, and a detective paid a visit to it.

"A little puncture," he remarked to the proprietor.

"Whata you lika, wiska or branda?" was the enigmatic reply. The detective said he was taken to the back of the shop where two tires, one full of brandy and the other of whiskey, dangled from a rack. By placing his mouth over the valve stem a most exhilarating puncture preparation could be obtained at 50 cents a swallow. The detective seized a small still operated in connection with the tire establishment.

Bruno J. Becker, general manager of the Gale Henry Comedy Co., of Los Angeles, has an invention which he hopes may serve to prevent tire thefts from which he has suffered recently. Locks on the tires proved to be of little avail, so he has concealed underneath his car a bell, which will start ringing immediately the tire is removed from the rack in the rear and continue until the battery has run down.

R. C. Schlesinger, sales manager of the Keystone Tire & Rubber Co., New York City, is in Los Angeles to spend the winter. He has seen the organization grow from one store to its present chain of 180. He will visit all the Keystone stores in the West during his visit.

J. E. Argus, of San Francisco, who has been district manager of the Goodyear Tire & Rubber Co., has been transferred to Los Angeles to become manager of the mechanical goods department. Mr. Argus joined the force in San Francisco on July 15, 1913, and became manager of the mechanical goods department on November 15, 1915. Frank E. Carroll was appointed to succeed Mr. Argus in San Francisco. Mr. Carroll has been in the employ of the company for 12 years, having entered its service on April 10, 1907. He is president of the Downtown Association and a member of the Olympic Club.

SAN FRANCISCO NOTES.

The United States Rubber Co., San Francisco, will shortly occupy larger quarters at Second and Folsom streets, where all business of the branch will be conducted.

Sam J. Turnis, general sales manager of the tire division of the Brunswick-Balke-Collender Co., New York City, has perfected plans for an active sales campaign in northern California. The Frank A. Busse Sales Co. has been appointed Brunswick tire dealer in San Francisco, Oakland, Alameda and Berkeley. San Francisco is to be the headquarters of the company in the Far West.

H. Senn, head of the tire department of Chanslor & Lyon Co., San Francisco, distributer of Lee tires, has just returned from a distributers' conference held in the Lee factory at Conshohokon, Pennsylvania, where sixty were in attendance.

The Ideal Tire & Rubber Co., Cleveland, Ohio, plans to complete its representation on the Pacific coast. A. S. Davies, treasurer, and D. C. Hathaway, general sales manager, were recent visitors in San Francisco for the purpose of appointing a northern California distributor for the Greyhound line. They visited their distributers in Spokane, Portland and Seattle.

Roy R. Meads, president of the Pacific Rubber Co., of Los Angeles, has opened a new salesroom for the company at 950 Mission street, San Francisco. P. H. Stortz, former sales manager, is in charge. The company is distributer of the Horseshoe pneumatic tires on the Pacific Coast.

The Power Rubber Co., of San Francisco, distributer of Racine tires, entertained its dealers, agents and branch managers recently. The men came from the entire territory, including Del Norte County in the north and Bakersfield in the south. After a series of business talks they were guests of the company at Tait's at the beach. Over 100 covers were spread. Horace de Lisser, president; R. Y. Cooke, general sales manager, and Robert B. Crane, manager of the material and sundries department, were present at the gathering.

MISCELLANEOUS WESTERN NOTES.

L. B. Broering, factory representative of The Mason Tire & Rubber Co., Kent, Ohio, was recently in Sacramento in connection with a large warehouse which his company is preparing to establish on the Pacific Coast.

George Bellis, recently Los Angeles branch manager of the Goodyear Tire & Rubber Co., has been promoted to the position of district manager of the northwestern district, with headquarters at Portland, Oregon. Mr. Bellis started his career with the Goodyear company as mechanical goods salesman on July 27, 1913, covering Nevada and northern California, and since that time has been one of the prominent factors in the rapid growth of the Goodyear Pacific Coast business. In December, 1914, he was appointed branch manager at Sacramento, and was there until June, 1917, when he was ordered south to take charge of the Los Angeles branch. Since Mr. Bellis has been located in Los Angeles he has taken an active part in public affairs and has become very well known to the tire trade.

The Rubber Committee of the Jamaica Agricultural Society has reported that the planting of *Castilloa* is not profitable, and that it is not advisable to continue planting the trees for shade on the cacao plantations, save in certain cases.

The Mid-West Rubber Manufacturers Association.

First Annual Meeting and Banquet.

First Annual Banquet of the Mid-West Rubber Manufacturers Association, Held at the Chicago Athletic Club, Chicago, Illinois, December 6, 1919.

The first annual meeting and banquet of the Mid-West Rubber Manufacturers Association took place at the Chicago Athletic Club on Tuesday evening, December 9. The business meeting was held at 2 P. M. on the same day and was well attended by members of the Association and their guests. After the customary routine which included reading of the minutes, treasurer's report, etc., the chairman, John W. Maguire, president of the Association, called upon several of the members for remarks relating to the various industries which they represented.

Thomas M. Gardner of the Brighton Mills spoke on the tire fabric situation and incidentally said that every indication pointed to a shortage of cord material, and advised that in the premises it might be well for manufacturers to figure on providing for other types on the ground that if an adequate supply of cord tires could not be turned out, pneumatics of some other character would naturally be substituted. He particularly inveighed against the use of low-grade cord because of its effect on the finished product.

Charles T. Wilson of Charles T. Wilson Co., Inc., said that it was his opinion there would be at least a sufficient supply of crude rubber to correspond with the amount of fabric available.

Wesley E. Wilson of the Akron Rubber Mold & Machine Co. spoke informingly on the subject of rubber molds.

The next speaker, A. G. Hanauer, president of the Washington Tire & Rubber Co., gave an attractive description of the Northwest generally and Spokane specifically as a most available location for rubber manufacturing concerns. He said that manufacturing conditions were ideal, including labor, which was one hundred per cent American.

Ohio as a rubber manufacturing center was defended by W. C. Owen of the Owen Tire & Rubber Co., who claimed that because of shipping facilities and proximity of supplies there was no superior location. W. W. Wuechter of the Nebraska Tire & Rubber Co., manifested a high regard for Omaha as a rubber manufacturing point.

The secretary read a paper on Industrial Relations from the Rubber Club of America, suggesting the cooperation of the Mid-West Association in that the combined organizations might act as a unit in facilitating relations between employer and employe.

The following nominating committee was appointed by Mr. Maguire: Clark H. Bennett, Featheredge Rubber Co., M. S. Ackles, Lincoln Highway Tire Co., F. I. Chichester, Twin Tube & Rubber Co., J. F. Benner, Electric Rubber Reclaiming Co., J. B. Gabeline, Standard Four Tire Co., and the following directors were elected:

John W. Maguire, Portage Rubber Co., John T. Christy, Hawkeye Tire & Rubber Co., C. H. Wright, Racine Auto Tire Co., George B. Dryden, Dryden Rubber Co., F. I. Chichester, Twin Tube & Rubber Co., D. M. Mason, The Mason Tire & Rubber Co. and W. W. Wuechter, Nebraska Tire & Rubber Co.

The dinner, which commenced at seven o'clock in the banquet hall of the Chicago Athletic Club was one of the happiest func-

tions of its kind. The general arrangements, including the menu, music and cabaret, were all of noteworthy class that reflected with credit the management of John W. Maguire who also officiated most acceptably as toastmaster.

The principal speaker of the evening was John Fletcher of the Fort Dearborn National Bank of Chicago, who dealt exhaustively with financial, industrial and agricultural conditions of the West. He delivered a most informing speech, which was enthusiastically applauded. The other speakers were Theodore Eugene Smith of the "India Rubber Review," who spoke in his usual happy and instructive vein which carried a strong appeal to all those present. E. F. Pfaff of THE INDIA RUBBER WORLD referred in a congratulatory manner to the marked progress of the association and the very genial character of the meeting and dinner.

Both the meeting and the banquet demonstrated that, while the Association is still in the yearling class, it is in every other respect well grown and amply constituted to rank with the best organzations of its kind. Following is a list of those attending the meeting and banquet:

MEMBERS AND GUESTS.

Ackles, M. S.	Lincoln Highway Tire Co.	Fulton, Ill.
Allen, S. D.	Racine Auto Tire Co.	Racine, Wis.
Barnes, J. P.	Cupples Company	St. Louis, Mo.
Barton, Walter C.	Dryden Rubber Co.	Chicago, Ill.
Benner, J. S.	Electric Rubber Reclaiming Co.	Barberton, Ohio.
Bennet, Clark H.	Featheredge Rubber Co.	Chicago, Ill.
Bostwick, S. E.	Gillette Rubber Co.	Eau Claire, Wis.
Brodhead, Garret, Jr.	Central Rubber Co.	Defiance, Ohio.
Buchter, O. G.	Newsom Valve Co.	St. Louis, Mo.
Castor, C. A.	Lion Tire & Rubber Corp.	Lafayette, Ind.
Chichester, F. I.	Twin Tube & Rubber Co.	Chicago, Ill.
Conners, A. V.	Horse Shoe Rubber Co.	Chicago, Ill.
Davis, A. F.	Ideal Tire & Rubber Co.	Cleveland, Ohio.
Davis, I. R.	Ideal Tire & Rubber Co.	Cleveland, Ohio.
Drake, R. E.		Indianapolis, Ind.
Dunbar, Frank J.	J. Frank Dunbar Co., Inc.	New York, N. Y.
Eyer, F. R.	Standard Four Tire Co.	Keokuk, Ia.
Fletcher, J.	Fort Dearborn National Bank.	Chicago, Ill.
Follen, P. E.	Lion Tire & Rubber Corp.	Lafayette, Ind.
Follen, Thos.	Lion Tire & Rubber Corp.	Lafayette, Ind.
Freshman, Chas.	H. Muehlstein & Co.	New York, N. Y.
Gabeline, J. B.	Standard Four Tire Co.	Keokuk, Ia.
Gardner, Thos. A.	Brighton Mills	Passaic, N. J.
Gereke, Edw. G.	Gereke-Allen Carton Co.	St. Louis, Mo.
Hanauer, A. G.	Washington Tire & Rubber Co.	Spokane, Wash.
Harrah, W. F.	National-Standard Co.	Niles, Mich.
Harris, S. W.	The Akron Rubber Mold & Machine Co.	Akron, Ohio.
Hayes, C. W.	Dykes Tire Machine Co.	Chicago, Ill.
Henderson, H. H.	F. R. Henderson & Co.	New York, N. Y.
Hern, Emil	Pierce Wrapping Machine Co.	Chicago, Ill.
Hoffman, Chas.	The Mansfield Tire & Rubber Co.	Mansfield, Ohio.
Horn, F. J.	Fred. Stern & Co.	New York, N. Y.
Jenkins, W. C.	"The New York Commercial".	New York, N. Y.
Kendall, J. A.	J. A. Kendall	Akron, Ohio.
Lahey, F. T.	Poel & Kelly	Akron, Ohio.
Le Pan, L. N.	C. T. Wilson Co., Inc.	New York, N. Y.
Maguire, J. W.	The Portage Rubber Co.	Akron, Ohio.
Matthias, J., Jr.	Mineral Point Zinc Co.	Chicago, Ill.
Meyer, E. T.	F. R. Henderson & Co.	New York, N. Y.
Mock, D. A.	Raw Products Co.	New York, N. Y.
Morgan, D. M.	C. J. Tagliabue Manufacturing Co.	Brooklyn, N. Y.
Muehlstein, Chas.	H. Muehlstein & Co.	New York, N. Y.
Oscars, E. B.	The Majestic Tire & Rubber Co.	Indianapolis, Ind.
Owen, W. C.	The Owen Tire & Rubber Co.	Bedford, Ohio.
Parker, Paul R.	Parker Tire & Rubber Co.	Indianapolis, Ind.
Parkin, W. H.	National-Standard Co.	Niles, Mich.
Pfaff, E. F.	"The India Rubber World".	New York, N. Y.
Pough, F. H.	Southern Acid & Sulphur Co.	St. Louis, Mo.
Puhlman, C. M.	J. H. Lane & Co.	New York, N. Y.
Ramsay, H. W.	Cupples Company	St. Louis, Mo.
Reeves, Geo. C.	Dryden Rubber Co.	Chicago, Ill.
Roberts, Preston E.	The Perfection Tire & Rubber Co.	Fort Madison, Ia
Rutter, Frank S.	Chas. E. Wood	New York, N. Y.
Sawyer, Chas. F.	Sioux City Tire & Manufacturing Co.	New York, N. Y.
Smith, Theo. E.	"The India Rubber Review".	Akron, Ohio.
Smith, Mark L.	Stresen, Reuter & Hancock.	Chicago, Ill.
Stanley, J. Richard.	J. Frank Dunbar Co., Inc.	New York, N. Y.
Stenson, C. C.	Wilson Tire & Rubber Co.	Springfield, Ill
Stepan, A. C.	The Roessler & Hasslacher Chemical Co.	New York, N. Y.
Stern, Alfred	H. Muehlstein & Co.	New York, N. Y.
Stilwell, W. H.	Eclat Rubber Co.	Cuyahoga Falls, Ohio
Syfers, R. H.	The Majestic Tire & Rubber Co.	Indianapolis, Ind.
Taveniere, C.	Chas. E. Wood	New York, N. Y.
Todd, W. W.	Mid-West Rubber Manufacturers Association	Chicago, Ill.
Tompkins, A. G.	Sioux City Tire & Mfg. Co.	New York, N. Y.
Tumpyer, Julius	A. Daigger & Co.	Chicago, Ill.
Viles, A. L.	The Rubber Association of America	New York, N. Y.
Webber, Henry S.	Heyden Chemical Works.	St. Louis, Mo.
Wedgwood, Jos. V.	Portage Rubber Co.	Akron, Ohio.
White, W. W.	C. J. Tagliabue Manufacturing Co.	Brooklyn, N. Y.
Whittaker, Wm.	Chas. E. Wood	New York, N. Y.
Wilber, Marshall D.	Palmer Tire & Rubber Co.	St. Joseph, Mich.
Wilson, Chas. T.	Chas. T. Wilson Co., Inc.	New York, N. Y.
Wilson, E. W.	Wilson Tire & Rubber Co.	Springfield, Ill.
Wilson, W. E.	Akron Rubber Mold & Machine Co.	Akron, Ohio.
Wishnick, Robert	A. Daigger & Co.	Chicago, Ill.
Wright, Clarence.	Racine Auto Tire Co.	Racine, Wis.
Wrisberg, W. E.	Newsom Valve Co.	St. Louis, Mo.
Wuchter, W. W.	Nebraska Tire & Rubber Co.	Omaha, Neb.

CANADIAN NOTES.

The Mount Royal Rubber Co. opened its new factory building on Messier street, Montreal, Quebec, with an informal housewarming on the evening of December 5, 1919. About eight hundred guests attended, including officials, executives, and employes of the offices, factories and field organizations of Ames Holden McCready, Limited, The Ames Holden Tire Co., Limited, and Ames Holden Felt Co., Limited, as well as of the Mount Royal Company. Dancing followed an informal reception and refreshments were served at midnight on the third floor of the building.

The Goodyear Tire and Rubber Co. of Canada, Limited, according to report, will build a $75,000 plant in Regina, Saskatchewan, to serve as western headquarters in Canada.

The Brunswick-Balke Collender Co., Hanna avenue, Toronto, Ontario, is reported to have bought a factory site at Woodstock, the same province, where it will construct a new plant to cost $200,000.

The Imperial Tire Co. is the new name of what was formerly the Imperial Vulcanizing Co., 569 Yonge street, Toronto, Ontario, the change being in name only. This concern is Toronto distributer for the Gates half-sole tire.

Extensive plant increases are being made at the Sherbrooke, Quebec, factory of the Canadian-Connecticut Cotton Mills, Limited, manufacturers of Sea Island, Egyptian, peeler and Arizona cotton fabrics. New funds to the extent of $5,000,000 have been arranged for and it is understood that some very important and strong connections are identified with the enterprise. With the increased facilities to be in operation in 1920 the plant will have a capacity of 13,000,000 pounds or more of tire fabric. This is considered to be in excess of the consumption of the country, but it is the desire of the company to make ample provision for the future growth of the Dominion. Meanwhile the surplus product will be exported, active preparations for this latter branch of the business already being under way. Provision has also been made for another large extension in 1921.

The offices of the company are at 15 Park Row, New York City, and the officers are: Harry L. Burrage, president; Tracy S. Lewis, treasurer; R. J. Caldwell, chairman; and Obadiah Butler, secretary-treasurer.

CHICLE CONCESSIONS IN CENTRAL AMERICA HAVE LONG BEEN EXploited by chewing gum manufacturers. Now comes the acquiring of balata concessions in Venezuela by the English firm of R. & J. Dick, pioneers in gutta percha and balata manufactures. The next step to assure guttas for belting, golf balls, cables and chewing gum will doubtless be the growing of trees or shrubs capable of producing gum plastic somewhere in the Americas.

The Rubber Trade in Great Britain.

By Our Regular Correspondent.

SPREADING ROOM VENTILATION.

BENZOL POISONING, which was referred to recently in this correspondence, has now become of general interest to the proofing trade, not that benzol is likely to be commonly used, but because the Home Office Factory Department is considering whether the stringent rules as to ventilation are to be applicable and compulsory in all cases where solvent naphtha is used. If this comes to pass—and it seems quite likely—it means a good deal of trouble and expense in a matter which many proofers consider does not call for any alteration in procedure. What may be necessary where poisonous dope is used and where fatalities have occurred, is not wanted, they say, in ordinary rubber proofing, the workmen engaged in which can be shown by statistics to be healthy and long lived. Of course, the ventilation in a good many old and cramped spreading rooms might be improved with advantage, but a protest is being raised against the proposed compulsory adoption of the somewhat severe dope regulations.

The scheme is that air previously warmed is to enter the roof or ceiling of the spreading room and be drawn out by a fan near the floor, an arrangement which is intended to insure that the operatives are always breathing air free from naphtha-vapors. Some firms have already been put to considerable expense in arranging matters to meet the factory inspector's present requirements, and others who are enlarging or moving to new premises are in trepidation as to the alterations they may be compelled to make in the near future if greater stringency is decided upon by the powers that be.

It seems to me that the time is not ripe for any general condemnation of solvent naphtha, though there is certainly room for experimental work as to the effects of thorough ventilation upon the health of the workmen—experimental work such as has been carried out in the cases of benzol and dope. Solvent naphtha is not a war-time novelty sprung upon the trade, and the experience of those who have worked with it for half a century should not be lightly put aside by those in authority who have only recently made its acquaintance. It seems likely that one result of the new move will be an increased tendency to consider the representation of the naphtha recovery engineers who, generally speaking, have been preaching in the wilderness.

With regard to the possible future use of benzol in rubber works the matter of price will be an important factor. At present this is controlled by the Benzol Manufacturers Association which is selling a heavy benzol for motor use at about 2 shillings per gallon. This price, however, is now about to come up for consideration at the hands of the Central Profiteering Committee in London and it is possible that some reduction may be brought about.

THE GREENGATE AND IRWELL RUBBER CO., LIMITED.

This company has been formed with a nominal capital of £800.000 to acquire the two private limited companies of I. Frankenburg & Sons and the Irwell and Eastern Rubber Co., both of Salford, Manchester. Frankenburg's is the older company, its chief concern being with the proofing branch, though the manufacture of insulated wire and canvas shoes were added at later dates. The Irwell company, in which I. Frankenburg was also largely interested financially, was concerned solely with mechanical goods and the manufacture of balata belting. James Tinto has been the leading spirit in this company since its inception and now becomes chairman of the new company, the main reasons for the formation of which are the closing of various trusts held by the late Mr. Frankenburg and the desire to raise additional capital. The land, buildings, plant, etc., are valued at £240,000, independent of the stock in trade, book debts, investments, cash in bank, etc.

The new capital issue to the public is 250,000 7½ per cent preference shares of £1 each, and despite the flood of new issues at the time the prospectus was issued, the response seems to have been most satisfactory. Commentators in the financial columns of the press expressed the view that these shares were a good investment for all classes, being well secured both as to principal and interest. Among the directors of the new company are Sydney Frankenburg, who has been in active service for the duration of the war, and J. Gibson Tinto, son of the chairman.

FUSION OF RUBBER MANUFACTURERS AND GROWERS.

The Federated Rubber Growers & Manufacturers, Limited, is the title of a new company formed by the combination of Wood-Milne, Limited, of Leyland, George Spencer Moulton & Co., Limited, Bradford on Avon, and the Pundul Estates, Limited. The capital is £1,250,000 in ordinary shares of £1. The directors are Alexander Spencer, London, chairman; Frank Turner, Rochdale, vice-chairman; F. Spencer, Ashton Abbotts, Buckinghamshire, and H. B. Potts, Rochdale. The rubber estate showed a net profit of £4,000 for last year. A recent quotation for the shares of the new company was 27*s.* 6*d.*

STANDARD TYRE AND RUBBER MANUFACTURERS, LIMITED.

This company has been formed with a share capital of £200,000 to take over from the Chemical Engineering Corporation, Limited, as a going concern, the Alperton Rubber Mills near Wembley, Middlesex. The purchase consideration is £125,000, and in order to provide sufficient capital £60,000 debentures have been issued. The offer to the public was £100,000 ordinary shares of £1 each.

The works management is to be in the capable hands of Mr. Hughes, formerly with the Dunlop company and more recently with the Victor Tyre Company and the Almagam Works, of Harpenden. Mr. Warwick, of the latter company, who was also connected with the Wembley Works when they were controlled by the Chemical Engineering Corporation, Limited, has now no interest in the new company.

FIRES.

In November a fire occurred at the works of G. W. Laughton & Co., Limited, rubber manufacturers, of Craft street, Clayton, Manchester. Another fire of a more serious nature was at the Bank Bridge Works, Limited, near Manchester, the new plant which was due to start work in a week's time and which had cost £10,000 being very considerably affected.

TRADE NOTES.

The motor shows and the motorcycle and cycle shows in London in November seem to have been successful from all points of view, except for the difficulty experienced by visitors in securing hotel accommodation. It will be some time before this state of affairs rights itself, as we all hope it will some day, and for this reason, if for no other, it will come as a relief to many that H. G. Montgomery, upon whom the mantle of the late Staines Manders has fallen, has decided to postpone the next International Rubber Exhibition in London from 1920 to 1921.

The descent of London financiers upon Lancaster for the purpost of buying up cotton mills has naturally caused a great stir, and from the prices that have been paid to the fortunate hold-

ers of shares, it is clear that the cotton requirements of the rubber industry will not be filled at easier prices than now rule for some time to come.

At the time of writing—the end of November—a deadlock exists in the Industrial Council for the rubber trade regarding the demands by the operatives of a further increase in wages. The India Rubber Manufacturers Association has turned a deaf ear to the request, mainly because it does not represent the whole of the trade and is not inclined to agree to terms which would not be binding upon others. The assistance of the Ministry of Labor has been invoked and a conference is to be arranged. The workmen's union, it is said, is desirous that the matter should go to arbitration, but this does not appear to meet with the employers' views.

EUROPEAN NOTES.

The Rubber Exhibition that was to have been held in London next summer has been put off till 1921. An exhibition of rubber goods from French manufacturers that was planned for the end of November in the rooms of the French Chamber of Commerce in Queen Victoria street was also given up.

British capital set out 75 per cent of the rubber plantations, of which more than 50 per cent are on territory belonging to Great Britain. Of the estimated 300,000 tons of rubber that plantations will produce, 220,000 will be England's. Some figure on a rubber production of 500,000 tons in 1926.

Fear is expressed in some British circles that Americans will buy up their rubber shares on the Stock Exchange, as they have a 16 per cent advantage over English capital, owing to the fall in exchange.

The Research Association of British Rubber & Tyre Manufacturers may be addressed in care of W. B. Peat & Co., 11 Ironmonger Lane, London, England.

Exports of rubber from London to the United States in the first ten months of 1919 amounted to $20,822,018 worth; in the same period of 1918 the value of rubber exported was $3,743,639. In the month of October alone the value of rubber shipped was $6,958,479, compared with $4,119,028 in September.

Rubberized fabrics according to British reports are in demand greatly exceeding the supply. It is greatest from France, which is a center for continental trade in the goods, but Holland, Scandinavia and South America, which calls for ponchos, are trying to buy extensively in the British market, and China and Japan are coming in also, especially for light weight cloths and garments. The Australian demand has fallen off, but Canada can do with any amount of British stuff in spite of the competition from the United States.

The London Central Committee under the Profiteering Act has now been formed. Among the large number of names, representative of a variety of manufacturers is that of Alexander Johnstone, of the North British Rubber Co., Limited, representing rubber. He was nominated by the Federation of British Industries, both he and James Sands, of the Irwell & Eastern Rubber Co., Limited, being on the directorate of that Federation.

Hale & Son, brokers in crude rubber, balata, gutta percha and asbestos, 10 Fenchurch avenue, London, England, announce that William Bertie Jenner Horne has been taken into the partnership. Mr. Horne has been associated with this firm for the past fourteen years. The other partners are M. G. Hale, B. S. Ingram, J. M. Vanhouse and M. W. Palmer.

Finland's first factory for making balata belting, the *Finska Remfabrikan So.* (*Suomen Hilmatchdas, O. Y.*), founded in 1916, has been able to begin work only recently, as the balata, rubber and gutta percha it had bought in England was held up in Sweden during the war and has only just now been released.

The great Vickers plant at Barron in Furness has been converted to a peace basis and the projectile shop is now turning out machinery, including rubber mixers and calenders.

The plan of standardizing golf-balls is discouraged for the present by "The India-Rubber Journal" on account of the difficulty in changing molds.

Poland requires no import license for raw celluloid, rubber, caoutchouc, and technical manufactured rubber goods.

The union of German surgical hard and soft rubber manufacturers, at a meeting held in Leipzig to regulate prices, on account of the general rise, decided for an increase after November 14, 1919, of 10 per cent on seamless and patented rubber goods and of 25 per cent on hard rubber goods.

The German rubber industry shows a generally satisfactory activity and the manufacture of tires has started up again. Orders, however, can be filled only in part, owing to the deficiency in crude rubber and in coal.

German firms are taking large orders in Denmark for surgical and hygienic rubber goods, hard rubber combs, etc. Owing to the low value of the mark they can compete against English and American manufacturers, but whether they can deliver their goods seems doubtful.

At Fröndenberg on the Ruhr, a factory has been established for the manufacture of automobile tires and rubber goods for export to Russia by the proprietors of the late Prowodnik works at Riga, in connection with the cable works at Fröndenberg The company is called the *"Rhenish-Westfälische Gummi und Gutta Percha Werke, Atlantik,"* and plans to turn out 2,000 pneumatic tires a day. The Prowodnik works at Riga may be started again with machinery provided by British and French agency.

Italy's consumption of raw rubber increased four-fold in the eight years ended in 1918, when it imported 7,545 metric tons of crude rubber. Turin and Milan are the important centers for the rubber and allied industries, though there are factories also at Genoa, Leghorn and Naples. These employ about 20,000 workmen and produce every kind of rubber article; automobile, motorcycle and bicycle tires are the most important and the output of insulated wire and cables is very large. The Italian company that manufactures insulated wires is about to increase its capital. A recent Royal decree regarding telephone equipment gives the preference first to Italian goods, produced by Italian capital and labor and using native material, and next to foreign firms, established in Italy and producing their goods in that country. Where bids are called for native firms will have a protection of 10 per cent and foreign firms producing in Italy a protection of 5 per cent.

GERMAN RUBBER REGISTRATIONS END—TRADE FACES ECONOMIC DIFFICULTIES.

Special Correspondence.

By a notice dated September 20, and taking effect September 21, the German Imperial Minister for Industry has officially put an end to the confiscation of and obligation to register crude rubber, gutta percha, balata, reclaimed rubber, asbestos, partly or wholly finished manufactures, and also the prohibitions against producing them.

The German compulsory management of rubber is therefore ended. The Association for the Sale of War Tires will be dissolved at the end of the year. The prohibition of importation of automobile tires still stands on paper; nevertheless, adequate quantities are to be admitted free in so far as German industry cannot meet the demand. Really it ought to be able to meet it since even before the prohibition on production was lifted, both

secretly and more or less openly, large purchases of rubber were made. For that matter the crude rubber situation is merely a question of importation. Much more difficult is the procuring of the necessary textiles and, most serious of all, are the prospects of a coal shortage this winter. The outlook in this respect must be described as very unfavorable. The Continental Rubber & Gutta Percha Co. has been obliged to shut down for a week on account of lack of fuel.

As stated above, the prohibition of automobile tires imports remains in force for the present without its having been able to interfere thus far with the flooding of the German market with foreign tires on the expulsion of rubber manufactures from the field they had occupied.

All in all the conditions which await the German rubber industry are not precisely rosy. Of crude rubber it will be able to obtain more than enough but at what cost in comparison with values, besides the everlasting strikes, the demands for high wages, the unwillingness to work and the prospect of nearing communistic troubles.

The Hamburg crude rubber market begins to come to life even if the transactions are still very small. Holland can sell much rubber to Germany—if the dealers there will put up with unfavorable terms of payment and credits. Germany has become a poor country and must pay dearly for many sins she has committed. The great mass of the people, however, did not wish for the war and regarded it throughout as a war of defence.

PRESIDENT OF KOBE-OSAKA RUBBER MERCHANTS' ASSOCIATION.

Y. MIYAGAWA, president of the Kobe-Osaka Crude Rubber Merchants' Association, was born on October 23, 1888, in the city of Hiroshima, Japan. His father being a Samurai of high standing, Mr. Miyagawa was brought up in a very strict home. Later, however, he was converted to the Christian religion and baptized in December, 1904. Having graduated from the Hiroshima Commercial College with honors in March, 1905, he entered the Royal Rubber Works, Kobe, where he learned about rubber goods in general as well as methods of manufacture under Dr. R. Yoshida, one of the greatest rubber authorities in Japan.

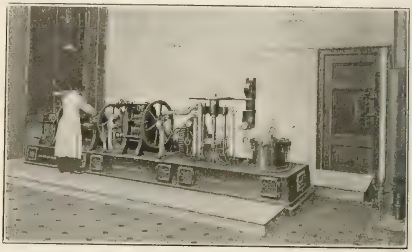
Y. MIYAGAWA.

In 1910 Mr. Miyagawa was appointed sales manager of the Standard rubber factory, and in September, 1912, was made manager of the Nagoya branch of the Dunlop Rubber Co. (Far East), Limited. In November, 1913, he decided to go into business for himself and established the firm of Y. Miyagawa & Co., Osaka, importers of crude rubber and exporters of rubber goods. The business prospered, and entrusting this Osaka office to his younger brothers, he started a branch at Kobe, which has since been separated from the Osaka office and is an independent firm at present.

Mr. Miyagawa has visited the Straits Settlements and India, studying rubber market conditions in general. These journeys taught him the need of improving the general conditions under which transactions in crude rubber were being made in Japan, and when the Kobe-Osaka Crude Rubber Merchants' Association was established under his auspices he was appointed president. He is also a director of the Osaka Rubber Goods Merchants' Association, and is the adviser to the Indian Market Department of the Dunlop Rubber Co. (Far East), Limited. His wide experience and responsible connections entitle Mr. Miyagawa to be regarded as one of the highest authorities in the Japanese rubber trade.

THE DUTCH ARE UP TO DATE.

Very few are aware of the fact that the Government of Holland exercises an exceedingly careful supervision over the rubber and gutta percha industry in the Netherland East Indies, not in a cursory way, but in the way of scientific testing of all types of gums, and reports that are of the greatest value to the planters.



RUBBER LABORATORY MACHINERY, TECHNICAL COLLEGE, DELFT, HOLLAND.

The accompanying illustration relates to the experimental rubber plant erected at the technical college at Delft, Holland. It deals with only one portion of the large department devoted to the rubber mill section. Here are seen a miniature washer, mixing mill, calender, press and vulcanizer, all of the approved type and capable of handling samples of considerable size. The plant is run electrically, and there is also a self-contained steam generating plant. Connected with this department is an up-to-date laboratory equipped with everything necessary for analysis and testing.

A FREE PORT AT STOCKHOLM.

Sweden, having decided to establish a system of free ports, has made a beginning with one in the harbor of Stockholm, which is now open for business, though far from completion. It may take ten years before the plans prepared are fully carried out. As it is, two steamers can now be sent out at once. By next year piers will have been built which will allow steamers drawing 27 feet to discharge. Stockholm is getting ready to handle most of the goods that are to go to other Baltic ports.

THE NIGERIAN METHOD OF STRIKEBREAKING.

Two months' imprisonment with hard labor is the penalty for West Coast of Africa negroes who refuse to work on Sunday, according to a judgment given recently at Calabar in southern Nigeria. A large Pará rubber plantation started tapping and informed the "boys" who had been trained for the work, that they must work on Sundays, and would receive more pay than the other laborers who did not work on that day. After trying it for one Sunday, a few of them organized a strike, after European methods, induced most of the others not to work, threatened those who were willing, and informed the manager that the men would not tap at all unless he stopped Sunday work. The ringleaders were arrested. The magistrate at once found them guilty and told them he could send them up for two years but, as it was a first offence, gave them only two months.

Pará Rubber in Mexico—Some Reminiscences.

By J. L. Hermessen, F.R.G.S.

THE SPECIAL CONTRIBUTION in the October number of THE INDIA RUBBER WORLD, under the heading "Rubber in the State of Vera Cruz, Mexico," has suggested to me the possible interest of some notes regarding Pará rubber in Mexico, by reason, particularly, of the mention of the plantation El Palmar, owned by El Palmar Rubber Estates, Limited, of Glasgow, Scotland. This property possesses the distinction of being (or, since its very existence now is questionable, one should perhaps better say, having been) the pioneer in the experimental cultivation of *Hevea brasiliensis* in Mexico. While many others, in the several and often far separated planting districts of the country (in parts of the States of Vera Cruz and Oaxaca, of the Isthmus of Tehuantepec, and of Tabasco and Chiapas on the borders of Guatemala), had made tentative trials with the tree, in no case within the writer's knowledge had plantings of any area been attempted.

Dr. Pehr Olsson-Seffer was quite well known to me before he was connected with El Palmar, but what is about to be related belongs to the period of the late J. C. Harvey's incumbency as manager there; for by him the enterprise was initiated and under his personal direction carried out.

Mr. Harvey had long previously taken a more than plantonic interest in *Hevea brasiliensis,* and in his garden at Buenaventura, where he had formed a splendid collection of tropical flora, both ornamental and economic, he raised a number of specimens from seed procured from Ceylon—in the first instance, I think, direct from the Government Botanical Station at Peradeniya. These, throughout the years of their growth from slender plants into mature trees of tappable age and size, had

HEVEA BRASILIENSIS AT EL PALMAR.

been the object of devoted care and study on his part, eventuating in a series of systematic tapping experiments, the results of which went to strengthen Mr. Harvey's belief in the suitability of certain sections of the country to the introduction of the Amazon rubber tree, adaptable, as it had seemed in the East, to physiographic conditions differing widely from those of its native habitat. From Buenaventura, under date of April 13, 1913, Mr. Harvey wrote:

I have been spending some three weeks here, sizing up our situation and I think we will go ahead and reconstruct this prop-

HEVEA BRASILIENSIS NURSERY AT EL PALMAR IN 1911.

erty in cacao, coffee and Pará rubber. . . . . . Pará is a success on wound response. I have been tapping two or three trees daily for a week, and the yield increases from the single paper-like shaving taken off the lower edge of the first and only incision. Academically, I knew all about this but, tool in hand, doing and seeing results is moving, I assure you. A little arithmetic comes in. Say that we cut out two dry months, April and May, we have ten months; deducting Sundays and possibly five feast days—285 tapping days—say 4 grams dry rubber per tree, or 1.140 kilograms per tree for the year. Cut it in two for young trees, and it makes *Castilloa* look pretty sick. No guesswork, but facts that are demonstrable. The authorities in the Orient say that an expert tapper handles 800 to 1,000 trees per day. If he taps only 500 per day it nets 2 kilos dry rubber per man per day at 4 grams per tree, so that our wage rate still leaves a handsome profit at $1 per pound, United States currency.

A little later (I have no memorandum of the date, but it was almost certainly in the month of May, because it was, as I recall the height of the dry season on the Isthmus of Tehuantepec) I was staying with Mr. Harvey at Buenaventura, and together, for a week, we sallied forth every morning before sunrise, with our tapping paraphernalia, to the ground allotted to *Hevea.* I have to regret the loss, through the vicissitudes of war years, of information upon the results of our operations of which we kept at the time the fullest record. Suffice it to say that they amply confirmed the figures in Mr. Harvey's letter quoted above.

The first planting of *Hevea brasiliensis* at El Palmar, on regular field lines, was done with stumps to the number of several thousand, imported for the purpose from Ceylon. Upon arrival these were put into nurseries, and after they had become acclimatized and generally fairly established they were set out to make their way further under conditions to which they would have to accustom themselves to prove a commercially successful culture. The proportion of plants which survived the preliminary nursery stage was not as good as Mr. Harvey had expected, and he subsequently elected to get *Hevea* seed from Ceylon. This was sown in specially prepared nursery beds, and from the time of germination to that of removal of the plants

to the field they were most carefully tended and guarded against every potential element of danger. Again, unfortunately, details like planting distance, number of trees per acre, etc., are not now available.

In a letter dated Buenaventura, September 26, 1914, which reached me, after a course of some months, at Loja in Ecuador, Mr. Harvey said:

Shufeldt, Clarence and I spent some days last week at El Palmar. Our 50,000 Pará trees are good to look at. Clarence's few trees at San Silverio have cleaned up for the year an average of ¼ pound dry rubber per month per tree, which is more than satisfactory. The largest tree at El Palmar, four years from seed, measures 24½ inches in circumference 1 foot above ground. I am going to try the tool on it this December or January. I expect to be in full swing on a few thousand trees two years from December, as measurements made the other day justify this anticipation. The tree you and I measured at Buenaventura years since—then, I think, it was 13¼, or 15½ inches—now measures 32 inches in circumference 2 feet above ground.

About a year before (to be precise, in the month of August, 1913), when acting as *locum tenens* on the American-owned estate of San Silverio, Oaxaca, in the absence of the resident superintendent, C. M. Harvey, it fell to me to supervise the setting out of some thousands of Pará seedlings from the nursery. There, too, earlier trial growths of *Hevea* had shown the same encouraging development as at El Palmar and, in consequence, upon the recommendation of J. C. Harvey, who was the consulting expert, a quantity of seed had been obtained from Ceylon and some regular plantings started, comprising, if I recollect rightly, five or ten thousand trees at the time referred to. The *Hevea* seedlings were interplanted with young *Castilloa*, a practice which Mr. Harvey had originally adopted on his own private property of Las Palmas, near Buenaventura, with beneficial effect, he thought, the indigenous tree affording the supposedly more delicate exotic some protection against the unfavorable phenomena of the dry season, characterized as it is on the Isthmus of Tehuantepec by a relentless sun and spells of a riotous hot south wind lasting for days at a time. It is in my memory that these plantings suffered severely from the dietary attentions of deer, who evinced a fine taste for young Pará, and I think that we were ultimately forced to employ some sort of fencing arrangement about the trees.

It is greatly to be deplored that events in Mexico since 1913 should have rendered impossible the task of bringing to fruition these very interesting and valuable planting ventures which, when last seen by the writer, bore every promise of success. It is to be feared that nothing can now remain of them, the region in question (within only a short distance of the important coffee center of Córdoba) having been constantly overrun and plundered by rebel bands.

RUBBER PLANTING NOTES.

LOOKING AHEAD IN RUBBER GROWING.

A BRITISH ESTIMATE OF THE FUTURE of rubber production and of rubber consumption by a man in a position to know the facts intimately is sure to attract attention. At a meeting of Harrisons & Crosfield in London on October 27 Mr. George Croll, the chairman, reviewed the rubber situation and compared it with his own forecast made in 1918, before the Rubber Plantations Investment Trust. He then asserted his belief to be that if there had been no war, the consumption of rubber would have been much greater than it was and that he saw no reason why the probable large increase in 1919 could not be absorbed. He thinks there is room for great improvement in rubber statistics, but from a careful examination of the best available his conclusions are as follows:

After making allowance for the accumulation of the 1918 crop, which was exported from the Eastern countries during the first half of 1919, I now estimate the production of plantation rubber for this year at about 320,000 tons, to which 40,000 tons of wild rubber have to be added, making the worlds production of rubber this year 360,000 tons.

His estimate for the 1920 crop is between 360,000 and 370,000 tons; for the 1921 crop, 381,000 tons; for 1922, 403,000 tons, and for 1923, 430,000 tons.

In regard to consumption he expects the United States to import in 1919 about 220,000 tons; the United Kingdom to make a poor showing with 40,000 tons; France 30,000 tons, Italy 15,000 tons, Canada 10,000 tons, Japan 10,000 tons and the rest of the world 25,000 tons, a total consumption of 350,000 tons out of the 360,000 tons produced. The consumption in 1919 will take care of the production and Mr. Croll thinks that that will be true of 1920 and 1921 also.

British capital owns approximately 80 per cent of the plantation rubber industry, which is far from being the case with the consuming end. From July, 1914, to June, 1915, the United States took 141,000 tons of rubber and the United Kingdom 21,000; in the twelve months from July, 1918, through June, 1919, the United States took 180,000 tons and the United Kingdom only 50,500 tons, and as Great Britain has a large transit trade, a great part of this even was reexported as crude rubber.

AVERAGE YIELD OF HEVEA RUBBER.

The amount of *Hevea* rubber yielded per acre on the average in the various rubber plantation districts of India, Ceylon and the British and Dutch East Indies appears in the Bulletin of the Rubber Growers' Association of South India.

	Average Pounds per Acre.		
	1917.	1916.	1915.
Ceylon	312	253	248
South India	218	232	187
Johore	298	283	328
Negri Sembilan	298	283	228
Perak	382	367	353
Selangor	344	340	331
Straits Settlements	247	252	243
Sumatra	326	309	305
Java	322	303	253
Borneo	226	224	170

The highest record in the list was 607 pounds in a Selangor estate in 1917, the lowest 81 pounds in the Straits Settlements in 1916.

CEYLON RUBBER PRODUCTION.

Ceylon in 1918 exported 50,934,460 pounds of rubber, valued at $22,226,268, as compared with 75,781,401 pounds, valued at $44,543,785 in 1917; a decrease of one-third in quantity and one-half in value. The exports in 1918 were smaller than in any other year since 1914. This was due partly to the restrictions on the importation of rubber into the United States and to the removal of rubber from the priority list in the United Kingdom and partly to the restriction of the output by the planters. No average price for the year was computed by the Ceylon Chamber of Commerce. The price in 1916 was 58 cents a pound in 1917 it was 48 cents, in August, 1918, it was 20 cents a pound for crêpe and 18½ cents a pound for ribbed smoked sheets, while toward the end of the year both were selling for about 38½ cents a pound.

RUBBER CULTURE RESEARCH WORK IN BRITISH INDIA.

Professor J. B. Farmer in "The India-Rubber Journal" discusses the report of Dr. Butler, imperial mycologist of the Department of Agriculture in India, regarding the administration of research work in the British possessions in the Far East. The proposal to unite all agencies for research—government, corporation and private—is thoroughly approved, for in all matters of rubber culture the attempt to retain exclusive information seems short sighted.

Concerning Dr. Butler's projects for a central management for research Professor Farmer is apparently skeptical. The division of responsibility between the government administration, the rubber planters and the scientific experts will be a difficult matter to settle in the East. Professor Farmer suggests that a small scientific committee in London be put in charge.

The Balata Industry in the Colony of Surinam.

By J. Barkley Percival.

Prior to 1857 balata was practically unknown, at least to civilized man. The natives of the Guianas are said to have used it for cutlas handles and drinking vessels, but only rarely. In the year mentioned, Professor Bleeknode described it as Surinam gutta percha, which it really is, and not a rubber as so many mistakenly call it.

Exports from Dutch Guiana began in 1881 and were very small—365 pounds. However, by 1911 the product reached some 3,000,000 pounds, increasing almost every year with the single exception of the year 1888, when none was gathered. All told, up to the present time, there has been given to the world fully 30,000,000 pounds of Surinam gutta percha.

The tree from which this valuable gum is obtained is the *Mimusops globosa,* described under eight other names, the commonest of which is Gaertner's *Mimusops balata.* Other names are *Sapota mulleri, Mimusops kauki,* which is Linnaeus' name for the tree, *Mimusops dissecta, Mimusops hookeri, Mimusops ballata,* which is Blume's spelling of Gaertner's title, *Achras balata,* and *Lucuma mamosa.* The Surinam Dutch call it the horse-flesh tree, on account of the appearance of its wood, while the English have corrupted the native "bolletrie" into bullet-tree.

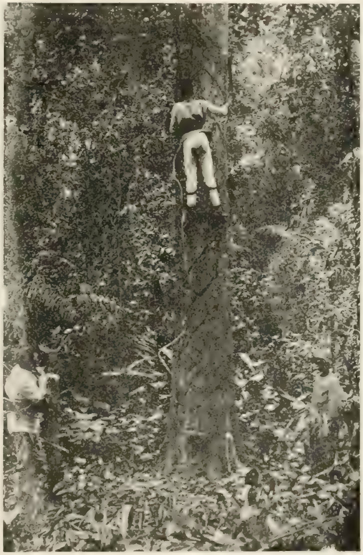
The tree grows to a large size, often attaining a diameter of six feet, has thick, rough bark and reddish wood, as its Dutch name implies. The leaves are glossy, oval and pointed at the tip. The flowers appear in groups surrounded by leaves. The fruit is a berry about the size of a coffee berry, but soft and sweet. The kernel is hard and produces a bitter oil.

Soon after the Dutch Colony began to ship balata, British Guiana and Venezuela entered this field, the three countries named furnishing the bulk of the gum that is marketed.

The tropics furnish scores of different trees yielding a milk which coagulates into a gummy mass, and while the famous "bullet" tree was the foundation of the commercial balata business, and still retains its place as the producer of the best balata, it has never been the sole source of supply. There has been a good deal of "mixing" done in the past, but the laws are so stringent and the collectors so sharp that dishonesty among the bleeders is now almost impossible. Dutch Guiana is remarkably rich in gum-bearing trees so that the temptation is very great to palm off the bastard for the legitimate gum on the market.

Discovery of the varying properties of gum from the different trees has been a gradual matter following the development of commercial balata extraction in Surinam; methods of coagulation are probably as old as the aboriginal use of the gum. That in the Colony has certainly not varied for fifty years, with the exception of isolated experiments toward improvement.

The milk, caught in mud, leaf or calabash below gashes made with a sharp instrument in the bark, is collected in kerosene tins and then it is taken to the camp where it is poured into shallow trays (debrees) which hold from five to thirty gallons. The milk congeals in these trays and the balata is taken off in sheets, successive sheets being removed until the trays are empty with the exception of the mother liquid. These sheets are hung up first over the debrees to drain and then in a roughly constructed shed. When dry they are dispatched to Paramaribo for export to the ultimate market.



A Balata Bleeder at Work.

There are always tricksters in trade and the balata man is no exception to the rule. Frequently some extremely foreign bodies are found concealed, some perhaps by accident, but the most, however, through intent, in order to make the sheet weigh more. In this way stones, lumps of hard wood and nails have found a temporary resting place between the layers of gum. The laborers are paid according to the amount of balata collected and this, perhaps, is the cause for the temptation of "packing" foreign matter between the sheets.

The yield per tree varies considerably, the flow being affected by changes in meteorological conditions. Trees give at the first tapping an average of one gallon of milk each, equivalent to about five pounds of dry balata. The cuts made in the bleeding of balata are stated to take four or five years before they are entirely healed, and as no tree may be retapped before the incisions are completely healed, that period has to elapse before retapping can be done. Subsequent tappings are said not to yield as well as the first ones. Accurate records, however, are lacking.

For the purpose of the administration of balata-collecting concessions, the colony is divided into blocks—a more easily accessible northern portion and a less accessible hinterland. These blocks are then granted to companies who pay the taxes yearly in advance to the government and in default to pay the taxes on a certain date, all rights to the lands are forfeited immediately. Applicants must give the Crown Lands officer a satisfactory security that there is sufficient means to operate the concessions thoroughly before they are granted.

No balata tree is allowed to be bled which does not measure 36 inches in girth at four feet from the ground. Trees may be bled on only one-half of their girth at any one time, and no tree can be retapped until the previous incisions are completely healed. For bad work or contravention of the conditions under which the concession is issued the concessionaire is held responsible, but he is empowered to, and expected to prosecute any offending bleeders or employes. The government has appointed forest officers to assist the Crown Land officers in inspecting the

work of the collectors and with many beneficial results.

The gathering of balata is done by black or colored laborers and these have to be registered before they can be employed. They usually obtain advances of money at the time of registration for the purpose of purchasing their bush outfit, implements, etc. On the site a suitable tract is selected for a camp, and rough leaf-covered huts are put up. The debree—a shallow tray in which the balata milk coagulates—is then built and everything is in preparation for the collection of the latex. The balata bleeder now proceeds to locate the exact position of the trees nearest at hand, and makes his plans for collecting. The trees are tested with a small cut in order to ascertain in what condition they are for operating upon, and from these initial cuts an experienced bleeder can readily ascertain which trees will most quickly repay tapping.

During the present year the price of balata made marked variations. At the beginning of the year it was up to four florins[1] the kilogram,[2] but in August it was down to nearly half that figure in the local market. Meanwhile the rival balata from private lands is also bringing about two florins the kilogram in the city market, and a crop of nearly 50,000 kilos is predicted.

In spite of this competition, which has for the last four years dictated prices in the local markets, the balata from concessions maintains its favored position on account of its purity and excellence.

The most spectacular feature in the prices of balata is that for the years 1909-12, during which the article brought unheard of prices. These were the days when the balata merchant—not the collector—found his hands full of money. He could sell balata and make a profit at an average price of one florin[1] and fifty cents the kilo, while the world's market offered about seven guilders[3] and fifty cents for each kilogram. This golden shower, following upon other periods of high prices in the early 'nineties and remoter times acted on the balata merchant in a manner that convinced him firmly that good times were the normal thing; that if periods of bad luck came they would pass in the future as they had passed in other years, and that, in fact, "something always comes along to help the Surinamer" in spite of crude methods of collection, unsystematized economic methods, enormous export duties and all the other difficulties against which Dutch Guiana balata has to struggle. Although the colony of Dutch Guiana has produced large quantities of balata since the inception of the industry, there are yet unheard of quantities awaiting exploitation with the advent of capital, which will certainly come along sometime in the near future.

It may be interesting to describe the life of the average balata bleeder. He gets up in the morning—that is rolls out of his hammock—at four o'clock, and lantern in hand, for it is dark until six, sets out with his cutlas (machete) for gashing the trees, or for clearing the paths on his round of tapping. He gashes each tree hastily, fixing a calabash below each wound, visiting each one of his hundred trees and returning by the outer path to his hut, where his woman, if he has one, has prepared his coffee. More generally he is alone, and in that case he proceeds to light his fire and drip his own coffee.

[1]One florin equals $0.402 United States currency.
[2]One kilogram equals 2.2 pounds.
[3]One guilder equals $0.40 United States currency.

Later in the morning he must make a second round if the milk is not to coagulate in the calabashes. He takes his kerosene tin and tips the contents of each calabash into it, carefully inverting the calabash on a bit of stick at the tree's foot. When he returns he has perhaps three or four liters of milk, which must now be coagulated in the debrees.

A bleeder often walks from six to ten miles a day, for distances between each of his trees may be long ones; there are 80 non-balata trees to each balata in the average Guianese forest. He works from four in the morning until sundown, or more or less than 14 hours a day; small wonder if he keeps Saints' days now and again, or spends a merry week-end drinking rum.

TANK FOR COAGULATING BALATA.

It is said to be good work if the bleeder can make 50 liters in two weeks; he is more likely to take a month. When he completes one of the sheets, he takes it to the foreman, who is in much the same position as the "grubstaker" of early California gold mining days, and who is remarkably lucky if he comes out with any amount of money in hand at the end of a season. Sometimes he does, and is then likely to arrive in Paramaribo with more guilders than his accustomed pockets can conveniently hold, and proceeds to get rid of his pile in a week or two. There are exceptions, where the collector goes back with savings made in the city, and the proprietor naturally gets the best of the business of this season.

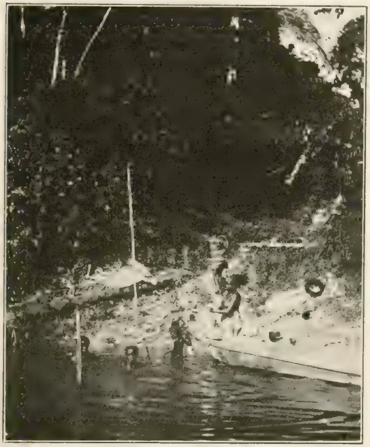
In too many cases the collector has neither rioted nor saved at the end of a season's work; he has been charged a comparatively tremendous sum for each scant item of food and equipment. It is more easy than reasonable to blame the concessionaire for this high price; he has had in his turn to pay high for imported goods from the United States and he is taking the risk of the balata collectors failing to make good, whether from incompetence or sickness. These are not healthy regions, and many men become incapacitated or die in the forests; their successors pay their debt to the company, albeit unconsciously.

It is calculated that there are at least 10,000 men engaged in the balata collecting business in Surinam; they work on an average only 160 days in the year, produce in that time about 800 pounds of balata which is drawn from 150 to 200 trees. Some experts in the business say that the bleeder could, if he chose, work eight months in the year instead of less than six which is more common, but one of the main attractions of the life is that the collector of balata is able to work when he pleases, lay off for a day or two, have a good time when he feels inclined and can go home to see his family when, if ever, he saves up enough money. His rewards are, however, so largely discounted by the inflated prices which he pays for the miserable supply of food on which he supports life that it is remarkable that this industry is as well fed with labor as it is. Nothing but the hope of easy money, which has come at times of high balata prices—a lure akin to that of the gold mine—takes men into the Surinam forests.

One suggested remedy for the exorbitant values placed upon food-stuffs is that the state should provide commissary stations

where supplies could be bought at reasonable prices; such a system, honestly carried out, would perhaps help to put economics on a better footing, but so far the idea remains an idea.

Many advanced countries hold fast to their faith in untaxed exports. It is a doctrine with much to recommend it, especially



On the Maroni River.

perhaps in the case of manufacturers, but it is one which the South American countries cannot yet afford to follow. The state revenues are thus maintained, and balata has been the favorite milch cow of the authorities. It has paid in the past, and still is paying one-third of its official value in various export duties. Almost without exception those interested in the industry think that export taxes must be reduced; that they must in fact be reduced to meet conditions of the present day, if the industry is to last.

It must not be supposed that a decline or even the extinction of the balata industry in Dutch Guiana would mean the ruin of the colony. The threat of declination has rather done good in forcing the attention of industrialists to other fields than that of the collection of the latex of the balata tree. During 1917 there occurred a stimulation for agricultural pursuits, and several thousands of acres were cultivated with rice and other cereals and food roots, while the cattle industry received more serious consideration. There are vast uplands of pasture country which will be valorized when the world becomes more fully aware of the rapid contraction of cattle feeding grounds in other regions.

There have been, however, some important changes made during this year. In April the Balata Company Suriname acquired for a respectable amount the rights held by Brown & Co. on certain blocks, and it is rumored that the Consolidated Balata & Rubber Estates operating in British Guiana will soon take over for a good round figure some of the principal concessions held by local concerns. With the arrival of fresh capital and new blood it is expected that the industry will be placed on a still more firm and lasting basis.

The exports from the colony during the year 1918 were 663 tons against 887 tons in 1917, 765 tons in 1916, and 210 tons in 1915. The small output of last year is mainly due to the scarcity of labor; the best bleeders migrated to French Guiana where inducements were better than in the colony and where the workers are not so much controlled. A very large crop is anticipated for the present year, however, owing to the fact that there has been a rush of men from Demerara since the armistice was signed. Local restrictions having been partly removed, it is fair to say that balata will resume its former position as an important industry the moment conditions return to normal.

For five long years the balata boys experienced very hard times; they worked under some most difficult circumstances; the great scarcity of American foodstuffs on the one hand, and the uncertainty of receiving their wages on the other (owing to the world's struggle, which cut off the colony practically from the outside) were causes of great dissatisfaction amongst them. Now the worst is past and there is daily evidence of renewed interest to enter into contracts and be once more cheerfully earning their daily bread.

TRINIDAD RUBBER CULTURE.

Rubber in the island of Trinidad is still in the experimental stage though the Report of the Department of Agriculture of Trinidad and Tobago for 1918 says that it continues to expand. The exports were 39,517 pounds, nearly double the 22,224 pounds of 1917. On one estate 16,000 *Hevea* trees were tapped; on some scrap was made from *Castilloa* but many *Castilloa* trees have been cut down because the yield was less than had been expected. The report regrets the experimentation.

Hevea is apparently the best rubber tree for the colony; it flourishes not only in the moist districts but in places that were thought too dry for cocoa. Trees at St. Clair yielded an average of 2½ to 2¾ pounds in the last seven years when the average rainfall was only 56½ inches. Interesting experiments in tapping are reported and no leaf disease or other disease or pest has appeared so far.

THE ROOT SYSTEM OF HEVEA.

At the *Horto Florestal* of the *Seringal Miry,* the experiment station in the State of Amazonas of the Rubber Tree Club of Manáos, an interesting investigation has been made of the root system of *Hevea brasiliensis,* as shown in the illustration.

The trees in the grove are seven years old and planted thirteen feet apart. The roots on one-quarter of the circumference have

("A Seringueira.")

One Quarter of the Root System of a Hevea Brasiliensis, Extending Twenty-six Feet from the Trunk.

been uncovered here for a distance of over twenty-six feet from the trunk. The picture demonstrates graphically to what extent the rubber trees call on the soil for nutriment and is evidence of the necessity of wide planting.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED NOVEMBER 4, 1919.

No. 1,320,393. Fountain pen. F. M. Houston, Minneapolis, Minn., and W. A. Houston, Sioux City, Iowa.
1,320,404. Solid rim for tires. J. and A. Mohn, Red Wing, Minn.
1,320,417. Heel with rubber section. G. C. Seymour, New York City.
1,320,513. Rubber brush for washing bottles. C. K. Volckening, Brooklyn, N. Y.
1,320,518. Tire, multi-chamber type. O. Zancan, New York City.
1,320,540. Swimming apparatus with pneumatic cushion. F. Fedzyna, New York City.
1,320,596. Blotter with sponge rubber body. Shizutaro Aoki, Shimokyo Ku, Kioto, assignor to Takeji Tokuhisa, Tokio—both in Japan.
1,320,617. Bead anchorage for cord tires. C. G. Hoover, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.
1,320,648. Pessary. H. M. Potter, Bloomville, N. Y.
1,320,675. Piston packing of rubber-impregnated fabric. G. Christenson, Jamaica, assignor to H. W. Johns-Manville Co., New York City—both in New York.
1,320,708. Tire liner. M. Pianko, Chicago, Ill.
1,320,737. Suspensory bandage. A. R. Chisholm, New York City.
1,320,900. Respirator. E. I. McKesson, Toledo, O.
1,320,935. Gas mask. N. Schwartz, New York City.

ISSUED NOVEMBER 11, 1919.

1,321,188. Self-filling fountain pen. H. Catucci, assignor to Mabie, Todd & Co.—both of New York City.
1,321,206. Wheeled toy with propellor operated by rubber band. G. B. Hansburg and E. M. Lyons—both of New York City.
1,321,220. Tire with inner tube composed of rubber, sponge rubber, and fabric. E. H. Layman, Pacific Beach, Calif.
1,321,265. Appliance for telephone receiver. J. M. Wagner, assignor by direct and mesne assignments to W. L. McKay—both of Chicago, Ill.
1,321,266. Stethoscope. A. H. Wilkinson, Jacksonville, Fla.
1,321,301. Pneumatic cushion. W. A. Gibbons, Flushing, N. Y., assignor to the Rubber Regenerating Co., Naugatuck, Conn.
1,321,403. Pneumatic cord tire. B. L. Stowe, Jersey City, N. J., assignor to Morgan & Wright, Detroit, Mich.
1,321,451. Rubber-dam clamp with multiple jaw. J. W. Ivory, Philadelphia, Pa.
1,321,452. Rubber-dam punch. J. W. Ivory, Philadelphia, Pa.
1,321,466. Tire with circumferential rib extended within and vulcanized to body portion to form air spaces. A. J. Meyer, Chicago, Ill.
1,321,545. Resilient wheel with pressure-exerting members of rubber. C. A. O'Neill, Revere, Mass., assignor to Demountable Spring Tire Co., New York City.
1,321,556. Pneumatic tire. J. K. Ross, Chicago, Ill.
1,321,688. Reinforced tire. T. J. Whalen, Kittanning, Pa.
1,321,719. Wheel rim structure composed of sections with vulcanizable facing on tread part, a vulcanizable tread band, etc. W. G. Chipley, Omaha, Neb. (Original application divided.)
1,321,791. Tire valve. E. E. Holt, Chicago, Ill.

ISSUED NOVEMBER 18, 1919.

1,321,833. Inflater and tester for toy balloons. O. G. Lyon, Akron, O.
1,321,879. Tire with rubber core. S. J. Barton, Chicago, Ill.
1,321,188. Demountable rim for tires. G. J. Clayton, Lakewood, N. J.
1,322,018. Corset with elastic inserts. J. L. Holt, Portland, Ore.
1,322,067. Transmission belt of rubberized fabric with leather ends. A. A. Somerville, Flushing, assignor to New York Belting & Packing Co., New York City—both in New York.
1,322,095. Collapsible rim for tires. C. B. Deeds, Savanna, Ill., assignor by mesne assignments to Lightning Change Rim Corp., Berrien Springs, Mich.
1,322,096. Collapsible rim for tires. C. B. Deeds, Savanna, Ill., assignor by mesne assignments to Lightning Change Rim Corp., Berrien Springs, Mich.
1,322,202. Curved woven puttee with elastic threads increasing in diameter from edge to edge. J. M. Roche, New York City.
1,322,276. Catamenial napkin with elastic straps. A. Wolff, New York City.
1,322,281. Sectional elastic tire filler. F. L. Bailey and J. H. La Grant, Wichita, Kans.
1,322,285. Cushion heel. I. E. Bremberg, Chicago, Ill.
1,322,321. Armored pneumatic tire. T. C. McEwen, Belleville, N. J.

ISSUED NOVEMBER 25, 1919.

1,322,529. Demountable rim for tires. R. S. Bryant, asssignor by mesne assignments to The Standard Parts Co.—both of Cleveland, O.
1,322,550. Tire interliner composed of metallic wool and graphite between layers of asbestos. T. V. Edmunds, Winston-Salem, N. C., assignor of ½ to R. G. Parker.
1,322,583. Tire valve. H. P. Kraft, Ridgewood, N. J.
1,322,608. Cushion tire. H. N. Palmer, Griswoldville, Mass.
1,322,636. Puncture-proof tire. D. W. Skogsbergh, Chicago, Ill.
1,322,639. Shampoo comb. C. H. Snider and L. D. Magrath, Conway, S. C.
1,322,685. Wheel with rim composed of cylindrical units shiftable to bring new bearing face into position, etc. J. A. Franklin, Pittsburgh, Pa.
1,322,720. Massage machine. Glenn S. Noble, Chicago, Ill.
1,322,734. Flexible, inflatable, heat-resistant rubber article for use in heat-curing sulphurized rubber tires. H. E. Smith, Cleveland Heights, O.
1,322,759. Armored tire. F. H. Van Loozen, Cleveland, O.
1,322,777. Pneumatic tire. M. C. Frank, Piedmont, assignor of ½ to N. Le Vene, San Francisco—both in California.
1,322,782. Pressure gage for tires. B. G. Gilbough, Los Angeles, Calif.
1,322,806. Life-saver for aviators. W. Marshall, Bridgeton, assignor of ½ to J. Westcott, Ocean City—both in New Jersey.
1,322,828. Life-saving device for use at sea. G. Salaman, London, Eng.
1,322,836. Garment supporter. E. M. Silvermann, assignor to Harris Suspender Co., a copartnership composed of E. M. and H. W. Silvermann—all of New York City.
1,322,862. Wrist fountain pen. I. Ziporyn, New York City.
1,322,884. Pressure gage for tires. E. Edelmann, Chicago, Ill., assignor to A. Schrader's Son, Inc., New York City.
1,322,905. Dust cap for tire valves. A. L. Just, Syracuse, N. Y.
1,322,984. Ice Bag. P. R. Wesley, assignor to Davol Rubber Co.—both of Providence, R. I.
1,323,060. Resilient wheel. E. Jacqmain and J. Kucharek, Brussels, Belgium. (Renewed.)
1,323,079. Pneumatic tire. J. J. Luck, San Antonio, Tex.
1,323,160. Elastic tire with soft rubber core and pneumatic tube. A. A. Crozier, London, Eng.
1,323,181. Anesthetic apparatus. W. V. Goodfellow, Los Angeles, Calif.
1,323,193. Traction ring for pneumatic and other cushion-tired wheels. G. C. Lambert, St. Paul, Minn.
1,323,217. Ventilating mask for patients. G. E. Darrow, San Francisco, Calif.

THE DOMINION OF CANADA.

ISSUED NOVEMBER 4, 1919.

193,571. Non-slipping rubber heel. B. W. Brockett, Cleveland Heights, O., U. S. A.
193,606. Solid tire. E. J. Hahn, Merrill, Ia., U. S. A.
193,640. Fastener for rubber heels. F. A. Nolan, St. Paul, Minn., U. S. A.
193,646. Heel pad. S. Schulhoff, Trenton, N. J., U. S. A.

ISSUED NOVEMBER 11, 1919.

193,736. Metatarsal arch support. L. Adair, Toronto, Ont.
193,778. Inner tube. A. E. Henderson, Toronto, Ont.
193,802. Rubber heel. F. A. Nolan, St. Paul, Minn., U. S. A.
193,810. Rubber stamp of the band type. F. Pitman, East Kew, Victoria, Australia.
193,831. Rubber-faced foot-pedal for automobiles. J. B. Stewart, Winnipeg, Man.

ISSUED NOVEMBER 18, 1919.

193,932. Demountable rim for tires. B. E. Braught, Cartwright, N. D., U. S. A.
193,971. Fountain pen. L. L. Gugel, Berea, Ky., U. S. A.
193,984. Pneumatic tire. E. F. Jones, Epson, Auckland, N. Z.
193,998. Semi-circular solid rubber tire with metallic tread. J. F. Loughran, Chehalis, Wash., U. S. A.
194,005. Gas mask. G. A. Mickleson, Vancouver, B. C.
194,019. Pneumatic tire. D. C. Roberts, Trenton, N. J., U. S. A.
194,051. Reinforced tire. A. W. Yambert, Sycamore, O., U. S. A.
194,073. Felt-lined rubber boot. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of F. Sage, Hastings, Mich., U. S. A.
194,102. Sectional tire. M. G. Bunnell, Decatur, and R. T. Whelpley, Chicago, assignee of a ⅔ interest—both in Illinois, U. S. A.
194,107. Skirt belting with rubber gripping elements. D. Basch, New York City, assignee of M. L. Basch, Brooklyn—both in New York, U. S. A.
194,114. Tire tread. J. M. Gilbert, New York City, assignee of F. B. Carlisle, Davisville, R. I., U. S. A.

ISSUED NOVEMBER 25, 1919.

194,072. Airplane structural element coated with hard rubber, etc. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of W. A. Gibbons, Flushing, L. I., N. Y., U. S. A.
194,180. Pneumatic suspension. A. Joey, Zurich, Switzerland.
194,189. Rubber-coated catgut for ratchet stringing. S. G. Lewis, Greensburg, Pa., U. S. A.
194,235. Reinforced tire. W. I. Varner, Athens, Ga., U. S. A.

THE UNITED KINGDOM.

ISSUED NOVEMBER 5, 1919.

132,099. Child's overall, with elastic inserted in hem. A. A. Fuller, 34 Upper Tollington Park, Finsbury Park, London.
132,109. Rubber stops, pads, buffers, etc., for door-stops, walking sticks, etc. F. C. Jones, 212 Upper Thames street, London.
132,110. Heel pad. J. Leach, Penmaen, Colwyn, Denbighshire.
132,181. Arch support. W. H. Robson and A. Powell, 7 New Oxford street, London.
132,204. Rubber soles for boots. W. J. Wicks, 244 Hoxton street, Hoxton, London.
132,206. Dating stamp, band type. W. T. Brassington, 29 Hockley street, Birmingham.
132,211. Reinforced composition soles. J. Y. Johnson, 47 Lincoln's Inn Fields, London. (F. Kellar, 208 Chancellor street, Philadelphia, Pa., U. S. A.)
132,378. Resilient blades for supporting billiard table cushions, with or without layers of sheet rubber between layers of wood. F. A. Alcock, 155 Elizabeth street, Melbourne, Victoria, Australia.
132,444. Revoluble rubber heel. W. H. Barnes, 271 Great Ancoats street, Manchester, and H. Vaudrey, Sandiway House, Altrincham, Cheshire.
132,502. Inflatable cushion for insertion between inner and outer soles of boots. G. E. C. Gerber, 36 rue des Chaussetiers, Clermont-Ferrand, Puy de Dôme, France.

ISSUED NOVEMBER 12, 1919.

132,579. Bifurcated, rubber-sheathed clip for attaching electric cables to balloon or kite cables, etc. E. G. Cleverly, Royal Air Forces, Roehampton, London.

Chemical Patents will be found on page 220. Machinery Patents on pages 222, 223.

132,582. Collapsible and folding boat of waterproof material, having inflatable side chambers. A. E. Ford, 42 North Audley street, London.
132,645. Fabric lining for outer covers of pneumatic tires, made of textile and rubber covered wires. N. I. Lipman, 125 Euston Road, London.
132,675. Ironing machine with rubber pad on lower board. L. W. Goold, 5 Corporation street, Birmingham. (American Laundry Machinery Co., Norwood Station, Cincinnati, O., U. S. A.)
132,692. Composition heels. F. A. Nolan, 216 New York Life Building, St. Paul, Minn., U. S. A.
132,746. Squilgee for washing windows. W. E. Moser, 11 Western Road, Merton Abbey, Surrey.
132,750. Adjustable rubber protector for soles of boots and shoes. W. J. Wicks, 244 Hoxton street, Hoxton, London. (Refers to Specification No. 132,204 above.)

ISSUED NOVEMBER 19, 1919.

132,902. Brushes for shaving, etc., made from strips of rubber slit to form bristles, some of which are perforated. H. Tomlinson, 5 George street, Hedon, Yorkshire.
132,927. Ankle joints of artificial feet, with rubber buffers, C. E. Hadlow, 88 Mortimer Road, Kensal Rise, London, and Pedestros, Limited, I Higham Road, Chesham, Buckinghamshire.
132,935. Non-slipping rubber block for end of walking stick, crutches, etc. J. T. Akerman, Mountcombe, Surbiton, Surrey.
132,946. Pads for cleaning windows, held in place by rubber bands, W. B. Fife, 9 Wyndham Road, Wallasey Village, Wallasey, Cheshire.
132,950. Bubble-blowing toy fitted with rubber tube and bulb. H. H. Griffiths, 8 Princess Road, Edgbaston, Birmingham.
132,962. Hand shields for cycles, etc. M. E. Parker, Ashley House, Galgate, Lancaster.

ISSUED NOVEMBER 26, 1919.

133,058. Rubber stoppers reinforced with insertion of metal, glass, etc. L. Goldmerstein, 29 West 39th street, New York City, U. S. A. (Not yet accepted.)
133,112. Kite balloon with funnel-shaped air inlet leading to ballonet and fitted with flap valve, etc. E. C. R. Marks, 57 Lincoln's Inn Fields, London. The Goodyear Tire & Rubber Co., 1144 East Market street, Akron, O., U. S. A.)
133,215. Pad for end of crutch, etc. R. L. G. Marix, 3 Clifford street, Bond street, London.

NEW ZEALAND.

ISSUED OCTOBER 16, 1919.

40,850. Splint rim for tires. W. W. McRae, Waikari, North Canterbury, N. Z.

ISUED OCTOBER 30, 1919.

41,860. Artificial foot and leg connected by piece of rubber forming ankle joint. J. Wyllie, Kershaw's Engineering Works, Nelson, N. Z.

TRADE MARKS.

THE UNITED STATES.

NO. 106,167. The word SOSCO—rubber erasers, etc., Spokane Office Supply Co., Spokane, Wash.
111,951. The representation of a kangaroo sitting within a tire—rubber and fabric tires and rubber inner tubes. Quick Tire Service, Inc., New York City.
113,146. The letters I S C A—felt and rubber insoles. Peterson-Franzen & Co., Chicago, Ill.
113,194. The word WONPIECE—rubber button bases, etc. Kabo Corset Co., Chicago, Ill.
113,751. The word CAREY—packings of asbestos, rubber, textiles, etc. The Philip Carey Manufacturing Co., Lockland, O.
114,571. The word EWALD—tire retreading and stapling machines, etc. Romort Manufacturing Co., Oakfield, Wis.
114,584. The word MASON inside an oval—rubber and fabric or rubber composition tires and tubes. The Mason Tire & Rubber Co., Kent, O.
114,876. Representation of bust of a Vyking and the letters YKING within the letter V, all superimposed on a tire—rubber tires. The Combination Rubber Manufacturing Co., Bloomfield, N. J.
115,259. The word DURBAR between parallel lines of stenciled dashes—stitched and impregnated canvass belting. The Rossendale-Reddaway Belting & Hose Co, Newark, N. J.
116,127. The word CRESCENT within a crescent—fountain pens. The Conklin Pen Manufacturing Co., Toledo, O.
116,141. The word SHALER within a conventionalized rectangle—vulcanizers. C. A. Shaler Co., Waupun, Wis.
116,668. The word FLEXO—garters, etc. A. Stein & Co., Chicago, Ill.
117,449. The word VADACOL on a scroll—rubber tires. The Dry Climate Tire Manufacturing Co., Arvada, Colo.
117,904. Representations of back view of body of pugilist within a tire, both behind the word RESISTO within a rectangle—suspenders, belts, garters, etc. Joseph Silberman, Baltimore, Md.
118,041. The word IMPERIAL—mechanical rubber goods. Boston Belting Corp., Boston, Mass.
118,108. The words PARA BOND within a shaded circle—tire patches. Emco Manufacturing Co., Inc., Binghamton, N. Y.
118,447. Representation of a label bearing a scroll, a reindeer within concentric circles, and corner ornaments—elastic webs. W. Preston & Son, Limited, Leicester, England.
118,448. The word RACINE—rubber and fabric tires. Racine Rubber Co., Racine, Wis.
118,532. The words DRI-PED within a diamond—rubber, fabric, leather and combination shoes, boots, slippers, and weltings, William Walker & Sons, Limited, Bolton, England.
118,631. The words AMERICAN AKRON so combined that the A and N form the first and last letters of both words—pneumatic and rubber tires, inner tubes, patches, reliners, tire boots and flaps, pneumatic rubber bags for making repairs, valve pads and retread bands. The American Rubber and Tire Co., Akron, O.
119,296. The words MASTER RID—inner tubes. Essex Rubber Co., Trenton, N. J.
119,487. The words "LET THE TIRE BREATHE"—tire-ventilating valves. Thomas Colden McEwen, Belleville, N. J.
119,508. The words FOAMITE FIREFOAM arranged over one another so that the letter F begins both words—hand-operated portable and stationary fire extinguishers. Foamite Firefoam Co., New York City.
119,746. The word ROAMER—rubber tires and tubes. The National Tire & Rubber Co., East Palestine, O.
119,829. The words GOODYEAR TRIANGLE weekly house organ. The Goodyear Tire & Rubber Co., Akron, O.
120,052. The words DOE BOY—rubber heels. Granger Vacuum Rubber Heel Co., Cleveland, O.
120,077. The word RESEVO—fountain pens. A A. Waterman & Co., Chicago, Ill.
120,137. The word TREX—tire-removing tools. Trexler Rim Compressor Co., Philadelphia, Pa.
120,228. The word UZOLD—rubber tires. The Uzold Tire & Rim Co., Cleveland, O.
120,453. The words TOM BROWN—rubber and rubber and leather shoes, etc. Filene's Sons Co., Boston, Mass.
120,477. The word CORONA within a double-outlined diamond-inner tubes, tires, and rubber packing. Corona Rubber Reclaiming Co. (now by change of name Corona Rubber Manufacturing Co.), Philadelphia, Pa.
120,731. The word CHERUB—waterproof diaper covers. The Warner Bros., Co., Bridgeport, Conn.
121,101. The words AM-ER-NAT—rubber boots and shoes, etc., American-National Shoe & Leather Corp., New York City.
121,104. Representation of an Indian's head above the words AM-ER-NAT, within the outline of an arrow-head—rubber boots and shoes, etc. American-National Shoe & Leather Corp., New York City.
121,151. Representation of a girl's head with a piece of chewing gum held between the lips and the words "GETS IT" above the head—chewing gum. David Millhauser. New York City.
121,377. The word SACO-RUBBERS, etc. J. G. Asay Co., Inc., Philadelphia, Pa.
121,481. The words DRI-BOY—raincoats. New York Mackintosh Clothing Co., Mamaroneck, N. Y.
121,482. The words DRI-GIRL—raincoats. New York Mackintosh Clothing Co., Mamaroneck, N. Y.
121,606. The words ANTI-PYRE—chewing Gum. George W. Todd, Omaha, Neb.

THE DOMINION OF CANADA.

25,326. The word CONDENSITE—phenol-methylene liquid, semi-solid and solid plastic compounds. Condensite Co. of America, Bloomfield, N. J., U. S. A.
25,334. Representation of Mephisto head on background formed by the letters "AB"—insulated cables, etc. American Bosch Magneto Corp., Brightwood, Springfield, Mass., U. S. A.
25,357. Representation of a booted swastika—rubber soles or pads for heels. The St. Helens Cable & Rubber Co., Limited, The Electric Cable & Rubber Works, Bank Quay, Warrington, Lancaster, England.
25,401. The word DEFIANCE—all kinds of rubber goods. Van der Linde Rubber Co., Limited, Toronto, Ont.
25,403. The initials "A. H." in heavy block letters contacting and united by a bar forming the cross arms of both "A" and "H" and extending in both directions beyond the initials—rubber and other kinds of tires, soft rubber goods, druggists' sundries, foot-ball bladders, etc. Ames Holden Tire Co., Limited, Montreal, Que.
25,404. The initials "A. H. M.", the "A" contacting with the "H" and contiguous legs of the "H" and "M" merged in a single leg, the initials being united by an arm forming the cross arms of both "A" and "H" and extending in both directions beyond the initials—rubber and other kinds of tires, soft rubber goods, druggists' sundries, foot-ball bladders, etc. Ames Holden Tire Co., Limited, Montreal, Que.
25,407. The initials "A. H. M." and the word "SYSTEM," the letter "A" contacting with the "H" and the contiguous legs of the "H" and "M" merged in a single leg, and the initials and the word "SYSTEM" being inclosed in a circle containing a black background—rubber and other goods. Ames Holden McCready, Limited, Montreal, Que.
25,414. The word PHILCO—battery separators or retainers of rubber. Philadelphia Storage Battery Co., Philadelphia, Pa., U. S. A.

THE UNITED KINGDOM.

385,760. Representation of a winged foot dividing the word GOODYEAR—goods of rubber and gutta percha not in classes other than No. 40. The Goodyear Tire & Rubber Co., Akron, O., U. S. A. (Care of Marks & Clerk, 57-58 Lincoln's Inn Fields, London, W.C.2.)
388,539. The word REGENT—elastic garters, sleeve bands, hat cords, etc. W. J. Adams & Co., copartnership, 20 Mount street, Manchester.
389,310. The word FOAMITE—fire extinguishing apparatus. MacAndrews & Forbes, Limited, 2 Broad street Place, London, E. C. 2.
389,616. Representation of a label bearing the initials C. L. & S. and the words CHARLESON SERIES SUBEBONY WARE—toilet receptacles, glove stretchers, handles of buttonhooks, etc., of vulcanite. C. and L. C. Lane, copartners, 58 Corporation street, Birmingham.
390,110. The words FOAMITE FIREFOAM—fire extinguishing apparatus. MacAndrews & Forbes, Limited, 2 Broad street Place, London, E. C. 2.
390,111. The words FOAMITE FIREFOAM—fire extinguishing systems and plant. MacAndrews & Forbes, Limited, 2 Broad street Place, London, E. C. 2.
390,112. The words FOAMITE FIREFOAM—fire extinguishing compounds. MacAndrews & Forbes, Limited, 2 Broad street Place, London, E. C. 2.
392,104. Representation of a label bearing a lion above a pile of tires and the words NORTH BRITISH CLINCHER MOTOR TYRES—rubber tires. The North British Rubber Co., Limited, Castle Mills, Fountainbridge, Edinburgh, Scotland.
392,385. Representation of a signature E. I. M. GAYFER—sanitary belts. E. I. M. Gayfer, 11 Green street, Charing Cross Road, London, W. C. 2.
393,190. The word HERMETIC—brake blocks, driving belts, and matting of rubber or similar materials. The Self-Sealing Rubber Co., Limited, Ryland street, Birmingham, Warwickshire.

[illegible]. The word [illegible]—French chalk and dressing for improving the appearance of tires and other rubber articles. The Self-Sealing Rubber Co., Limited, Ryland street, Birmingham.
393,338. The word FIXAGRIFS—rubber heels. J. Giraud, 96 rue de Rivoli, Paris, France. (Care of Marks & Clerk, 57-58 Lincoln's Inn Fields, London, W. C. 2.)
393,611. The word FLAPPER—rubber sponges, etc. G. W. Beldham, Boston Lodge, Windmill Road, Ealing, Middlesex.
393,940. Representations of a label with a checkered border bearing within a circle the picture of a light-house and rocks; against this as background the figure of a man putting on a raincoat; the the words DRYCO RAINCOATS FOR FATHER AND SON, FOR RAIN OR SHINE. BARNETTS THE COAT HOUSE—raincoats. Mark Barnett, trading as Barnetts, 24 Scotland Road, Nelson, Lancashire.
393,971. The word WINTERSY—dental rubber, sponges, etc. H. Winter, 30 Aldermanbury, London, E. C. 2.
[illegible]. The word [illegible]—rubber tires, etc. Société Generale des Etablissements Bergougnam, 8 Boulevard Berthelot, Clermont-Ferrand, Puy de Dôme, France. (Care of Marks & Clerk, 57-58 Lincoln's Inn Fields, London, W. C. 2.)
[illegible]. The word FLEXOR—rubber tires. The Dunlop Rubber Co., Limited, 150-152, Clerkenwell Road, London, E. C. 1.
[illegible]. The word FIBRAZ—vulcanizing compounds for repairing tires. Harvey Frost & Co., Limited, 148-150 Great Portland St., London, W. 1.

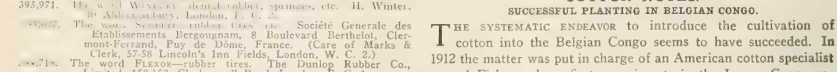
NEW ZEALAND.

[illegible]. The word SWORD—rubber tires and tubes, and tire casings. Solomon Harry Goldberg, 1918 Prairie avenue, Chicago, Ill., U. S. A.

DESIGNS.

THE UNITED STATES.

NO. 54,063. Tire. Patented November 4, 1919. Term 14 years. J. Christy, Cleveland, assignor to The Portage Rubber Co., Barberton—both in Ohio.
54,070. Tire casing. Patented November 4, 1919. Term 14 years. F. S. Dickinson, New York City.
54,090. Tire. Patented November 4, 1919. Term 14 years. G. F. Hoffman, Akron, O.
54,109. Surf rider. Patented November 4, 1919. Term 3½ years. J. P. McCarty and F. W. Falck, Los Angeles, assignors to Pneumatic Surf Fish Co., San Francisco—both in California.
54,114. Tire. Patented November 4, 1919. Term 14 years. C. L. Moody and T. Midgley, Springfield, Mass.
54,120. Tire. Patented November 4, 1919. Term 7 years. E. S. Phillips, assignor to The Yale Tire & Rubber Co.—both of New Haven, Conn.
54,121. Tire. Patented November 4, 1919. Term 7 years. E. S. Phillips, assignor to The Yale Tire & Rubber Co.—both of New Haven, Conn.



54,063 54,070 54,090 54,114 54,120 54,121 54,122 54,123 54,124 54,143 54,153 54,185 54,186 54,193

54,122. Tire. Patented November 4, 1919. Term 14 years. R. M. Pierson, Akron, O., assignor to The B. F. Goodrich Co., New York City.
54,123. Tire. Patented November 4, 1919. Term 14 years. R. M. Pierson, Akron, O., assignor to The B. F. Goodrich Co., New York City.
54,124. Tire. Patented November 4, 1919. Term 14 years. R. M. Pierson, Akron, O., assignor to The B. F. Goodrich Co., New York City.
54,143. Tire tread. Patented November 4, 1919. Term 14 years. H. F. Stansbury and J. F. Davis, Scranton, Pa.
54,153. Tire casing. Patented November 4, 1919. Term 14 years. O. L. Weaver, assignor to The Star Rubber Co.—both of Akron, O.
54,185. Tire tread. Patented November 11, 1919. Term 14 years. C. A. Swinehart, assignor to The Victor Rubbber Co.—both of Springfield, O.
54,186. Tire tread. Patented November 11, 1919. Term 14 years. R. H. Syfers, Indianapolis, Ind.
54,193. Non-skid tire. Patented November 18, 1919. Term 14 years. P. I. Anderson, assignor to The Black Hawk Tire & Rubber Co.—both of Des Moines, Ia.

THE DOMINION OF CANADA.

4,665. Rubber heel. Patented October 22, 1919. R. S. Smart, Ottawa, Ont.

FEE FOR TEMPORARY FILING OF TRADE-MARKS AND PATENTS IN CHINA.

In accordance with instructions from the inspector-general of Chinese customs, a fee of Haikwan taels 5.00 will, from August 1, 1919, be charged for each trade-mark or patent filed for provisional registration at the branch office of the trade-marks bureau at Shanghai.

When fees are remitted by persons living in foreign countries, Mexican $7.50 will be accepted as the equivalent of Haikwan taels 5.00. This fee will be payable until the regulations for the registration of trade-marks and patents come into force, when it will be subject to whatever modification the said regulations may prescribe.

Application for registration at Shanghai must still be made through the American consulate-general, and, to avoid delay and exchange complications, should, in every case, be accompanied by a remittance of Mexican $7.50, payable to the commissioner of customs, Shanghai.—"The Official Gazette."

COTTON NOTES.

SUCCESSFUL PLANTING IN BELGIAN CONGO.

THE SYSTEMATIC ENDEAVOR to introduce the cultivation of cotton into the Belgian Congo seems to have succeeded. In 1912 the matter was put in charge of an American cotton specialist named Fisher, whose first experiments in the Lower Congo region failed because of irregular rains. In 1915 Nyangwe, a region in Manyema, where the climate is more settled and rain is more abundant, was planted to the extent of 55 acres, which were increased to about 3,600 acres by 1919.

Satisfactory results were also obtained in the Sankurke and Kassai regions, where about as many more acres are under cultivation, which means a yield of 600 or 700 tons of cotton. The Welle region, where the climate is suitable and the natives are industrious, will be tried next. American ginning machinery has been imported and has been set up at Kibombo and Lusambo, the collecting points. The Congo cotton sold in Liverpool has been graded as middling and good middling. The first lots of Congo cotton that reached Antwerp after the armistice sold well; the latest cargo brought 5,900 piculs, or $11.40 a ton.

COLOMBIA COTTON.

Cotton raising is neglected in Colombia, although what is grown under unfavorable circumstances is very fine, and of long staple. It is planted without previous preparation of the soil except cutting down and burning off the brush; weeds are chopped out with machetes. It needs to be replanted only once in five years and the yield is about 400 pounds an acre the first year and 800 pounds an acre after that.

In 1914 Colombian cotton sold for 24 cents in Liverpool; the output was 789,390 pounds. In 1917 Colombian cotton worth $23,777 was shipped to the United States. At present not enough is raised to supply the local demand and cotton has to be imported.

COTTON SINCE THE WAR.

Comparisons between the cotton crop of the United States in 1914 and in 1918, show a decline in acreage and production but an increase in value. In 1914 the number of acres planted was 36,832,000, which produced 16,135,000 bales of cotton, valued on the plantation at $549,036,000; in 1918 the acres were 35,890,000, bearing 11,700,000 bales, valued at $1,616,207,000. The price of cotton at the plantation on December 1 was 6.8 cents per pound in 1914; in 1918 it was 27.6 cents per pound.

EGYPTIAN COTTON CROP 1919-1920.

The Egyptian cotton crop for 1919-1920 is estimated at 6,000,000 cantars of 99 pounds, or 5,940,000 pounds, according to Consul Garrels of Alexandria. The crop for the financial year ended August 31, 1919, was 5,927,460 cantars, of which 443,000 cantars remained on hand on that date. The exports, in Egyptian bales of 750 pounds, amounted to 718,309 bales, of which 459,744 bales went to England, 95,262 to the United States, 78,487 to France, 49,328 to Italy, 22,160 to Japan, 10,436 to Spain, 2,602 to Greece and Syria, 250 to Portugal and 10 bales to the Dutch East Indies.

Review of the Crude Rubber Market.

NEW YORK.

The crude rubber market has shown a slow but steady advance throughout the month and was very firm in the last week of December so that the year ends with prices at the highest point they have shown in some months. While the demand continues, the steadiness is due in large part to the firm handling of the Singapore and London markets. The excessive stock in the East, if it existed, has not been poured upon the market; the American demand, which was put at 300,000 tons or more, will be met by the importation of not more than 250,000 tons for 1919.

Prices for plantation and South American rubber at the beginning and toward the close of the month are shown in the following quotations:

PLANTATIONS. DECEMBER 2, first latex crêpe, spot 53 cents, futures 53@53¼ cents. DECEMBER 31, spot 54¾@55 cents, futures 55 cents. JULY-DECEMBER, 55¼ cents.

DECEMBER 2, Ribbed smoked sheets, spot, 52½@53 cents, futures 52½@53 cents. DECEMBER 31, spot 54¾@55 cents, futures 54¾@55 cents.

DECEMBER 2, No. 1 amber crêpe, spot 51 cents, futures 51 cents. DECEMBER 31, spot 53@53½ cents, futures 53@53½ cents.

DECEMBER 2, clear thin brown crêpe, spot 47 cents, futures 47½ cents. DECEMBER 31, spot 48¾@49 cents, futures 48¾@49 cents.

DECEMBER 2, No. 1 roll brown crêpe, spot 42½@43 cents, futures 42½ cents. DECEMBER 31, spot, 43½ cents, futures 42½ cents.

SOUTH AMERICAN PARÁS AND CAUCHO. DECEMBER 2, spot prices upriver fine 49 cents, islands fine 48 cents, upriver coarse 36 cents, islands coarse 22 cents, Cametá coarse 22@23 cents, Caucho ball 35 cents. DECEMBER 31, upriver fine 49 cents, islands fine 46¾ cents, upriver coarse 36½ cents, islands coarse 22 cents, Cametá coarse 23½ cents, caucho ball 35½ cents.

NEW YORK QUOTATIONS.

Following are the New York spot quotations, for one year ago, one month ago and on December 31, the current date:

	January 1, 1919.	December 1, 1919.	December 31, 1919.
PLANTATION HEVEA—			
First latex crêpe	$0.54 @	$0.52¼ @	$0.55 @
Amber crêpe No. 1	.48 @	.51 @	.53 @
Amber crêpe No. 2	.47 @	.50 @	.52 @
Amber crêpe No. 3	.46 @	.49 @	.51 @
Amber crêpe No. 4	.45 @	.47 @	.49 @
Brown crêpe, thick and thin clean	.45 @	.47 @	.49 @
Brown crêpe, thin specky	.40 @	.45 @	.45 @
Brown crêpe, rolled	.35 @	.43 @	.43½ @
Smoked sheet, ribbed, standard quality	.52 @	.53¾ @	.55 @
Smoked sheets, plain, standard quality	.51 @	.54 @	.50 @
Unsmoked sheet, standard quality	.47 @	.52 @	.48 @
Colombo scrap No. 1	.38 @	.35 @	.38 @
Colombo scrap No. 2	.36 @	.34 @	.36 @
EAST INDIAN—			
Assam crêpe	.36 @ .37	.49 @	.49 @ .50
Assam onions	.44 @ .45	.47 @	@
Penang block scrap	.38 @.42	@	.38½ @
PONTIANAK			
Banjermassin	.14½ @	.11½ @ .14	.13 @
Palembang	.14¼ @	.13 @	.14 @
Pressed block	.18½ @	.24 @ .27	.24 @
Sarawak	@	.11 @	.12 @
SOUTH AMERICAN—			
PARÁS—			
Upriver fine	.61 @	.49 @ .50	.50 @
Upriver medium	.55 @	@	@
Upriver coarse	.35½ @	.36 @	.37 @
Upriver weak, fine	.51 @	.40 @	.40 @
Islands, fine	.52 @	.47½ @ .48	.47 @
Islands, medium	.45 @	.47 @ .48	.47 @ .48
Islands, coarse	.23½ @	.22 @ .23	.22 @
Cametá, coarse	.24 @	[illegible] @	.24 @ .25
Madeira, fine	.56 @	.51 @ .51½	.51 @ .52
Acre Bolivian, fine	.56 @	.51 @ .51½	.51 @ .52
Peruvian fine	.55 @	.50 @	.51 @ .52
Tapajos fine	@	.50 @	.50 @
CAUCHO—			
Lower caucho ball	.34 @	.32 @ .34	.29 @
Upper caucho ball	.35 @	.34 @ .35	.34 @
MANIÇOBAS—			
Ceara negro heads	.35 @	@	@
Ceara scrap	.35 @	@	@
Maniçoba (30% guarantee)	@	@	@
Mangabeira thin sheet	@	@	@
CENTRALS—			
Corinto scrap	.37 @	.34 @ .34½	.34½ @ .35
Esmeralda sausage	.36 @.36½	.34 @ .34½	.34½ @ .35
Central scrap	.35½ @ .36	.33 @ .34	.34 @
Central scrap and strip	.33 @ .35	.32 @ .32½	.32 @ .33
Central wet sheet	@	.22 @ .23	.23 @
Guayule (20% guarantee)	.26 @.27	.28 @	.28 @
Guayule, washed and dried	@	.38 @	.38 @
	@	@	@
AFRICANS—			
Niger flake, prime	.28 @	.18 @	.18 @
Benguela, extra No. 1, 28%	.33 @	@	@
Benguela No. 2, 32½%	.29 @	@	@
Congo prime, black upper	.48 @	.37 @	.37 @
Congo prime, red upper	.48 @	@	@
Kassai black	.48 @	.37 @ .38	.37 @
Rio Nunez ball	.55 @	@	@
Rio Nunez sheets and strings	@	.42 @	.40 @
Conakry niggers	.51 @	.42 @	.40 @
Massai sheets and strings	@	.42 @	.40 @
GUTTA PERCHA—			
Gutta Siak	.23 @.24	.25 @	.27½ @
Red Macassar	2.90 @2.95	2.85 @	2.60 @
BALATA—			
Block, Ciudad, Bolivar	.69 @.70	.60 @.64	.59 @
Colombia	.58 @ .59	.53 @.55	.53 @
Panama	.57 @ .58	.43 @.45	.45 @
Surinam sheet	@	.88 @	.86 @
amber	@	.90 @	.90 @

RECLAIMED RUBBER.

There has been only moderate activity in the reclaimed rubber market during December. Prices are firm with upward tendency, and reclaimers are anticipating renewed activity following the first of the year inventory period.

NEW YORK QUOTATIONS.

DECEMBER 29, 1919.

Prices subject to change without notice.

Standard reclaims:			
Floating	.30	@	.35
Friction	.25	@	.35
Mechanical	.11½	@	.12½
Red	.11½	@	.12½
Shoe	.15¼	@	.15¾
Tires, auto	.15¾	@	.17
truck	.12	@	.13
White	.22	@	.25

COMPARATIVE HIGH AND LOW SPOT RUBBER PRICES.

November.

	1919.*	1918.	1917.
PLANTATIONS:		Allocated and Free.	
First latex crepe	$0.54½ @ .53	$0.63 @ .41	$0.64 @ .57
Smoked sheet ribbed	.54 @ .52	.61½ @ .46	.62 @ .55½
PARAS:			
Upriver, fine	.52 @ .49	.68 @ .57½	.63 @ .55
Upriver, coarse	.35 @ .34½	.40 @ .31	.44½ @ .47
Islands, fine	.48½ @ .48	.50 @ .44	.49 @ .45
Islands, coarse	.23½ @ .21½	.27 @ .21½	.27½ @ .25
Cametá	.23 @ .23	.28 @ .21	.27½ @ .25

*Figured only to November 28, 1919.

December.

	1919.*	1918. Allocated and Free	1917.
PLANTATIONS:			
First latex crêpe	$0.55 @ $0.51	$0.58 @ $0.54	$0.59 @ $0.52¼
Smoked sheet ribbed	.55 @ .51	.56 @ .52	.58 @ .50
PARAS:			
Upriver fine	.49 @ .47	.66 @ .62	.62 @ .57
Upriver coarse	.36½ @ .35	.39½ @ .36½	.42 @ .37
Islands fine	.48½ @ .46¾	.57 @ .53	.51 @ .47
Islands, coarse	.22 @ .21	.25 @ .24	[illegible] @ [illegible]
Cametá	.23½ @ .22	.26 @ .25	.26½ @ .24½

*Figured to December 31, 1919.

THE MARKET FOR COMMERCIAL PAPER.

In regard to the financial situation, Albert B. Beers, broker in crude rubber and commercial paper, No. 68 William street, New York City, advises as follows:

"The demand for commercial paper during December has been very limited, and almost entirely from out-of-town banks, the best rubber names being taken at 6 per cent to 6¼ per cent, and those not so well known 6½ per cent, rates being very firm the last half of the month."

SINGAPORE RUBBER REPORT.

GUTHRIE & CO., LIMITED, Singapore, report [November 6, 1919]:

The usual weekly rubber auctions which opened on Wednesday were marked by a good demand for all grades which continued throughout the sales. Fine pale crêpe sold at up to 97 cents, showing an advance on last week of 1½ cents. Ribbed smoked sheet realized up to 97½ cents or 1 cent better than last auction.

The principal feature of the sales was the demand for lower grades (particularly fine brown crepe) which were 2½ to 5 cents up on the week.

Out of 1,072 tons catalogd 918 tons were offered and 683 tons sold.

The following is the course of values:

	In Singapore, per Pound.[1]			Sterling Equivalent per Pound in London.		
Sheet, fine ribbed smoked	94c	@	97½c	2/ 4¾	@	2/ 5¾
Sheet, good ribbed smoked	8[illegible]	@	93½	2/ 2⅞	@	2/ 4⅜
Crêpe, fine pale	95½	@	97	2/ 5¾	@	2/ 6⅛
Crepe, good pale	86½	@	93	2/ 3⅛	@	2/ 5
Crêpe, fine brown	75	@	83	2/	@	2/ 2¼
Crêpe, good brown	69	@	75	1/10¼	@	2/
Crêpe, dark	64	@	71	1/ 8⅞	@	1/10¾
Crêpe, bark	61	@	65½	1/ 8	@	1/ 9¼

[1]Quoted in S. S. Currency. $1 = $0.567.

FEDERATED MALAY STATES RUBBER EXPORTS.

It is reported by official report from Kuala Lumpur states that the exports of plantation rubber from the Federated Malay States in the month of October amounted to 8,381 tons, compared with 9,841 tons in September and 5,901 tons in the corresponding month of last year. The total exports for ten months of the present year were 88,205 tons, against 64,043 tons in 1918 and 65,927 tons in 1917. Appended are the comparative statistics:

	1917.	1918.	1919.
January ... *tons*	5,995	7,588	7,163
February	7,250	6,820	10,809
March	7,088	7,709	10,679
April	5,955	7,428	7,664
May	7,179	5,851	7,308
June	6,009	5,161	7,094
July	5,798	5,706	8,640
August	6,487	5,291	10,626
September	7,087	6,588	9,841
October	7,079	5,901	8,381
Totals	65,927	64,043	88,205

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official report from Singapore states that the export of plantation rubber from the Strait Settlement ports in the month of October as 8,338 tons as against 10,476 tons in September and 3,260 tons in the corresponding month last year. The total exports for ten months of the present year aggregate 118,290 tons, compared with 54,876 tons in 1918 and 61,034 tons for the corresponding period in 1917. Appended are the comparative statistics:

	1917.	1918.	1919.
January ... *tons*	3,562	4,302	14,404
February	6,495	2,334	15,661
March	8,299	8,858	20,908
April	6,103	6,584	10,848
May	6,282	13,587	15,845
June	8,775	6,515	5,059
July	7,351	1,978	7,818
August	3,786	1,249	8,933
September	5,679	6,209	10,476
October	4,702	3,260	8,338
Totals	61,034	54,876	118,290

(Transhipments amounted to 832 tons.)

BATAVIA RUBBER MARKET.

HERMANS, MARSMAN & CO., Batavia, report [September 18-October 15, 1919]:

The market opened with small demand for first crêpe and smoked sheets and more demand for the lower grades. During the month under review the tone of the market was rather steady, although only a little business was done. The market closed firm with a fair demand for all grades, especially for prompt deliveries. The quotations are:

	In Batavia Per ½-kilo.[1] Guilders.	Equivalent Per ½-kilo in U. S. Currency.
Fine pale crêpe	1.33	$0.532
First pale crêpe	1.32	0.528
Prime smoked sheets	1.32½	0.530

[1]Quoted per ½-kilo (1.1 pounds) in Dutch Indian guilders ($0.40).

ANTWERP RUBBER MARKET.

GRISAR & CO., Antwerp, report [December 12, 1919]:

The market for the past three weeks has been very steady, with slightly rising prices. Dealings have been larger and the African rubbers, which had been neglected hitherto, are again attracting serious interest. The sales last week amounted to 224 tons, and the stock on hand in the port of Antwerp was about 925 tons. Some of the prices obtained were: Congo Kassai red 3.90 francs to 5.50 francs per kilogram, according to quality; upper Congo Kutanga, 5 francs; upper Congo ordinary red, 4.80 francs; upper Congo ordinary black, 6 francs; upper Congo équateur, 5.25 francs. The Congo plantation *Hevea* rubber fetched 9.70 francs for smoked sheets, and 9.10 for biscuits.

AMSTERDAM MARKET REPORT.

JOOSTEN & JANSSEN, Amsterdam, report [December 12, 1919]:

The still decreasing rate of exchange of the £ had an unfavorable influence on the market and the tendency was consequently dull and very quiet.

During this week the turnover and demand were small, and through the London market closed somewhat firmer, this has not affected the Amsterdam quotations, and buyers are not inclined to pay more than f. 1. 35 for spot standard crêpe.

The turnover on the terminal market was very small.

EXPORTS OF CRUDE RUBBER FROM BELAWAN (DELI), SUMATRA.

	August.		Eight Months Ended August 31.	
	1918.	1919.	1918.	1919.
To Netherlands *pounds*	......	1,239,646	......	2,123,698
United Kingdom	400,531	538,281	3,067,036	6,862,747
Italy	......	......	......	134,080
United States	47,313	2,920,774	6,211,529	11,833,719
Canada	......	......	132,328	......
British India	......	......	......	330,756
Japan	......	......	......	2,160
Australia	......	......	......	405,514
Singapore	1,127,926	1,507,283	10,966,028	15,168,483
Penang	10,329	98,019	317,654	......
Totals, pounds	1,586,098	6,083,602	21,236,221	37,054,966

PLANTATION RUBBER EXPORTS FROM JAVA.

	September.		Nine Months Ended September 30.	
	1918.	1919.	1918.	1919
To Holland—*kilos*	......	582,000	......	1,563,000
England	......	905,000	1,659,000	5,686,000
France	......	39,000	......	215,000
United States	200,000	1,832,000	4,654,000	13,410,000
Australia	......	......	354,000	245,000
Singapore	611,000	384,000	6,485,000	3,964,000
Japan	11,000	1,000	667,000	180,000
Other countries	......	126,000	393,000	159,000
Totals	822,000	3,869,000	14,212,000	25,422,000
Ports of origin:				
Tandjong Priok	326,000	1,614,000	7,507,000	13,314,000
Samarang	......	85,000	125,000	430,000
Soerabaya	264,000	2,121,000	6,349,000	10,872,000
Totals	590,000	3,820,000	13,981,000	24,616,000

EXPORTS OF INDIA RUBBER FROM PARA, MANAOS AND IQUITOS DURING THE MONTH OF SEPTEMBER, 1919.

	NEW YORK.					EUROPE.					
EXPORTERS.	Fine.	Medium.	Coarse.	Caucho.	Totals.	Fine.	Medium.	Coarse.	Caucho.	Total.	Grand Totals.
Stowell & Co. ... *kilos*	119,679	12,422	20,617	51,238	203,956	......	......	......	......	......	203,956
J. Marques	139,212	21,387	140,365	67,264	368,228	35,180	......	......	......	35,180	403,408
Chamié & Koury Co., Limited	135,141	14,104	30,643	152,400	332,288	......	......	......	......	......	332,288
General Rubber Co.	145,973	8,611	53,400	3,754	211,738	11,220	510	......	......	11,730	223,463
Suarez, Filho & Co.	214,408	......	......	......	214,408	......	......	......	......	......	214,408
Alfredo Valle & Co.	91,049	17,732	36,690	4,950	150,421	......	......	......	51,150	51,150	201,571
Berringer & Co.	97,056	2,901	7,947	64,291	172,195	......	......	......	......	......	172,195
Ferreira, Costa & Co.	......	......	660	64,480	65,140	......	......	......	......	......	65,140
Bitar Irmãos	15,511	1,275	26,857	20,827	......	......	......	......	......	......	65,140
Sundries	26,885	4,053	9,420	151,392	191,750	19,417	1,093	544	......	21,054	212,804
From Pará	984,914	82,485	326,599	580,596	1,974,594	65,817	1,603	544	51,150	119,114	2,093,708
From Manáos	595,121	113,710	233,200	575,200	1,517,701	73,570	......	2,573	......	76,143	1,593,844
From Iquitos	17,762	......	969	3,082	21,813	37,854	791	7,032	11,621	57,298	79,111
Totals	1,597,797	196,195	560,768	1,159,348	3,514,108	177,241	2,394	10,149	62,771	252,555	3,766,663

(Compiled by Stowell & Co., Pará, Brazil.)

ANTWERP RUBBER ARRIVALS.

DECEMBER 3. By the steamer *Albertville* from the Congo

Bungé & Co. (Grands Lacs) .... kilos	5,482
Bungé & Co. (Belgika)	21,858
Bungé & Co. (Comptoir Commercial Congolais)	1,959
Bungé & Co.	1,004
Bungé & Co.	3,475
Société Coloniale Anversoise (S. A. B.)	6,436
Others	22,050
Total .... kilos	62,264

CRUDE RUBBER ARRIVALS AT NEW YORK AS STATED BY SHIPS' MANIFESTS.

PARAS AND CAUCHO AT NEW YORK.

Pounds.

	Fine.	Medium.	Coarse.	Caucho.	Mixed Rubber.	Totals. Pounds.
NOVEMBER 18. By the S. S. *Byron*, from Rio de Janeiro, Santos and Pará.						
Rodney D. Chipp	......	......	......	......	......	28,911
Neuss, Hesslein & Co.	......	......	......	6,779	......	62,799
F. R. Henderson & Co.	......	......	......	137,500	......	20,600
G. Amsinck & Co., Inc.	......	......	......	......	......	43,685
William Schall & Co.	......	......	......	......	......	33,450
Poel & Kelly	......	......	......	......	......	122,847
Gaston, Williams & Wigmore	......	......	......	......	......	57,304
H. A. Astlett & Co.	13,600	......	7,000	......	......	20,600
Paul Bertuch	89,485	......	......	......	......	89,485
Various	......	......	......	......	......	246,605
NOVEMBER 20. By the S. S. *Manco*, from Manaos and Pará.						
Poel & Kelly	241,133	26,000	24,500	......	17,200	308,833
G. Amsinck & Co., Inc.	......	......	......	......	......	208,271
H. A. Aslett & Co.	101,000	......	113,000	68,500*	12,000	292,000
Hagemeyer & Brun	......	......	......	......	......	26,684
Cowdrey & Co.	......	......	......	......	......	11,467
Gaston, Williams & Wigmore	......	......	......	......	......	97,725
C. T. Wilson & Co., Inc.	......	......	......	......	......	7,295
Lazard Frères	......	......	......	......	......	80,185
Paul Bertuch	59,963	......	41,045	79,631	......	180,639
Meyer & Brown, Inc.	11,000	......	......	28,900	......	39,900
Various	......	......	......	......	......	880,729

* Cametá.

	Fine.	Medium.	Coarse.	Caucho.	Mixed Rubber.	Totals. Pounds.
NOVEMBER 23. By the S. S. *Eten*, from Liverpool.						
Meyer & Brown, Inc.	......	......	......	......	......	220,400
NOVEMBER 26. By the S. S. *Frankmere*, from Santa Lucia and South America.						
Various	......	......	......	......	......	158,468
DECEMBER 1. By the S. S. *Zingara*, from Pará.						
Poel & Kelly	......	......	......	......	......	10,169
Aldens' Successors, Inc.	......	......	......	......	......	1,133
General Rubber Co.	......	......	......	......	......	6,230
H. A. Astlett & Co.	78,300	......	21,500	......	......	99,800
Various	......	......	......	......	......	463,327
DECEMBER 8. By the S. S. *Socrates*, from Pará.						
Poel & Kelly	......	......	......	......	......	114,365
H. A. Astlett & Co.	8,000	......	......	12,500	......	20,500
Gaston, Williams & Wigmore	......	......	......	......	......	43,165
General Rubber Co.	......	......	......	......	......	56,070
F. R. Henderson & Co.	42,412	1,705	6,674	35,652	......	86,443
Various	......	......	......	......	......	230,065
DECEMBER 10. By the S. S. *Michael*, from Iquitos, Manáos and Pará.						
W. R. Grace & Co.	......	......	......	......	......	10,912
H. A. Astlett & Co.	109,000	......	30,000	17,500	......	156,500
Meyer & Brown, Inc.	80,626	......	12,059	109,983	......	246,400
G. Amsinck & Co, Inc.	......	......	......	......	......	80,800
Poel & Kelly	......	......	......	......	......	250,201
General Rubber Co.	......	......	......	......	......	11,560
Gaston, Williams & Wigmore	......	......	......	......	......	121,865
Neuss, Hesslein & Co.	......	......	......	......	......	71,596
F. R. Henderson & Co.	43,368	......	10,110	......	......	44,478
Paul Bertuch	......	......	24,889	......	......	24,889
Ultramares Corp.	......	......	......	......	......	38,100
Various	......	......	......	......	......	559,926
DECEMBER 12. By the S. S. *Ebro*, from Valparaiso and Mollendo.						
F. R. Henderson & Co.	33,600	......	22,400	......	......	56,000
DECEMBER 13. By the S. S. *Salto*, from Buenos Aires and Montevideo.						
P. D. Campbell & Co.	......	......	......	......	......	5,066

PLANTATIONS.

(Figured 180 pounds to the bale or case.)

	Shipment from:	Shipped to:	Pounds.	Totals.
NOVEMBER 24. By the S. S. *Edgemont*, at New York.				
Edward Maurer Co., Inc.	London	New York	162,360	
Adolph Hirsch & Co.	London	New York	17,100	
The Goodyear Tire & Rubber Co.	London	Akron	73,800	
Thornett & Fehr	London	New York	28,080	
Raw Products Co.	London	New York	49,320	330,660
NOVEMBER 24. By the S. S. *City of Hankow*, at New York.				
C. C. Trevanion & Co.	Colombo	Seattle	182,340	
L. Littlejohn & Co., Inc.	Colombo	New York	179,200	
Meyer & Brown, Inc.	Colombo	New York	145,600	
The Goodyear Tire & Rubber Co.	Colombo	Akron	180,000	
F. R. Henderson & Co.	Colombo	New York	40,680	
Poel & Kelly	Colombo	New York	184,770	
Aldens' Successors, Inc.	Colombo	New York	9,043	
Fred Stern & Co.	Colombo	New York	67,200	988,833
NOVEMBER 24. By the S. S. *Adriatic*, at New York.				
Various	Southampton	New York	10,080	10,080

	Shipment from:	Shipped to:	Pounds.	Totals.
NOVEMBER 24. By the S. S. *Eten*, at New York.				
L. Littlejohn & Co., Inc.	Liverpool	New York	67,200	
Thos. A. Desmond & Co.	Liverpool	New York	18,720	
Aldens' Successors, Inc.	Liverpool	New York	152,460	
Hood Rubber Co.	Liverpool	Watertown	45,720	
Various	Liverpool	New York	106,200	390,300
NOVEMBER 24. By the S. S. *Yeboshi Maru*, at New York.				
Thornett & Fehr	Colombo	New York	50,400	
Poel & Kelly	Colombo	New York	115,175	
L. Littlepohn & Co., Inc.	Colombo	New York	134,400	
Meyer & Brown, Inc.	Colombo	New York	140,000	
Various	Colombo	New York	13,380	453,355
NOVEMBER 25. By the S. S. *Seekonk*, at New York.				
L. Littlejohn & Co., Inc.	Colombo	New York	281,200	
Poel & Kelly	Colombo	New York	267,300	
United States Rubber Export Co.	Colombo	New York	43,200	
George S. Pettinos	Colombo	New York	18,000	
Chas. T. Wilson Co., Inc.	Colombo	New York	39,600	
Various	Colombo	New York	37,980	691,200
NOVEMBER 26. By the S. S. *Edward Luckenbach*, at New York.				
Meyer & Brown, Inc.	Rotterdam	New York	78,400	
Various	Rotterdam	New York	74,700	153,100
NOVEMBER 28. By the S. S. *Samland*, at New York.				
Aldens' Successors, Inc.	Antwerp	New York	59,569	
Poel & Kelly	Antwerp	New York	17,280	
Various	Antwerp	New York	38,531	115,380
DECEMBER 1. By the S. S. *Schiedyk*, at New York.				
L. Littlejohn & Co., Inc.	Soerabaya	New York	168,000	
Java, Holland-American Trading Co.	Samarang	New York	47,700	
Manhattan Rubber Manufacturing Co.	T'jong Priok	New York	64,440	
The Goodyear Tire & Rubber Co.	T'jong Priok	Akron	72,720	
Poel & Kelly	T'jong Priok	New York	165,780	
W. Hammesfahr & Co.	Telok Betong	New York	67,500	
Various	Soerabaya	New York	58,500	
Various	T'jong Priok	New York	120,180	
Various	Padang	New York	7,020	771,840
DECEMBER 1. By the S. S. *Heinan Maru*, at New York.				
L. Littlejohn & Co., Inc.	Colombo	New York	11,200	
Meyer & Brown, Inc.	Colombo	New York	236,320	
C. C. Trevanion & Co.	Colombo	Seattle	37,800	
Chas. T. Wilson Co., Inc.	Colombo	New York	44,640	
Fred Stern & Co.	Colombo	New York	78,400	
Various	Colombo	New York	215,440	623,800
DECEMBER 2. By the S. S. *Kangaroo*, at New York.				
Thornett & Fehr	Colombo	New York	44,820	
C. C. Trevanion & Co.	Colombo	Seattle	40,320	
Chas. T. Wilson Co., Inc.	Colombo	New York	46,260	
Meyer & Brown, Inc.	Colombo	New York	163,520	
L. Littlejohn & Co., Inc.	Colombo	New York	44,800	339,720
DECEMBER 2. By the S. S. *Maasdyk*, at New York.				
Meyer & Brown, Inc.	Rotterdam	New York	134,400	
Pablo Hermanos	Rotterdam	New York	43,560	
L. Littlejohn & Co., Inc.	Rotterdam	New York	44,800	
Aldens' Successors, Inc.	Rotterdam	New York	330,072	
F. R. Henderson & Co.	Rotterdam	New York	70,500	
Various			118,248	741,580
DECEMBER 2. By the S. S. *Valacia*, at New York.				
F. R. Henderson & Co.	Liverpool	New York	139,725	
Hood Rubber Co.	London	Watertown	84,578	
Meyer & Brown	Liverpool	New York	280,000	
Thornett & Fehr	Rotterdam	New York	3,420	
Paterson, Simmons & Co.	Liverpool	New York	97,740	
Aldens' Successors, Inc.	Liverpool	New York	913,602	
T. D. Downing & Co.	Liverpool	New York	36,360	
Poel & Kelly	Liverpool	New York	384,120	
L. Littlejohn & Co., Inc.	Liverpool	New York	828,800	
Various	Rotterdam	New York	160,740	
Various	Liverpool	New York	554,195	3,482,280
DECEMBER 3. By the S. S. *Jacques Cartier*, at New York.				
Poel & Kelly	Havre	New York	59,400	59,400
DECEMBER 3. By the S. S. *Tregenna*, at New York.				
Meyer & Brown, Inc.	Colombo	New York	100,800	
General Rubber Co.	Colombo	New York	97,200	198,000
DECEMBER 3. By the S. S. *Langdon Hall*, at New York.				
Poel & Kelley	....	New York	156,420	
Thomas J. Lipton, Inc.	....	New York	84,600	
L. Littlejohn & Co., Inc.	....	New York	383,200	
United States Rubber Co.	....	New York	1,260,000	
Various	....	New York	81,380	1,965,600
DECEMBER 5. By the S. S. *Rimouski*, at New York.				
Poel & Kelly	Liverpool	New York	694,800	
General Rubber Co.	Liverpool	New York	34,920	
The B. F. Goodrich Co.	Liverpool	Akron, Ohio	132,480	
Hood Rubber Co.	Liverpool	Watertown	32,220	
F. R. Henderson & Co.	Liverpool	New York	56,000	
Thornett & Fehr	Liverpool	New York	1,260	
Various	Liverpool	New York	270,180	1,221,860
DECEMBER 6. By the S. S. *Zuiderdyk*, at New York.				
Poel & Kelly	Rotterdam	New York	3,960	
Pablo Hermanos	Rotterdam	New York	2,880	
Meyer & Brown, Inc.	Rotterdam	New York	78,400	
Aldens' Successors, Inc.	Rotterdam	New York	8,861	
Various	Rotterdam	New York	72,900	167,001

	Shipment from	Shipped to	Pounds	Total
DECEMBER [illegible]. By the S. S. [illegible], at New York.				
W. R. Grace & Co.	Singapore	New York	[illegible]	28,980
DECEMBER 8. By the S. S. [illegible], at New York.				
Fred Stern & Co.	[illegible]	New York	[illegible]	
[illegible]	[illegible]	New York	120,140	
Peel & Kelly	[illegible]	New York	10,240	
The Goodyear Tire & Rubber Co.	[illegible]	Akron	63,000	
The Goodyear Tire & Rubber Co.	T'jong Priok	Akron	4,160	
L. Littlejohn & Co., Inc.	T'jong Priok	New York	114,500	
General Rubber Co.	T'jong Priok	New York	502,380	
J. T. Johnstone & Co., Inc.	T'jong Priok	New York	33,120	
Vernon Metal & Produce Co.	T'jong Priok	New York	12,060	
Edward Maurer Co., Inc.	T'jong Priok	New York	27,720	
Chas. T. Wilson, Inc.	T'jong Priok	New York	69,120	
The Fisk Rubber Co.	T'jong Priok	Chicopee Fls.	334,440	
Peninsular Trading Agency, Inc.	T'jong Priok	New York	30,600	
Aldens' Successors, Inc.	T'jong Priok	New York	27,000	
Catz American Co.	T'jong Priok	New York	70,740	
Rubber Trading Co.	T'jong Priok	New York	26,880	
Various	T'jong Priok	New York	316,260	2,225,900
DECEMBER 8. By the S. S. *Teenkai*, at New York.				
Fred Stern & Co.	Singapore	New York	492,800	
L. Littlejohn & Co., Inc.	Singapore	New York	896,000	
L. Littlejohn & Co., Inc.	Penang	New York	89,100	
William H. Stiles & Co.	Singapore	New York	254,160	
William H. Stiles & Co.	Penang	New York	69,300	
Poel & Kelly	Singapore	New York	325,440	
Poel & Kelly	Deli	New York	18,000	
The B. F. Goodrich Co.	Singapore	Akron	188,820	
The B. F. Goodrich Co.	Penang	Akron	71,460	
Chas. T. Wilson & Co., Inc.	Singapore	New York	56,880	
Hood Rubber Co.	Deli	Watertown	22,500	
The Goodyear Tire & Rubber Co.	Singapore	Akron	429,920	
The Goodyear Tire & Rubber Co.	Deli	Akron	52,200	
Rubber Importers' & Dealers' Co., Inc.	Singapore	New York	141,120	
Raw Products Co.	Singapore	New York	70,240	
J. T. Johnstone & Co., Inc.	Singapore	New York	58,720	
J. T. Johnstone & Co., Inc.	Deli	New York	54,180	
T. A. Desmond & Co.	Singapore	New York	141,120	
Smith & Schipper	Singapore	New York	50,400	
Adolf Hirsch & Co.	Singapore	New York	26,280	
W. G. Ryckman, Inc.	Penang	New York	29,700	
Gaston, Williams & Wigmore	Singapore	New York	37,440	
Aldens' Successors, Inc.	Singapore	New York	22,400	
Hadden & Co.	Singapore	New York	57,600	
Gove & French	Singapore	New York	80,100	
F. R. Henderson & Co., Inc.	Deli	New York	140,130	
Thornett & Fehr	Deli	New York	111,700	
Winter, Ross & Co.	Singapore	New York	50,800	
Meyer & Brown, Inc.	Singapore	New York	246,400	
Swinehart Tire & Rubber Co.	Deli	Akron	59,040	
Balfour, Williamson & Co.	Singapore	New York	76,080	
Boston Insulated Wire & Cable Co.	Singapore	Dorchester	1,800	
Various	Port Swet'n'm	New York	107,720	
Various	Penang	New York	19,800	
Various	Deli	New York	111,010	
Various	Singapore	New York	42,340	
Various	Zamboango	New York	16,740	4,719,440
DECEMBER 9. By the S. S. *Willaston*, at New York.				
Aldens' Successors, Inc.	London	New York	1,154,931	
Chas. T. Wilson & Co., Inc.	London	New York	1,597,860	
Poel & Kelly	London	New York	52,740	
The Goodyear Tire & Rubber Co.	London	Akron	19,800	
Thornett & Fehr	London	New York	119,700	
L. Littlejohn & Co., Inc.	London	New York	112,000	
F. R. Henderson & Co.	London	New York	128,000	
Various	London	New York	3,350,991	6,536,022
DECEMBER 10. By the S. S. *Noordam*, at New York.				
Meyer & Brown, Inc.	Rotterdam	New York	33,600	
Fred Stern & Co.	Rotterdam	New York	4,789	
Pablo Hermanos	Rotterdam	New York	85,680	
Various	Rotterdam	New York	178,709	302,778
DECEMBER 10. By the S. S. *West Wind*, at New York.				
J. T. Johnstone & Co., Inc.	Singapore	New York	162,500	
Aldens' Successors, Inc.	Singapore	New York	92,980	
W. R. Grace & Co.	Singapore	New York	10,080	
Fred Stern & Co.	Singapore	New York	212,800	
Edward Boustead & Co.	Penang	New York	97,920	
L. Littlejohn & Co., Inc.	Singapore	New York	1,379,520	
Aldens' Successors, Inc.	Penang	New York	106,560	
Balfour, Williamson & Co.	Singapore	New York	11,520	
Mitsui & Co., Limited	Singapore	New York	107,280	
Wilson, Holgate & Co.	Singapore	New York	32,400	
Chas. T. Wilson & Co., Inc.	Singapore	New York	215,640	

	Shipment from:	Shipped to:	Pounds.	Totals.
The Fisk Rubber Co.	Singapore	Chic'p'e Falls	210,780	
Hadden & Co.	Singapore	New York	52,560	
William H. Stiles & Co.	Singapore	New York	64,800	
F. R. Henderson & Co.	Singapore	New York	1,468,949	
Rubber Importers' & Dealers' Co., Inc.	Singapore	New York	522,720	
Bright & Galbraith	Penang	New York	23,040	
The Goodyear Tire & Rubber Co.	Singapore	Akron	453,420	
The Goodyear Tire & Rubber Co.	Penang	Akron	40,400	
Peel & Kelly	Penang	New York	45,540	
Pacific Trading Co.	Penang	New York	13,500	
Indo Malay Co.	Penang	New York	53,100	
T. A. Desmond & Co.	Singapore	New York	60,480	
W. G. Ryckman, Inc.	Singapore	New York	57,600	
Meyer & Brown, Inc.	Singapore	New York	336,000	
General Rubber Co.	Singapore	New York	478,800	
Rogers Pyatt Shellac Co.	Singapore	New York	96,480	
American Trading Co.	Singapore	New York	34,020	
Edward Maurer & Co., Inc.	Singapore	New York	342,540	
Robertson Co.	Singapore	New York	95,940	
Foreign Trade Banking Corp.	Singapore	New York	91,800	
Various	Singapore	New York	611,180	
Various	Penang	New York	302,109	7,884,958
DECEMBER 12. By the S. S. *Michigan*, at New York.				
Edward Maurer & Co., Inc.	London	New York	246,960	
Thornett & Fair	London	New York	478,260	
L. Littlejohn & Co., Inc.	London	New York	56,120	
H. P. Winter & Co.	London	New York	29,080	
Rubber Trading Co.	London	New York	58,240	868,660
DECEMBER 16. By the S. S. *Verentia*, at New York.				
Meyer & Brown, Inc.	Liverpool	New York	67,200	
T. D. Downing & Co.	Liverpool	New York	241,880	
Poel & Kelly	Liverpool	New York	864,900	
Rubber Trading Co.	Liverpool	New York	42,560	
L. Littlejohn & Co., Inc.	Liverpool	New York	11,200	
Various	....	....	64,080	1,291,820
DECEMBER 18. By the S. S. *City of Benares*, at New York.				
The Goodyear Tire & Rubber Co.	Rangoon	Akron	56,700	
Chas. T. Wilson & Co., Inc.	Rangoon	New York	21,960	
L. Littlejohn & Co., Inc.	Rangoon	New York	211,140	
General Rubber Co.	Rangoon	New York	226,080	
Rubber Trading Co.	Singapore	New York	22,400	
Meyer & Brown, Inc.	Colombo	New York	489,400	
Fred Stern & Co.	Colombo	New York	6,720	
Various	Rangoon	New York	259,880	1,294,280

BALATA.

DECEMBER 1. By the S. S. *Allianca*, at New York.				
Piza, Nephews & Co.	Cristobal	New York	240	240
DECEMBER 1. By the S. S. *Tivives*, at New York.				
G. Amsinck & Co., Inc.	Cristobal	New York	1,800	1,800
DECEMBER 1. By the S. S. *Levisa*, at New York.				
G. Amsinck & Co., Inc.	Cartagena	New York	1,560	1,560
DECEMBER 4. By the S. S. *Colon*, at New York.				
Ultramares Corp.	Cristobal	New York	2,100	
J. S. Sembrada & Co.	Cristobal	New York	3,450	
Hulbron, Wolf & Co.	Cristobal	New York	1,050	6,600
DECEMBER 5. By the S. S. *Rimouski*, at New York				
[1]R. & J. Dick, Limited.	Liverpool	Passaic	30,500	30,500

[1] Figured at 500 pounds to the bale.

DECEMBER 5. By the S. S. *Lake Gilboa*, at New York.				
G. Amsinck & Co., Inc.	Cartagena	New York	6,000	6,000
DECEMBER 6. By the S. S. *Gen. O. H. Ernst*, at New York.				
American Trading Co.	Cristobal	New York	5,100	
H. Marquardt & Co.	Cristobal	New York	10,050	
G. Amsinck & Co., Inc.	Cristobal	New York	3,750	18,900
DECEMBER 8. By the S. S. *Prins Frederick Hendrick*, at New York.				
Wm. Schall & Co.	Paramaribo	New York	8,700	
Arkell & Douglas, Inc.	Paramaribo	New York	12,000	20,700
DECEMBER 15. By the S. S. *Berenice*, at New York.				
Arkell & Douglas, Inc.	Paramaribo	New York	6,600	
William Schall & Co.	Paramaribo	New York	24,310	
Middleton & Co.	Demerara	New York	90,500	
J. P. Watson	Demerara	New York	20,000	
Various	Demerara	New York	22,000	163,410
DECEMBER 16. By the S. S. *Gen. W. C. Gorgas*, at New York.				
M. A. De Leon & Co.	Cristobal	New York	3,600	3,600

CENTRALS.

NOVEMBER 29. By the S. S. *Caracas*, at New York				
Scholtz & Co.	Venezuela	New York	8,300	
Yglesias & Co.	Venezuela	New York	700	9,000
DECEMBER 1. By the S. S. *Levisa*, at New York.				
Ultramares Corp.	Cartagena	New York	13,800	
G. Amsinck & Co., Inc.	Cartagena	New York	300	14,100

DECEMBER 4. By the S. S. *Colon*, at New York.

Hetilbron, Wolf & Co...	Cristobal	New York	1,000	
Ultramares Corp.	Cristobal	New York	4,000	
G. Amsinck & Co., Inc.	Cristobal	New York	7,200	
Pablo Calvet & Co......	Cristobal	New York	27,800	
Balfour, Williamson & Co.	Cristobal	New York	5,000	
J. S. Sembrada & Co....	Cristobal	New York	20,000	
Various	Cristobal	New York	1,100	66,100

DECEMBER 5. By the S. S. *Abangarez*, at New York.

R. del Castello..........	Cristobal	New York	1,100	1,100

DECEMBER 5. By the S. S. *Lake Gilboa*, at New York.

G. Amsinck & Co., Inc..	Cartagena	New York	100	100

DECEMBER 8. By the S. S. *San Jacinto*, at New York.

Border Rubber Co......	Havana	New York	8,100	8,100

DECEMBER 16. By the S. S. *Gen. W. C. Gorgas*, at New York.

G. Amsinck & Co., Inc..	Cristobal	New York	3,120	
William Schall & Co....	Cristobal	New York	3,240	
Colombo Overseas Corp..	Cristobal	New York	15,720	
Various	Cristobal	New York	120	22,200

MANICOBA.

DECEMBER 1. By the S. S. *Zingara*, at New York.

G. Amsinck & Co., Inc..	Para	New York	7,392	7,392

PONTIANAK.

DECEMBER 8. By the S. S. *Teenkai*, at New York.

Meyer & Brown, Inc...	Singapore	New York	120,600	
Kidder, Peabody & Co..	Singapore	Boston	12,000	132,600

DECEMBER 10. By the S. S. *West Wind*, at New York.

L. Littlejohn & Co., Inc.	Singapore	New York	231,300	
Fred. Stern & Co.......	Singapore	New York	65,700	
United Malaysian Co., Ltd.	Singapore	New York	345,300	
Otto Gross	Singapore	New York	1,200	643,500

AFRICANS.

NOVEMBER 23. By the S. S. *Eton*, at New York.

Various	Liverpool	New York	11,300	11,300

NOVEMBER 26. By the S. S. *Boutry*, at New York.

Niger Co., Ltd.........	Dakar	New York	690	
Alexander Roberts & Co.	Dakar	New York	44,000	44,690

DECEMBER 1. By the S. S. *Hatteras*.

Various	Marseilles	New York	8,645	8,645

DECEMBER 1. By the S. S. *Swazi*, at New York.

Henderson & Sons......	Hull	New York	1,955	1,955

DECEMBER 1. By the S. S. *Saint André*, at New York.

Huth & Co.............	Bordeaux	New York	385,480	
Fred. Stern & Co.......	Bordeaux	New York	27,127	
Rubber Trading Co.....	Bordeaux	New York	51,520	
Various	Bordeaux	New York	110,607	574,734

GUTTA PERCHA.

NOVEMBER 26. By the S. S. *Boutry*, at New York.

Niger Co., Ltd..........	Dakar	New York	9,300	9,300

GUTTA SIAK.

DECEMBER 8. By the S. S. *Teenkai*, at New York.

L. Littlejohn & Co, Inc.	Singapore	New York	8,400	8,400

DECEMBER 10. By the S. S. *West Wind*, at New York.

L. Littlejohn & Co, Inc.	Singapore	New York	127,500	127,500

GUTTAS.

DECEMBER 10. By the S. S. *West Wind*, at New York.

United Malaysian Co., Ltd.	Singapore	New York	84,000	84,000

CRUDE RUBBER ARRIVALS AT PACIFIC PORTS AS REPORTED.

PLANTATIONS.

(*Figured 180 pounds net to the bale or case.*)

	Shipment from:	Arrived at:	Shipped to:	Pounds.	Totals.
NOVEMBER 24. By the S. S. *Shinyo Maru*.					
Rubber Trading Co..	Singapore	San Fran.	New York	22,400	
F. R. Henderson & Co.	Singapore	San Fran.	New York	355,575	377,975
DECEMBER 3. By the S. S. *Protesilaus*.					
Fred. Stern & Co....	Singapore	Seattle	Seattle	281,000	
F. R. Henderson & Co.	Singapore	Seattle	New York	802,932	1,083,932
DECEMBER 5. By the S. S *West Sequana*.					
F. R. Henderson & Co.	Singapore	San Fran.	New York	80,500	
Rubber Trading Co..	Singapore	San Fran.	New York	33,600	114,100
DECEMBER 10. By the S S. *Empress of Japan*.					
E. Boustead & Co....	Penang	Vancouver	New York	72,900	72,900
DECEMBER 12. By the S. S. *Seiyo Maru*.					
F. R. Henderson & Co.	Singapore	San Fran.	New York	75,400	75,400
DECEMBER 12. By the S. S. *Wheatland Montana*.					
Fred. Stern & Co...	Kobe	Seattle	Seattle	22,400	22,400

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

October.

	1918.		1919.	
UNMANUFACTURED—free: India rubber:	Pounds.	Value.	Pounds.	Value.
From France	....	....	903,765	$277,812
Netherlands	....	....	424,224	202,338
Portugal	....	....	....	....
United Kingdom ..	5,606	$1,732	8,813,978	4,345,532
Canada	496,308	202,027	66,374	27,179
Central America ...	16.655	7,645	23,065	7,654
Mexico	269,884	107,913	8,216	2,417
Brazil	2,253,060	813,208	2,941,514	1,302,557
Peru	9,520	2.285	68,988	19,576
Other South America	66,007	25,630	247,132	91,643
British East Indies..	9,970,526	3,927.055	23,773,158	9,702,603
Dutch East Indies..	1,325,809	537,770	5,819,796	2,470,701
Other countries	808,336	311,201	636,165	279,639
Totals	15,221,711	$5,936,466	43,726,375	$18,729,651
Balata	99,718	$46,430	148,528	$84,588
Guayule	18,000	3,060	179,639	31,213
Jelutong (Pontianak)	21,272	1,906	2,530,053	381,577
Gutta-percha	506,336	94,093	769,115	127,322
Totals	645,326	$145,489	3,627,335	$624,700
Rubber scrap	520,784	28,767	1,235,953	82,903
Totals, unmanufactured.	16,387,821	$6,110,722	48,589,663	$19,437,254
Chicle (dutiable)	450,840	$266,556	960,482	$652,987
MANUFACTURED—*dutiable*:				
India rubber and gutta-percha	....	$24,462	....	$54,951
India rubber substitutes....	44,800	6,828	....	....

EXPORTS OF DOMESTIC MERCHANDISE.

MANUFACTURED—				
Automobile tires[1]	....	$930,204	....	$2,488,299
All other tires[1].............	....	29,661	....	147,373
Scrap and old..............	336,961	35,448	854,635	73,052
Reclaimed	238,325	41,130	607,472	105,831
Belting, hose and packing[1]..	....	404,223	....	400,553
Suspenders and garters.......	....	80,400	....	202,814
Boots[1] ....*pairs*	97,163	402,830	29,045	67,203
Shoes[1] ....*pairs*	254,427	218,802	587,953	490,094
Druggists' rubber sundries[1]..	....	52,492	....	117,373
Insulated wire and cables[1]..	....	525,031	....	487,444
Other rubber manufactures[1].	....	441,634	....	769,396
Totals, manufactured..	....	$3,161,855	....	$5,349,432
Fountain pens ......*number*	7,318	4,309	34,806	41,885

EXPORTS OF FOREIGN MERCHANDISE.

UNMANUFACTURED—				
India rubber	97,974	$41,086	637,640	$266,475
Balata	114,972	63,633	5,300	3,366
Guayule	....	....	4	1
Jelutong (Pontianak)	623	62	....	....
Gutta percha	....	....	2,450	1,432
Rubber scrap	....	....	548	14
Totals, unmanufactured	213,569	$104,781	645,942	$271,288
MANUFACTURED—				
India rubber	....	....	....	....
Gutta percha	....	$6,428	....	$19,842
Totals, manufactured..	....	$6,428	....	$19,842
Chicle	....	....	2,277	$1,480

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

MANUFACTURED—				
To Alaska:				
Belting, hose and packing	....	$11,417	....	$5,334
Boots and shoes... *pairs*	7,064	14,360	5,297	77,788
Other rubber goods....	....	3,305	....	5,714
Totals	....	$29,082	....	$22,846
To Hawaii:				
Belting, hose and packing	....	$4,340	....	$5,324
Automobile tires	....	79,842	....	29,235
Other tires	....	319	....	....
Other rubber goods...............		11,481	....	5,502
Totals	....	$95,982	....	$40,061
To Porto Rico:				
Belting, hose and packing	....	$10,443	....	$7,481
Automobile tires	....	222,173	....	77,236
Other tires	....	3,581	....	13,130
Other rubber goods.....	....	13,321	....	23,562
Totals	....	$249,518	....	$121,409
To Philippine Islands:				
Belting, hose and packing	....	$6,073	....	$9,103
Boots and shoes....*pairs*	59,432	46,803	14,997	15,693
Tires	....	126,451	....	44,125
Other rubber goods....	....	24,124	....	9,625
Totals	....	$203,453	....	$78,546

[1] Details of exports of domestic merchandise by countries during October are given on page 262 of this issue.

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES, DURING THE MONTH OF OCTOBER, 1919.

Exported to—	Belting, Hose and Packing	Boots		Shoes		Druggists' Rubber Sundries	Tires.		Insulated Wire and Cables	All Other Manufactures of Rubber.	Totals
							Automobiles	All Others			
EUROPE:	Value.	Pairs.	Value.	Pairs.	Value.	Value.	Value.	Value.	Value.	Value.	Value.
Austria-Hungary	$5,700						$23,929	$94	$4,016		$33,739
Belgium	550			14,231	8,684	$109	89,907	35,457	4,443	$24,821	163,971
Denmark	6,792	6,468	$12,097	54,324	42,434	3,596	239,096	6,003	3,050	11,048	324,116
Finland				3,480	3,033	300			1,729		5,062
France	1,446			10,031	8,460	7,574	58,362		1,000	80,229	157,071
Germany				1,000						11,465	12,465
Gibraltar										130	130
Greece							2,191				2,191
Iceland and Faroe Islands		1,984	4,662	6,170	3,220		3,309		4,709	636	16,536
Italy	26			8,604	11,304	73	67,400		358	5,974	85,135
Netherlands	10,086			3,744	3,472	432	202,310	20,939	5,621	10,412	253,272
Norway	11,106	48	62	171,056	127,013	1,909	113,182	7,658	67,439	20,472	348,841
Portugal	6,043			1,657	1,604	469	24,918	335	4,041	1,101	38,511
Russia in Europe				38	75					12	87
Spain	3,807			8,236	4,311	2,883	108,494	3,500	2,090	4,323	129,408
Sweden	10,714			6,000	6,000	2,864	273,315	9,759	16,728	28,238	347,618
Switzerland	5,925			27,252	12,229	2,559	89,221	620	162	9,132	119,848
Turkey in Europe				192	200		3,720	1,175			5,095
England	39,828	2,172	3,312	99,125	69,521	21,821	18,998	182	20,703	124,339	298,704
Scotland	7,637					524			300	383	8,844
Ireland						30,061				76	30,137
TOTALS, EUROPE	$109,660	10,672	$20,133	415,140	$302,560	$75,174	$1,318,352	$85,722	$136,389	$332,791	$2,380,781
NORTH AMERICA.											
Bermuda	$130			12	$43	$1,017		135	9	$145	$1,479
British Honduras	31			268	254	194	277	5	8		769
Canada	44,314	5,426	$18,512	8,029	11,771	11	45,399	4,553	19,280	161,820	305,660
Costa Rica	1,593						480	152	396	447	3,068
Guatemala	4,717			120	91		18,885	253	2,799	414	27,159
Honduras	794						1,261	68	112	388	2,623
Nicaragua	970			573	822		2,426			4,604	8,822
Panama	5,592	18	59	645	1,267	501	26,118	540	1,877	7,457	44,411
Salvador	479					82	2,448		250	4,941	8,200
Mexico	56,048	24	149	2,651	2,163	3,809	59,754	3,049	29,048	18,425	172,445
Miquelon, Langley, etc.		113	295							242	537
Newfoundland and Labrador	2,097	4,520	14,608	5,582	6,403	273	1,172		608	4,514	29,675
Barbados	284					1	588			116	989
Jamaica	816			5,807	9,409	57	12,690	91	13	375	23,451
Trinidad and Tobago	650			1,440	1,010	116	11,331		159	632	13,898
Other British West Indies	155			548	420	36	4,251	207		460	5,529
Cuba	55,642	43	208	9,103	8,596	5,998	277,037	13,113	37,331	44,873	441,798
Danish West Indies	177			1	1	21	1,542			302	2,043
Dutch West Indies	193			346	357	31	63	35		167	846
French West Indies	273	2	17	156	177		14,205		85	290	15,047
Haiti	200						2,466		233	322	3,221
Dominican Republic	471					75	2,666	390	563	700	4,865
TOTALS, NORTH AMERICA	$175,626	10,146	$33,848	35,281	$42,784	$12,222	$485,059	$22,591	$92,771	$251,634	$1,116,535
SOUTH AMERICA:											
Argentina	$7,765			12,456	$11,352	$4,840	$156,635	$2,576	$24,365	$24,593	$232,126
Bolivia	343					494	830		2,120	172	3,959
Brazil	13,558	54	193	8,554	7,045	3,189	61,954	494	93,669	53,481	233,583
Chile	6,480			132	152	5,161	33,443	784	13,342	9,694	69,056
Colombia	4,352	1	4	102	63	1,044	12,417	155	1,180	1,146	20,361
Ecuador				96	100	391	4,216		90	916	5,703
British Guiana	394			590	531		425			271	1,621
Peru	14,707			100	185	2,660	9,374		29,078	3,615	59,619
Uruguay	3,677					616	51,787		1,557	7,846	65,483
Venezuela	2,314					2,254	9,584	545	1,669	1,086	17,452
TOTALS, SOUTH AMERICA	$53,590	55	$197	22,030	$19,428	$20,649	$340,665	$4,554	$167,060	$102,820	$708,963
ASIA:											
Aden							$203				$203
China	1,571	1	3	10,558	11,187	1,512	17,920	29	61,625	2,861	96,708
Japanese China				288	894					200	1,094
Chosen							2,144			18	2,162
British India	3,576					1,270	33,799	13,247	2,065	3,741	57,698
Straits Settlements	229			528	428		33,654			815	35,126
Other British East Indies	250										250
Dutch East Indies	1,225					647	70,614	15,314	5,158	4,403	97,361
French East Indies								35			35
Hongkong		24	80	970	1,046	227	2,075	487		614	4,529
Japan	10,637	5,876	7,072	56,255	57,220		11,783	868	3,744	35,122	126,446
Russia in Asia	264			27,192	36,519	1,160	646		46	756	39,391
Siam				3	3						3
Turkey in Asia				1,651	1,001						1,001
TOTALS, ASIA	$17,752	5,901	$7,155	97,445	$108,298	$4,816	$172,838	$29,980	$72,638	$48,530	$462,007
OCEANIA:											
Australia	$5,771	120	$249	2,280	$1,137	$2,321	$24,844		$3,026	$3,049	$40,397
New Zealand	762	1,188	4,112			777	50,912		3,516	9,846	69,925
Other British Oceania							1,012			28	1,040
French Oceania	67						1,179	328	252	25	1,851
German Oceania		8	15				791	26		88	920
Philippine Islands	9,103	204	445	14,793	15,248	392	40,914	3,211	10,868	9,233	89,414
TOTALS, OCEANIA	$15,703	1,520	$4,821	17,073	$16,385	$3,490	$119,652	$3,565	$17,662	$22,269	$203,547
AFRICA:											
British West Africa		1	6	1	$1	$20	$1,355				$1,382
British South Africa	19,394	750	1,043	981	631	982	44,538	790	924	8,402	76,704
Canary Islands							3,073				3,073
French Africa							1,578			10	1,588
Liberia				2	7		13				20
Morocco							225				225
Portuguese Africa	8,828							171		3	9,002
Egypt						20	951			2,937	3,908
TOTALS, AFRICA	$28,222	751	$1,049	984	$639	$1,022	$51,733	$961	924	$11,352	$95,902
TOTALS	$400,553	29,045	$67,203	587,953	$490,094	$117,373	$2,488,299	$147,373	$487,444	$769,396	$4,967,735

SHIPMENTS TO NON-CONTIGUOUS TERRITORY.

Exported to	Belting Hose and Packing.	Boots and Shoes. Pairs.	Boots and Shoes. Value.	Druggists' Rubber Sundries. Value.	Tires. Automobiles. Value.	Tires. All Others. Value.	Insulated Wire and Cables. Value.	All Other Manufactures of Rubber. Value.	Totals Value.
Hawaii	$5,324	1,340	$1,771	......	$29,235	......	......	$5,502	$41,832
Porto Rico	7,481	2,562	2,807	......	77,236	13,130	......	23,562	124,216
TOTALS	$12,805	3,902	$4,578	......	$106,471	$13,130	......	$29,061	$166,048

(Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.)

RUBBER STATISTICS FOR ITALY.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

Six Months Ended June 30.

UNMANUFACTURED—	1918. Quintals.[1]	1918. Lire.[2]	1919. Quintals.	1919. Lire.
India rubber and gutta percha—raw and reclaimed:				
From Great Britain	4,279		......	
India and Ceylon	2,401		18,101	
Straits Settlements	15,727		24,948	
French African Colonies	3,422	37,182,600	2,487	67,274,550
Belgian Congo	61		574	
Brazil	8,248		10,048	
Other countries	1,273		1,013	
Rubber scrap	560	100,800	8,584	1,545,120
Totals, unmanufactured	......	37,283,400	......	68,819,670
MANUFACTURED—				
India rubber and gutta percha—				
Threads	218	566,800	152	395,200
Sheets, including hard rubber	62	100,100	98	161,600
Tubes:				
Inner tubes	4	10,400	2	5,200
Hose	69	89,700	67	87,100
Other forms	1	1,200	19	22,800
Belting	358	501,200	254	355,600
Rubber-coated fabrics—*pieces:*				
For carding combs	96	153,600	284	454,400
Other forms	3	4,500	59	88,500
Boots and shoes—*pairs*	18,056	270,840	12,980	194,700
Elastic webbing	111	310,800	247	691,600
Clothing and articles for travel.	14	44,800	2	6,400
Manufactures of india rubber and gutta percha, n. e. s.:				
From cut sheets	19	53,200	19	53,200
Elastic fabrics	849	1,443,300	2,080	3,536,000
Tires and tubes:				
From France	1,448		2,729	
Great Britain	410	4,459,200	461	7,663,200
Other countries	......		3	
Other rubber manufactures:				
From France	1,286		90	
Great Britain	1,015	3,943,500	7,799	11,866,500
United States	126		22	
Other countries	2		......	
Totals, manufactured	......	11,653,140	......	25,582,000
Total imports	......	48,936,540	......	94,401,670

EXPORTS OF CRUDE AND MANUFACTURED RUBBER.

Six Months Ended June 30.

UNMANUFACTURED	1918. Quintals.[1]	1918. Lire.[2]	1919. Quintals.	1919. Lire.
India rubber and gutta percha—raw and reclaimed:				
To Spain	585	280,000	1,922	1,316,800
United States	115		1,370	
Rubber scrap	......	......	100	12,000
Totals, unmanufactured	......	280,000	......	1,328,800
MANUFACTURED—				
India rubber and gutta percha—				
Threads	18	48,600	180	486,000
Sheets:				
Cut sheets	7	16,800	25	60,000
Elastic fabric	21	25,200	10	12,000
Other kinds, including hard rubber	20	30,000	14	21,000
Tubes:				
Inner tubes	3	7,800	38	98,800
Hose	86	103,200	283	339,600
Other forms	64	70,400	166	182,600
Belting	36	57,600	95	152,000
Rubber-coated fabrics—*pieces*	38	45,600	98	117,600
Elastic webbing	481	1,443,000	363	1,089,000
Clothing and articles for travel	3	14,400	4	19,200
Manufactures of india rubber and gutta percha, n. e. s.:				
From cut sheets	45	117,000	50	130,000
Elastic fabrics	64	102,400	99	158,400
Tires and tubes:				
To France	370		225	
Great Britain	1,098		1,664	
Spain	81		261	
Switzerland	......		13	
British Indies and Ceylon	......	5,076,800	545	11,534,900
Dutch East Indies	441		......	
Straits Settlements	......		140	
Australia			242	
Brazil	434		462	
Other countries	244		1,904	

Six Months Ended June 30.

MANUFACTURED	1918. Quintals.[1]	1918. Lire.[2]	1919. Quintals.	1919. Lire.
Other rubber manufactures:				
To France	91		166	
Great Britain	87		84	
Spain	7		8	
Switzerland	109		52	
Egypt	21	599,200	28	1,107,400
Argentina	31		95	
Brazil	17		20	
Uruguay	8		7	
Other countries	56		331	
Totals, manufactured	......	7,758,000	......	15,508,500
Total exports	......	8,038,000	......	16,837,300

[1]One quintal equals 220.46 pounds.
[2]One lira equals $0.193.

UNITED KINGDOM RUBBER STATISTICS.

IMPORTS.

October.

UNMANUFACTURED	1918. Pounds.	1918. Value.	1919. Pounds.	1919. Value.
Crude rubber				
From—				
Dutch East Indies	200,000	£24,181	1,824,100	£186,612
French West Africa	......	......	......	......
Gold Coast	......	......	9,400	607
Other African countries	368,800	36,565	141,900	12,008
Peru	......	......	111,400	11,040
Brazil	76,600	10,398	437,500	44,823
British India	35,800	4,189	253,100	25,178
Straits Settlements and dependencies, including Labuan	774,400	81,958	7,831,900	809,345
Federated Malay States	425,600	50,288	9,999,400	1,009,367
Ceylon dependencies	2,296,700	264,211	1,537,000	160,225
Other countries	104,200	10,691	762,300	75,745
Totals	4,282,200	£482,581	22,908,000	£2,334,950
Waste and reclaimed rubber.	3,600	32	680,400	21,271
Totals, unmanufactured.	4,285,800	£482,613	23,597,400	£2,356,221
Gutta percha	997,600	186,189	1,442,300	290,895
MANUFACTURED—				
Boots and shoes..*dozen pairs*	1,480	£6,690	20,805	£33,731
Waterproofed clothing	......	......	......	3,506
Automobile tires and tubes	......	70,530	......	199,119
Motorcycle tires and tubes	......	16	......	145
Carriage tires and tubes	......	......	......	......
Bicycle tires and tubes	......	......	......	9,032
Insulated wire	......	1,538	......	381
Submarine cables	......	......	......	38
Totals	......	£78,774	......	£245,952

EXPORTS.

UNMANUFACTURED	1918. Pounds.	1918. Value.	1919. Pounds.	1919. Value.
Waste and reclaimed rubber.	249,200	£6,917	1,120,900	£26,401
MANUFACTURED				
Waterproofed clothing	......	36,968	......	189,365
Boots and shoes..*dozen pairs*	5,945	9,218	14,981	32,736
Insulated wire	......	5,473	......	81,709
Submarine cables	......	2,146	......	46,292
Carriage tires and tubes	......	15,228	......	24,027
Automobile tires and tubes	......	137,525	......	164,794
Motorcycle tires and tubes	......	10,291	......	17,309
Other rubber manufactures	......	117,723	......	228,289
Totals	......	£363,961	......	£905,060

EXPORTS—COLONIAL AND FOREIGN.

UNMANUFACTURED	1918. Pounds.	1918. Value.	1919. Pounds.	1919. Value.
Crude rubber:				
To Belgium	......	......	498,400	£48,141
France	1,940,400	£226,706	1,638,900	175,095
Italy	401,700	36,024	214,800	23,652
United States	......	......	16,131,200	1,687,931
Other countries	179,600	27,117	3,513,500	361,285
Totals	2,521,700	£289,847	22,046,800	£2,296,104
Waste and reclaimed rubber.	......	......	14,000	700
Totals, unmanufactured	2,521,700	£289,847	22,060,800	£2,296,804
Gutta percha	2,100	£428	61,300	£11,759

UNITED KINGDOM RUBBER STATISTICS—(Continued)

	October			
	1918.		1919.	
	Pounds.	Value.	Pounds.	Value.
Manufactures—			[illegible]	449
Boots and shoes [illegible]				5
Waterproof clothing	....	...	...	975
Insulated wire	...		...	8,372
Automobile tires and tubes	....	10	....	
Motorcycle tires and tubes	....	6	....	234
Bicycle tires and tubes	....	....	....	....
Carriage tires and tubes	....	....	....	....
Totals	....	[illegible]	....	£10,035

RUBBER STATISTICS FOR THE DOMINION OF CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	September.			
	1918.		1919.	
Unmanufactured—*free:*	Pounds.	Value.	Pounds.	Value.
Rubber, gutta percha, etc.:				
From United Kingdom	130,136	$53,538	850,491	$374,266
United States	142,456	59,453	468,858	194,954
British East Indies:				
Ceylon	112,050	47,561	30,651	17,098
India	19,860	8,692	....	....
Straits Settlements	1,860,969	683,996	609,540	264,217
Other countries	22,879	7,693	....	....
Totals	2,288,850	$860,927	1,959,540	$850,535
Rubber, recovered	194,777	$32,898	180,642	$28,902
Hard rubber sheets and rods	2,647	1,828	5,977	4,493
Hard rubber tubes	....	826	....	3,211
Rubber, powdered, and rubber or gutta percha scrap	93,362	6,079	220,572	16,498
Rubber thread, not covered	1,846	2,674	3,469	5,080
Rubber substitute	62,882	10,118	53,260	9,255
Totals	355,514	$54,514	466,920	$67,439
Chicle	49,507	30,469	118,334	93,790
Manufactured—*dutiable:*				
Boots and shoes	....	$32,562	....	$40,106
Waterproofed clothing	....	7,473	....	14,629
Belting, hose, packing, and matting	....	32,514	....	24,194
Gloves and hot-water bottles	....	(*)	....	5,962
Tires	....	65,288	....	128,485
Other manufactures	....	106,817	....	167,308
Totals	....	$244,654	....	$380,684

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	September			
	1918.		1919.	
	Produce of Canada. Value.	Reexports of Foreign Goods. Value.	Produce of Canada. Value.	Reexports of Foreign Goods. Value.
Unmanufactured—				
Crude and waste rubber	....	....	$52,653	$11,062
Manufactured—				
Hose	$24,081	....	17,983	....
Boots and shoes	155,123	....	175,633	593
Clothing	3,259	....	2,413	13
Belting	110	....	14,016	....
Tires	93,590	$1,402	456,834	1,486
All other, n. o. p.	9,614	338	17,549	1,113
Totals	$285,777	$1,740	$737,081	$14,267
Chicle	....	....	$1,941	....

* Included in "Other manufactures."

THE MARKET FOR RUBBER SCRAP.

NEW YORK.

The rubber scrap market continues inactive. There is only moderate demand for stock on the part of the reclaiming industry and a marked tendency to hold off in purchases until after the usual inventory period is passed.

The prices for shoes are steady without movement of the goods.

The same is true of automobile tires, which are sought actively only on the part of tire rebuilding concerns and those preparing pulled fabric for manufacturers of tire reliners, tire boots and tire repair men for patching purposes.

Dealers view with some concern the London prediction that the output of crude rubber for 1920 will be much increased over that of the past year, in anticipation that such a condition will influence unfavorably the demand for reclaim and consequently for scrap.

QUOTATIONS FOR CARLOAD LOTS DELIVERED.

December 29, 1919

Prices subject to change without notice.

BOOTS AND SHOES:			
Arctic tops	lb.	$0.01 @	
Boots and shoes	lb.	.08⅜ @	.08½
Trimmed arctics	lb.	.06½ @	.06⅝
Untrimmed arctics	lb.	.05⅝ @	
HARD RUBBER:			
Battery jars, black compound	lb.	.01 @	
No. 1, bright fracture	lb.	.23 @	.24
INNER TUBES:			
No. 1, old packing	lb.	.18½ @	.19¼
No. 2	lb.	.10 @	.10¼
Red	lb.	.09½ @	.09¾
MECHANICALS:			
Black scrap, mixed, No. 1	lb.	.03½ @	.04
No. 2	lb.	.03 @	
Car springs	lb.	.03½ @	.04
Heels	lb.	.03 @	.03½
Horse-shoe pads	lb.	.03 @	.03½
Hose, air brake	lb.	.04¼ @	
fire, cotton lined	lb.	.01½ @	.01¾
garden	lb.	.01½ @	.01¾
Insulated wire stripping, free from fiber	lb.	.03½ @	.04
Matting	lb.	.01¼ @	.01½
Red packing	lb.	.05½ @	.06
Red scrap, No. 1	lb.	.09 @	.10
No. 2	lb.	.06¾ @	.07¼
White scrap No. 2	lb.	.08 @	.09
No. 1	lb.	.10 @	.11
TIRES:			
PNEUMATIC—			
Auto peelings, No. 1	lb.	.06¾ @	.07¼
No. 2	lb.	.04¾ @	.05¼
Bicycle	lb.	.02¾ @	.03
Standard white auto	lb.	.03½ @	.03⅝
Standard mixed auto	lb.	.03¾ @	
Stripped, unguaranteed	lb.	.02¾ @	
White, G. & G., M. & W., and U. S.	lb.	.04¾ @	.05
SOLID—			
Carriage	lb.	.04 @	.04¼
Irony	lb.	.01 @	
Truck	lb.	.03½ @	.03¾

THE MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

American Cotton. On December 1, the spot price for middling uplands cotton stood at 39.45 cents; it fluctuated above that price for a week or so, reaching 40.25 cents, the high mark for the month, then dropped to 38 cents, where it stayed for a few days. December 17 saw it rise again to 39.25, a price which was maintained for fully two weeks to the end of the year, without change and with a daily record of "no sales."

Egyptian Cotton. The market dropped sharply from the high prices reached at the beginning of November and is now quiet but strong. No upper Egyptian is left and low-grade Sakellarides is also scarce so that purchases of Egyptian, practically, will be limited to medium and high-grade Sakellarides, which are quoted at 85 to 90 cents.

American-Egyptian Cotton. Arizona cotton also dropped in sympathy with Egyptian. Early frosts followed by rain stopped growth so that the cotton was coming in ranks only as choice. The crop estimate is much reduced and 40,000 bales may be too high. Arizona-Egyptian is quoted at 80 to 85 cents.

Sea Island Cotton. The situation is unchanged. Very little high-grade exists, buying though steady is slow and the price quoted for average extra choice is 84 cents.

Tire Fabrics. The manufacturers of tire fabrics are working hard to meet the demands of the customers with whom they have made contracts. It is useless to quote prices because fabrics are not to be had save possibly for an occasional small lot.

Ducks and Drills. Owing to the continued labor troubles, there is a scarcity of supply which cannot be remedied, however keen the demand, until the mill hands settle down to working full time again. The inactivity of the mills has checked the need for some lines of goods, such as belting duck, and dealers are awaiting the return of normal conditions.

NEW YORK QUOTATIONS.

December 29, 1919

Prices subject to change without notice

ASBESTOS CLOTH:				
Brake lining, 2½ lbs. sq. yd., brass or copper insertion	*lb.*	$1.00	@	1.10
2¼ lbs. sq. yd., brass or copper insertion	*lb.*	1.10	@	1.15
BURLAPS:				
32—7 ounce	*100 yards*	11.00	@	
32—8 ounce		11.75	@	
40—7½-ounce		12.15	@	
40—8 ounce		[illegible]	@	
40—10-ounce		17.00	@	
40—10½-ounce		[illegible]	@	
45—7½-ounce		[illegible]	@	
45—8-ounce		[illegible]	@	
DRILLS:				
38-inch 2.00-yard	*yard*	.42½	@	
40-inch 2.47-yard		.34½	@	
52-inch 1.90-yard		.60½	@	
52-inch 1.95-yard		.59	@	
60-inch 1.52-yard		.85⅝	@	
DUCK:				
CARRIAGE CLOTH:				
38-inch 2.00-yard enameling duck	*yard*	.43½	@	
38-inch 1.74-yard		.49½	@	
72-inch 16.66-ounce		1.14½	@	
72-inch 17.21-ounce		1.18¾	@	
MECHANICAL:				
Hose	*pound*	.70	@	
Belting		.72	@	
HOLLANDS, 40-INCH:				
Acme	*yard* *	.30	@	
Endurance	*	.38	@	
Penn	*	.46	@	

OSNABURGS:				
40-inch 2.35-yard	*yard*	[illegible]	@	
40-inch 2.48-yard		[illegible]	@	
37½-inch 2.42-yard		[illegible]	@	
RAINCOAT FABRICS:				
COTTON:				
Bombazine 64 x 60 water-repellent	*yard*	[illegible]	@	
60 x 48 not water-repellent		[illegible]	@	
Cashmeres, cotton and wool, 36-inch, tan		1.10	@	
Twills 64 x 72		[illegible]	@	
64 x 102		.48	@	
Twill, mercerized, 36-inch, blue and black		[illegible]	@	
tan and olive		[illegible]	@	
Tweed		[illegible]	@	1.00
printed		.27½	@	
Plaids 60 x 48		[illegible]	@	
56 x 44		[illegible]	@	
Repp		[illegible]	@	[illegible]
Surface prints 60 x 48		[illegible]	@	
64 x 60		[illegible]	@	
IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING—PLAIN AND FANCIES:				
63-inch, 3¼ to 7½ ounces	*yard*	[illegible]	@	3.75
36-inch, 2¾ to 5 ounces		.75	@	2.15
IMPORTED PLAID LINING (UNION AND COTTON):				
63-inch, 2 to 4 ounces	*yard*	.95	@	1.90
36-inch, 2 to 4 ounces		.60	@	1.15
DOMESTIC WORSTED FABRICS:				
36-inch, 4½ to 8 ounces	*yard*	.75	@	1.75
DOMESTIC WOVEN PLAID LININGS (COTTON):				
36-inch, 3¾ to 5 ounces		[illegible]	@	.35
SHEETINGS:				
48 x 48-inch, 2.35-yard	*yard*	.34	@	
48 x 48-inch, 2.50-yard		.32	@	
48 x 48-inch, 2.70-yard		.30	@	
48 x 48-inch, 2.85-yard		.28½	@	
64 x 68-inch, 3.15-yard		.32¼	@	
56 x 60-inch, 3.60-yard		.27	@	
JACKET:				
Delaware	*yard* *	.30	@	
Schuykill	*yard* *	.37	@	
SILKS:				
Canton, 38-inch	*yard*	.72½	@	
Schappe, 36-inch		1.00	@	
TIRE FABRICS:				
BUILDING:				
17¼-ounce Sea Island, combed	*pound*	[illegible]	@	
17¼-ounce Egyptian, combed		2.00	@	
17¼-ounce Egyptian, carded		1.80	@	
17¼-ounce, Peelers, combed		2.25	@	
17¼-ounce Peelers, carded		1.30	@	
CHAFER:				
9¼-ounce Sea Island		2.75	@	
9¼-ounce Egyptian, carded		2.25	@	
9¼-ounce peeler, carded		1.40	@	

*Nominal.

ANNUAL STATEMENT OF THE EGYPTIAN COTTON CROP.

	Season. 1918-1919.	1917-1918.	1916-1917
Total receipts (interior gross weight), cantars[1]	4,826,342	6,315,841	5,126,199
EXPORTS.			
To Liverpool *bales*	254,509	225,253	211,618
Manchester	148,415	120,715	134,358
Other United Kingdom ports	6,019	147,327	......
Total shipments to Great Britain	408,943	493,295	345,976
To France	56,250	32,566	29,302
Spain	16,305	9,571	11,391
Italy	44,233	40,693	33,493
Switzerland	22,423	8,917	[illegible]
Russia	......	......	[illegible]
Greece	4,513	2,862	[illegible]
Total shipments to Continent	143,724	94,609	128,000
To United States	78,454	76,640	135,685
India	......	......	100
Japan	24,017	20,617	14,378
Total to all parts	655,138	685,161	624,139
Equal to cantars (interior gross weight)	4,948,544	5,235,935	4,765,549

SUPPLY, EXPORTS AND STOCK.

		Season 1918-1919	1917-1918	1916-1917
Stock beginning of season ....cantars		1,423,000	405,000	109,000
Total crop		4,826,342	6,315,841	5,126,199
Total supply		6,249,342	6,720,841	5,235,199
Exported	4,948,544			
Local consumption	56,758			
Burnt	1,040			
		5,006,342	5,297,841	4,830,199
Leaving stock in Alexandria end of season		1,243,000	1,423,000	405,000

Average net weight of Bales exported.	Bales.	Average Cantars.	Bales.	Average Cantars.	Bales.	Average Cantars.
To Great Britain.......	408,943	....	493,295	7.676	345,976	7.642
United States.......	78,454	....	76,640	7.624	135,685	7.669
Continent and Japan	167,741	....	115,226	7.507	142,478	7.588
Average of total exports	655,138	7.554	685,161	7.642	624,139	7,635

TOTAL CROPS (Interior gross weight).

Season.	Area in Feddans.	Cantars.	Yield in Cantars per Feddan.
1898-99	1,121,261	5,589,314	4.98
1899-1900	1,153,306	6,510,050	5.64
1900-01	1,230,320	5,427,338	4.41
1901-02	1,249,884	6,371,643	5.09
1902-03	1,275,680	5,838,090	4.57
1903-04	1,332,510	6,508,947	4.88
1904-05	1,436,708	6,351,879	4.42
1905-06	1,566,601	5,959,883	3.80
1906-07	1,506,290	6,949,783	4.61
1907-08	1,603,224	7,234,669	4.51
1908-09	1,640,415	6,755,812	4.12
1909-10	1,466,530	4,986,715	3.40
1910-11	1,603,226	7,573,537	4.72
1911-12	1,711,227	7,424,208	4.34
1912-13	1,721,797	7,532,920	4.38
1913-14	1,723,094	7,684,172	4.46
1914-15	1,755,270	6,463,726	3.68
1915-16	1,186,004	4,726,518	3.99
1916-17	1,655,512	5,126,199	3.10
1917-18	1,677,308	6,315,841	3.77
1918-19	1,315,572	4,826,342	3.67

The figures of the area sown are supplied by the Egyptian Ministry of Finance.

ACREAGE PLANTED TO VARIOUS VARIETIES OF EGYPTIAN COTTON.

	Season. 1919.	1918.	1917.
Afifi Assil ....feddans	21,003	20,736	38,008
Mit Afifi	35,145	36,242	96,674
Abbassi	3,718	4,869	3,489
Jannovitz	97	223	1,592
Ashmouni	334,160	273,936	361,875
Nubari	23,611	21,587	39,337
Sakellarides	1,146,443	952,480	1,133,180
Various	9,485	5,499	3,153
Totals ....feddans	1,573,662	1,315,572	1,677,308

One cantar equals 98 pounds.
One feddan equals 1.1 acres.
(*Compiled by Davies, Benachi & Co.*)

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

NEW YORK.

THERE IS GENERALLY a short supply of all leading rubber compounding ingredients. The market is firm and there appears to be no prospect of lower prices after the first of the year. Everything, on the contrary, tends to higher manufacturing costs. In some directions there is curtailment of production and limited supplies regardless of prices.

ANILINE OIL. There is no spot stock and prices have advanced.

BARYTES. Prices are very firm because of the inability to get stocks forward and the danger of the short coal supply as well as the continued lack of labor.

BENZOL. The demand is very active with 34 cents the price for spot goods.

LITHARGE. The price has advanced a cent during the past month, but the demand continues to far exceed the producing capacity of the makers.

LITHOPONE. Contracts for the early months of 1920 have been placed at 7 to 7½ cents. Prices are exceedingly firm.

LIME. Makers report that they are several hundred tons behind in production and have found it necessary to discard certain productions of lime in order to take care of the heavy orders on the more essential grades.

SUBLIMED LEAD. In spite of the heavy and increasing demand prices have not been advanced.

SULPHUR. The market is firm and steady and prices reasonable.

WHITING. Owing to the difficulties of securing adequate supplies of English chalk the situation was relieved somewhat during December by arrival of chalk from Danish sources. Supplies are still short owing to slow arrivals of material.

NEW YORK QUOTATIONS.

DECEMBER 29, 1919.

Prices subject to change without notice.

ACCELERATORS, ORGANIC.				
Accelerator, N. C. C.	lb.	$0.50	@	
Accelerene, New York	lb.	4.75	@	
Accelemal	lb.	.55	@	.57½
Aldehyde ammonia crystals	lb.	1.35	@	1.50
Aniline oil	lb.	.33	@	.35
Excellerex	lb.	.65	@	.75
Hexamethylene tetramine (powdered)	lb.	1.40	@	1.60
Paraphenylenediamine	lb.	2.40	@	
Thiocarbanilide	lb.	.55	@	.75
ACCELERATORS, INORGANIC.				
Lead, dry red (bbls.)	lb.	.10¾	@	
sublimed blue (bbls.)	lb.	.08¼	@	
sublimed white (bbls.)	lb.	.08¼	@	
white, basic carbonate (bbls.)	lb.	.09	@	
Lime, flour	lb.	.01¾	@	.02½
Litharge, domestic	lb.	.09¾	@	.10¼
sublimed	lb.	.10½	@	
imported	lb.	.14	@	.15
Magnesium, carbonate	lb.	.12½	@	
calcined heavy (Thistle)	lb.	.11	@	
light (Manhattan)	lb.	.35	@	
Magnesium oxide	lb.	.65	@	
Magnesite, calcined	ton	50.00	@	65.00
ACIDS.				
Acetic, 28 per cent (bbls.)	lb.	.03	@	
glacial, 99 per cent (carboys)	lb.	.12½	@	
Cresylic (97% straw color)	gal.	.77	@	.80
(95% dark)	gal.	.72	@	.75
Muriatic, 20 degrees	cwt.	1.75	@	2.00
Nitric, 36 degrees	lb.	.06	@	.06½
Sulphuric, 66 degrees	ton	20.00	@	
ALKALIES.				
Caustic soda, 76 per cent (bbls.)	lb.	.05	@	
Soda ash (bbls.)	lb.	.03½	@	
COLORS.				
Black:				
Bone, powdered	lb.	.05	@	
granulated	lb.	.09	@	
Carbon black (sacks, factory)	lb.	.13	@	
Drop	lb.	.06	@	.15
Ivory black	lb.	.16	@	.30
Lamplack	lb.	.13	@	
Oil soluble aniline	lb.	1.25	@	
Rubber black	lb.	.08½	@	
Blue:				
Cobalt	lb.	.25	@	.35
Prussian	lb.	.85	@	.90
Ultramarine	lb.	.18	@	.40
Brown:				
Iron oxide	lb.	.03	@	.03½
Sienna, Italian, raw and burnt	lb.	.05¼	@	.15
Umber, Turkey, raw and burnt	lb.	.05	@	.07
Vandyke	lb.	.02½	@	.03½
Green				
Chrome, light	lb.	.37	@	.50
medium	lb.	.40	@	.50
dark	lb.	.50	@	
commercial	lb.	.14	@	
Oxide of chromium (casks)	lb.	.60	@	1.25
Red:				
Antimony, crimson, sulphuret of (casks)	lb.	.40	@	
Antimony, golden sulphuret of (casks)	lb.	.35	@	
golden sulphuret (States)	lb.	.30	@	
red sulphuret (States)	lb.	.25	@	
vermilion sulphuret	lb.	.55	@	
Arsenic, red sulphide	lb.	.20	@	
Indian	lb.	.08½	@	.14
Toluidine toner	lb.	4.00	@	
Iron oxide, reduced grades	lb.	.12	@	
pure bright	lb.	.16	@	
Spanish	lb.	.03½	@	
Venetian	lb.	.02½	@	.05
Oil soluble aniline, red	lb.	2.00	@	
orange	lb.	1.75	@	
Oximony	lb.	.18	@	

Vermilion, English, pale, medium, dark	lb.	1.55 @
artificial	lb.	.35 @
English quicksilver	lb.	1.60 @ 1.70
White:		
Aluminum bronze, C. P.	lb.	.55 @
superior	lb.	.60 @
Lithopone, domestic	lb.	.07 @ .07¼
Ponolith (carloads, factory)	lb.	*.07 @ .07¼
Rubber-makers' white	lb.	*.06½ @ .06¾
Zinc oxide, Horsehead (less carload, factory):		
"XX red"	lb.	.09 @ .10½
"Special"	lb.	.09½ @ .09¾
French process, red seal	lb.	.09½ @ .11
green seal	lb.	.10½ @ .12
white seal	lb.	.11½ @ .13
(States)	lb.	.08½ @
Azo, ZZZ, lead free (less carload factory)	lb.	.09¼ @
ZZ, under 5% leaded (less carload factory)	lb.	.08¾ @
Z, 8-10% leaded (less carload factory	lb.	.08¼ @
Yellow:		
Cadmium, sulphide, yellow, light, orange	lb.	2.00 @
red	lb.	1.85 @
Chrome, light and medium	lb.	.26 @
Ochre, domestic	lb.	.03 @ .07
imported	lb.	.05 @ .07
Oil, soluble aniline	lb.	2.00 @
Zinc chromate	lb.	.40 @

COMPOUNDING INGREDIENTS.

Aluminum flake	ton	@
Aluminum oxide	lb.	*.18 @
Ammonia carbonate, powdered	lb.	.12¾ @ .13
Asbestine (carloads)	ton	*25.00 @
Asbestos (bags)	ton	*35.00 @
Avoilas compound	lb.	.33 @
Barium, carbonate, precipitated	ton	80.00 @
sulphide, precipitated	lb.	.08½ @
dust	ton	90.00 @
Barytes, pure white	ton	32.50 @ 40.00
Barytes, off color	ton	22.50 @ 25.00
uniform floated	ton	40.00 @
Basofor	lb.	.05 @
Blanc fixe	lb.	.04½ @
Bone ash	lb.	.06 @
Chalk, precipitated, extra light	lb.	.05 @ .05½
heavy	lb.	.04 @ .04½
China clay, domestic	ton	8.50 @ 20.00
imported	ton	18.00 @ 23.50
Shawnee	ton	15.00 @
Cork flour	lb.	.53 @
Cotton linters, clean mill run, f. o. b. factory	lb.	.04 @
Fossil flour (powdered)	ton	60.00 @
(bolted)	ton	65.00 @
Diatomite	lb.	.02½ @
Glue, high grade	lb.	.35 @ .40
medium	lb.	.15 @ .19
low grade	lb.	.11 @ .14
Graphite, flake (400-pound bbl.)	lb.	.10 @ .30
amorphous	lb.	.04 @ .08
Ground glass FF. (bbls.)	lb.	.03 @
Infusorial earth (powdered)	ton	60.00 @
(bolted)	ton	65.00 @
Liquid rubber	lb.	.16½ @
Mica, powdered	lb.	.07½ @ .08
Pumice stone, powdered (bbl.)	lb.	.05 @
Rotten stone, powdered	lb.	.02½ @ .04½
Rub-R-Glu	lb.	*.20 @ .25
Silex (silica)	ton	22.00 @ 40.00
Starch, powdered corn (carload, bbls.)	cwt.	5.34 @
(carload, bags)	cwt.	5.12 @
Talc, powdered soapstone	ton	18.50 @ 22.00
Tripoli earth, air-floated	ton	35.00 @ 40.00
Tyre-lith	ton	90.00 @
Whiting, Alba (carloads)	cwt.	.80 @ .90
Columbia	cwt.	.80 @
commercial	cwt.	1.15 @ 1.20
English cliffstone	cwt.	1.75 @ 2.50
gilders	cwt.	1.35 @
Paris, white, American	cwt.	1.75 @
Quaker	ton	15.00 @
Wood pulp, imported	lb.	.03½ @
Wood flour, American	ton	40.00 @ 45.00

MINERAL RUBBER.

Gilsonite	ton	57.50 @ 60.00
Genasco (carloads, factory)	ton	55.00 @
(less carloads, factory)	ton	57.00 @
Hard hydrocarbon	ton	30.00 @ 65.00
K-X	ton	110.00 @
K. M. R.	ton	*40.00 @ 60.00
M. R. X.	ton	100.00 @
Pioneer, carload, factory	ton	55.00 @
less carload, factory	ton	57.00 @
Raven M. R.	ton	.50 @ .70
Refined Elaterite	ton	175.00 @
Richmond	ton	75.00 @
No. 64	ton	44.00 @
318/320 M. P. hydrocarbon	ton	50.00 @
Robertson, M. R. Special (carloads, factory)	ton	80.00 @
M. R. (carloads, factory)	ton	55.00 @ 60.00
Walpole rubber flux (factory)	lb.	.05 @

OILS.

Castor, No. 1, U. S. P.	lb.	.20 @
No. 3, U. S. P.	lb.	.19 @
Corn, refined Argo	cwt.	23.56 @
Cotton	lb.	.21 @
Glycerine (98 per cent)	lb.	.21 @
Glycerole	lb.	.55 @
Linseed, raw (carloads)	gal.	1.92 @
Linseed compound	gal.	.85 @
Palm (Niger)	lb.	.16½ @
Peanut	lb.	.25 @
Petrolatum	lb.	.07 @
Petroleum grease	lb.	.04¾ @
Pine, steam distilled	gal.	1.30 @
Rapeseed, refined	gal.	1.65 @
blown	lb.	.21½ @
Rosin	bbl.	18.25 @
Soya bean	lb.	.18½ @
Tar	gal.	.30 @ .40

RESINS AND PITCHES.

Cantella gum	lb.	.55 @
Tar, retort	bbl.	15.25 @ 16.00
kiln	bbl.	15.00 @
Pitch, Burgundy	lb.	.08½ @
coal tar	bbl.	7.50 @
pine tar	lb.	.04 @
ponto	lb.	.14 @
Rosin	bbl.	None
granulated	lb.	None
fused		None
Rosin, K	bbl.	20.50 @
Shellac, fine orange	lb.	1.45 @

SOLVENTS.

Acetone (98.99 per cent drums)	lb.	.17 @
methyl (drums)	gal.	1.15 @
Benzol, water white	gal.	.27 @ .31
Beta-naphthol, resublimed	lb.	1.00 @
ordinary grade	lb.	.55 @
Carbon bisulphide (drums)	lb.	.05½ @ .06¼
tetrachloride (drums)	lb.	.11 @ .13
Naphtha, motor gasoline (steel bbls)	gal.	.24½ @
73 @ 76 degrees (steel bbls.)	gal.	None
68 @ 70 degrees (steel bbls.)	gal.	None
Solvent	gal.	.20 @
V. M. & P. (steel bbls.)	gal.	.23½ @
Toluol, pure	gal.	.28 @ .32
Turpentine, spirits	gal.	1.67 @
wood	gal.	1.65 @
Osmaco reducer	gal.	.30 @
Xylol, pure	gal.	.35 @ .45
commercial	gal.	.30 @ .35

SUBSTITUTES.

Black	lb.	.10½ @ .21
White	lb.	.11 @ .23
Brown	lb.	.15 @ .22
Brown factice	lb.	.09½ @ .22
White factice	lb.	.11 @ .23
Paragol, soft and medium (carloads)	cwt.	18.58 @
hard	cwt.	18.08 @

VULCANIZING INGREDIENTS.

Lead, black hyposulphite (Black Hypo)	lb.	.52 @ .56
Orange mineral, domestic	lb.	.13¾ @
Sulphur chloride (drums)	lb.	.06½ @ .07
Sulphur, flour, Brooklyn brand (carloads)	cwt.	3.15 @
pure soft (carloads)	cwt.	3.40 @
superfine (carloads, factory)	lb.	.02⅝ @
(See also Colors—Antimony.)		

WAXES.

Wax, beeswax, white	lb.	.67 @ .68
ceresin, white	lb.	.16½ @ .18½
carnauba	lb.	.47 @ .85
ozokerite, black	lb.	.60 @ .70
green	lb.	.85 @ .87
Montan	lb.	.28 @ .30
substitute	lb.	None
paraffine, refined 118/120 m. p. (cases)	lb.	.09½ @
123/125 m. p. (cases)	lb.	.09¾ @
128/130 m. p. (cases)	lb.	.10¾ @

*Nominal.

PAN AMERICAN SOCIETY DINNER.

The Secretary of the Treasury as president of the United States section of the International High Commission has accepted the offer of the Pan American Society to give a dinner in New York to the foreign delegates to the Second Pan American Financial Conference.

This dinner, which will conclude the official program of the conference, will take place at the Waldorf-Astoria at 7 p. m., Monday, January 27, 1920. Prominent rubber men on the dinner committee include E. H. Huxley, William S. Kies and Frank A. Vanderlip.

INDIA RUBBER WORLD
FOUNDED 1889

Vol. 61 JANUARY 1, 1920. No. 4

TABLE OF CONTENTS.

Editorials: Pages
- New Year's Greetings! ... 201
- The Industrial Relations Committee ... 201
- American Rubber Plantations in Mexico ... 201
- Labor Famine Not to Be Feared ... 201-202
- Planting Hevea in the Philippines ... 202
- "Tech's" New Industrial Plan ... 202
- An American Rubber Reserve ... 202
- Looking Ahead in Rubber ... 202
- Heavy Service Tires ... 202

Three Hundred Million Pounds of Chrysil Rubber. Illustrated 203-204

Peace Problems and Progress ... Illustrated 204

Making Arctics by Machinery ... Illustrated 205-206

Reactions of Accelerators During Vulcanization By C. W. Bedford and Winfield Scott 206-207

Volume Increase of Compounded Rubber Under Strain ... By H. F. Shippel—Charts 208-210

United States Army Methods of Procuring and Salvaging Rubber Articles ... By John J. Cameron. Illustrated 211-213

War Department Specifications for Mechanical Rubber Goods. Air Brake and Signal Hose and Gaskets. Steam Hose ... 214-216

Detection and Determination of Glue in Rubber Goods ... By S. W. Epstein and W. E. Lange 216-217

Chemistry:
- What the Rubber Chemists Are Doing ... 218-220
  Aging Experiments on Vulcanized Plantation Pará Rubber. Practical Synthetic Rubber. Natural and Artificial Rubber.
- Chemical Patents ... 220
- Laboratory Apparatus ... Illustrated 220

Machines and Appliances ... Illustrated 221-222
Machine for Cutting Pressed-on Truck Tires. Recording Thermometers for Rubber Vulcanizers. Vertical Cement Churns. Sectional Tire Core Remover. Brake Lining Cutter. Ilgair Unit System of Heating.

Machinery Patents ... Illustrated 222-223
Elastic Fabric for Tire Building. Demountable Rim for Solid Tires. Pneumatic Tire Tread Slicing Machine. Other Machinery Patents.

Process Patents ... 223

New Goods and Specialties ... Illustrated 224-225
An Inhaler with Rubber Valves. A New Cord Tire Sole. Transparent Tobacco Pouches. A British Motor Waterproof. An Attachment for Pencils, etc. "Tire Life." A Truck Cord Tire. The "Triangle Tread" Cord Tire. A Belt with a Grip. "Nitrex." Another Non-skid Heel. Attractive Wheels. "A Tire within a Tire." "Lightning" Letter-Opener. A Curling Shoe.

The Rubber Association of America, Activities of ... 226-227

Obituary Record ... 228-229
George E. B. Putnam (portrait). W. E. Rice. R. E. Wright. Mrs. Augusta Neidner.

Inquiries and Trade Opportunities ... 229

Customs Appraiser's Decisions ... 229

Interesting Letters from Our Readers ... Illustrated 230

The Editor's Book Table ... 230
"A Rubber Plant Survey of Western North America."

New Trade Publications ... 230

Question of Tire Guaranties and Adjustments. Illustrated 231-232

Dunlop Rubber Co. Plans to Enter American Tire Market ... Illustrated 232-233

American Rubber Trade—News Notes and Personals 234-236
- Dividends ... 234
- Financial Notes ... 234-235
- New Incorporators ... 235-236
- Arthur W. Stedman, Jr. ... Portrait and Sketch 236
- John T. Spicer ... Portrait and Sketch 237
- Owen Moynihan ... Portrait and Sketch 239
- W. D. Shilts ... Portrait and Sketch 239

Domestic Correspondence:
- Eastern Notes ... 237
- New Jersey ... By Our Correspondent 237-238
- Massachusetts ... By Our Correspondent 238-239
- Ohio ... By Our Correspondent—Illustrated 240-241
- Mid-Western Notes. By a Special Correspondent 241-242
- Pacific Coast Notes ... By Our Correspondent 242-243
- Canadian Notes ... 245

First Annual Banquet and Meeting of Mid-West Rubber Manufacturers Association—Illustrated 244-245

Foreign Rubber News:
- Great Britain ... By Our Correspondent 246-247
- European Notes ... 247
- German Rubber Registrations End—Trade Faces Economic Difficulties—Special Correspondence 247-248

Y. Miyagawa ... Portrait and Sketch 248

Planting:
- Para Rubber in Mexico—Some Reminiscences—By J. L. Hermessen ... Illustrated 249-250
- Rubber Planting Notes ... 250
- The Balata Industry in the Colony of Surinam—By J. Barkley Percival—Illustrated 251-253

Patents Relating to Rubber ... 254-255
United States. Canada. United Kingdom. New Zealand.

Trade-Marks ... 255-256
United States. Canada. United Kingdom. New Zealand.

Designs ... Illustrated 256
United States. Canada.

Cotton Notes ... 256

Markets:
- Crude Rubber ... 257
  - Highest and Lowest Prices ... 257
  - Amsterdam Rubber Market ... 258
  - Antwerp Rubber Market ... 258
  - Batavia Rubber Market ... 258
  - Singapore Rubber Auctions ... 258
- Reclaimed Rubber ... 257
- Rubber Scrap ... 264
- Cotton and Other Fabrics ... 264-265
- Chemicals and Ingredients ... 266-267

Statistics:
- Antwerp Rubber Arrivals ... 259
- Brazil, Exports from Pará, Manáos and Iquitos ... 258
- Canada, Statistics for September ... 264
- Cotton—Annual Statement of the Egyptian Cotton Crop ... 265-266
- Deli (Sumatra) Rubber Exports ... 258
- Federated Malay States Rubber Exports ... 258
- Italy, Statistics for Six Months Ended June ... 263
- Java Rubber Exports ... 258
- Straits Settlements Rubber Exports ... 258
- United Kingdom Statistics for October ... 263-264
- United States:
  - Crude Rubber Arrivals at New York as Stated by Ship's Manifests ... 259-261
  - Statistics for October ... 261
  - At Pacific Ports as Reported ... 261
  - Exports During October, 1919 (By Countries) ... 262-263

THE GUTTA PERCHA & RUBBER MFG. CO.

ESTABLISHED 1855

MANUFACTURERS OF

RUBBER BELTING, PACKING, HOSE, MATS, MATTING

AND

MECHANICAL RUBBER GOODS

OF EVERY KIND

Warerooms: Nos. 126-128 Duane St., NEW YORK

BRANCH STORES:

301 West Randolph St. CHICAGO	71 Pearl Street BOSTON	241 Chestnut Street PHILADELPHIA	34 Fremont Street SAN FRANCISCO

HENRY SPADONE, Pres. WALTER W. SPADONE, Vice-Pres. ALFRED A. SPADONE, Sec'y GEO. B. DICKERSON, Treas.

HOOD RUBBER CO.

MANUFACTURERS OF

Rubber Boots and Shoes

Rubber Sole Canvas Shoes

Tennis Shoes

Pneumatic Tires and Tubes

Solid Tires for Trucks

WATERTOWN, MASS.

63 YEARS

1856 TYRIAN TRADE MARK ESTABLISHED 1856 1919

Tyer Rubber Co., Inc.

Manufacturers of

DRUGGISTS' RUBBER GOODS

"TYRIAN"

Automobile Tires and Inner Tubes

Stationers' Rubber Bands

RUBBER MOLD WORK A SPECIALTY

ANDOVER, MASS., U. S. A.

H. A. ASTLETT & CO.

113-117 Pearl Street, New York

CABLE ADDRESS, "ASTLETT," NEW YORK

CRUDE WASHED & REFINED RUBBER

E. D. HEWINS, Inc. Selling Agents
72 Lincoln Street Boston, Mass.

HOSE AND BELTING DUCKS, MORRIS & CO., Inc. SPECIAL FABRICS

GLAZED CAMBRICS HOLLISTON MILLS

INDIA RUBBER WORLD

CAOUTCHOUC HEVEA BRASILIENSIS FOUNDED 1889 DICHOPSIS GUTTA GUTTA-PERCHA

U. S. Pat. Off. Reg. United Kingdom

Edited by HENRY C. PEARSON

Vol. LXI. No. 5. FEBRUARY 1, 1920 35 CENTS $3.00 Per Year. $3.50 Abroad.

Entered as second-class matter October 4, 1899, at the post office at New York, N. Y., under the Act of March 3, 1879.
Published monthly at 25 West 45th Street, New York.

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC GUTTA-PERCHA
Reg. United States Pat. Off. Reg. United Kingdom.

Published on the 1st of each month by

THE INDIA RUBBER PUBLISHING CO.
No. 25 West 45th Street, New York.
Telephone—Bryant 2576.
CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, F.R.G.S., Editor

Vol. 61. FEBRUARY 1, 1920. No. 5

SUBSCRIPTION: $3.00 per year, $1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, $3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft. Post Office or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

DISCONTINUANCES: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

TABLE OF CONTENTS ON LAST PAGE OF READING.

AS TO STRIKES AND UNREST.

There never was a time in the memory of man when so much thought was put upon industrial conditions as at the present. Pamphlets by the ton are sent broadcast, by Government, by banks, by individuals. Profit sharing, shop parliaments, workingmen's councils, pension plans, beneficent legislation, are but a few of the panaceas earnestly advocated. Most, if not all of them, have been tried, and more during the past year than in any previous year. And the number of labor rows has been the greatest yet. It is only fair to say, however, that the benefits above enumerated were not responsible for the labor unrest. That was largely a war aftermath.

There should be some sane basis upon which industries could be run which would obviate unrest and strikes. As we ponder the subject, it occurs to us that the Standard Oil Company, of all the big corporations, does not seem to be strike stricken. If that is so, what is the secret? John D. Rockefeller, Jr., who speaks wisely and well, recently said:

"The Community's right to representation in the control of industry and in the shaping of industrial policies is similar to that of the other parties" (namely, Capital, Management, and Labor). "Were it not for the Community's contribution, in maintaining law and order, in providing agencies of transportation and communication, in furnishing systems of money and credit and in rendering other services—all involving enormous outlays—the operation of Capital, Management and Labor would be enormously hampered, if not rendered well nigh impossible.

"The Community, furthermore, is the consumer of the product of industry, and the money which it pays for the product reimburses Capital for its advances, and ultimately provides the wages, salaries and profits that are distributed among the other parties."

That is good talk, even if gasoline is high. But exactly how does the S O C O deal with the walking delegate and the agent of the Soviet? Is it not possible that the industrial giants who founded the greatest of American enterprises have solved the problem and are perhaps themselves unaware of it?

THE RUBBER CORED GOLF BALL.

Talk of standardizing golf balls, and even of a return to the solid gutta ball is in the air. It is all because of the far flying rubber cored ball. From the day of its advent it very much upset oldtime golfers. That a Yankee should produce a ball that made the "guttie" seem like a lump of inert dough was unbelievable. And that this golfing world should accept it with prompt enthusiasm was almost criminal.

So the rulers in golfdom ponder and plot to stay the long flights and to get back to the ancient one hundred and fifty yard drive. Of course it cannot be done. Professional, amateur and dub yearn for distance. If a half-mile ball appears it will be eagerly bought and universally used.

Standardization spells the end of experiment and the death of progress. Better "bide a wee."

RUBBER MACHINERY TRIUMPHS.

From the beginning of rubber manufacture, in the 'forties, the machinery was of the simplest, washers, mixers and calenders, together with churns and spreaders and for curing, dry heaters, steam vulcanizers, and presses comprised the usual equipment. From time to time some minor machine, usually borrowed from some other industry, was installed and its presence kept secret as long as possible. For years the only notable change was in the line of improvement of existing machines. This resulted in huge washers and mixers, mammoth calenders, gigantic presses and a great variety of spreaders. To be sure, an occasional invention appeared as in the sole cutting, hose making, and ball making machines.

The industry, however, continued one in which most of the work of making up was done by hand. The knife, die, roller and stitcher reigned supreme. For decades no notable machine appeared that in any way altered the solution.

With the sudden demand for tires, however, another spirit was almost at once evident. Greatly increased production was only to be reached by the help of machinery. Machines, therefore, began to appear.

In 1909 the records show 20 new machines produced for rubber use and in the following ten years the production gradually increased until 200 new machines appeared in 1919. These, as would be expected, were chiefly for use in tire manufacture.

At the same time, however, the impetus given to one branch of the industry was reflected in the others, and in shoes, druggists' sundries and mechanical goods new processes and new machines came into being.

This growth in mechanics is not only phenomenal but is one of the surest indications of the stability of the business. It assures, more than anything else, its ability to compete with all comers. All of the valuable machines will without doubt be copied and used. But the ability to create cannot be copied nor counterfeited and therein lies the key to continual success.

CRIPPLE CREEK RUBBER.

Ten years ago Dr. J. C. Ross discovered in the low-grade gold ore of Cripple Creek a product "that was high-grade caoutchouc." This is so because he said it and the press of the country affirmed it. Even after wasting a half score of years to welcome "Cripple Creek rubber" we do not say the learned Ross was a falsifier or that he was even mistaken. We, however, venture to point out that the gold mine operators who claim that excessive labor costs are likely to close their mines, may be overlooking a valuable product. Why not mine the rubber and sell the gold as a by-product?

RUBBER STEALING STOPPED.

One of the least known accomplishments of the Treasury Department and one for which rubber manufacturers cannot be too grateful was the campaign to break up the gangs that subsisted by the systematic looting of freight from cars in the yards and in transit. It is a disgraceful fact that shippers had most to fear from railroad employes who helped themselves liberally to goods entrusted to their care. The losses paid by the railroads amounted to $120,000,000 in four years, half of which was due to the railroad men's pilferings. Crude rubber was a favorite article of loot, being easily disposed of and almost impossible to identify. A law passed by Congress, called the Carlin bill, providing heavy penalties for thefts of this nature did but little good.

When the Government took charge of the railroads it took to itself the task of rounding up and punishing the thieves. More than 1,000 freight car thieves were arrested, over 500 were convicted, and 250 received prison sentences. Judges on the bench showed no mercy to this class of offenders, and for the first time in years rubber in transit was safe. This is not, however, an argument for government ownership.

PLANTING FOR PLASTICS.

Gum elastic, once a wild product, is now one of the most successful plantation products. Gum plastic, in other words gutta percha, still continues almost wholly a product of the wild. This, too, in spite of the constantly increasing commercial uses and abnormally high prices. The great gutta producers, the Sapotads, are trees of slow growth, found only in the real tropics. Capital could not probably be secured to plant the *Dichopsis*, the *Mimusops* or the *Achras Sapota*.

There are, however, many shrubs in the tropics, subtropics, and in the temperate zones that carry plastic gums. Is not an examination of all of them about due? Further, is it not perfectly possible that taken under cultivation some of them might add notably to the world's supply of gum plastic?

CHEWING CHICLE.

The chewing gum habit, in spite of the efforts of the fastidious, grows apace. The American troops carried it to England and France where it seems to be established. Now it is moving Westward, so much so that a big factory is to be established on the Pacific Coast. Soon it will move on to the Orient. Nor is this to be too much regretted. There are worse habits. Tobacco or betel nut chewing are more offensive. Moreover athletes and aviators say gum is helpful, physicians say it cures gout and dyspepsia, and (this has not been verified) it is said that the Cockney Englishman with a wad of gum in his mouth does no longer drop his h's.

PNEUMATIC VS. SOLID TRUCK TIRES.

It is becoming more and more evident that the pneumatic tire is likely to oust the solid on the heavy truck, just as it did on light vehicles. The first cost is naturally heavy, and punctures unavoidable, but the saving more than offsets both of these items. Twice as much speed is possible without injury either to engine or freight, and the weight of the chassis can safely be reduced nearly one half. Big trucks are equipped with "giant pneumatics" to-day. One wonders if in time these huge tires will be pigmies compared with the tires of the future.

Twentieth Annual Dinner of The Rubber Association of America, Inc.

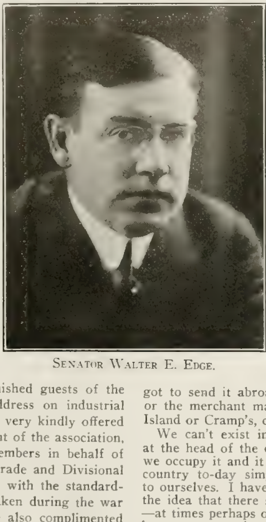
With 1,000 members and guests present, an exquisite menu, three prominent speakers, and excellent music, the dinner at the Waldorf Astoria on the evening of January 5, 1920, was a distinct success.

Despite the prevailing drought, this being the first dry banquet in the history of the association, there was no lack of enthusiasm. Indeed, all present made light of the matter, the speakers capitalized the situation and several humorous allusions to the advent of national prohibition created considerable merriment.

Prior to the dinner the members and their guests assembled informally in the various reception rooms, renewing old acquaintances and making new ones. Upon the opening of the grand ball-room doors the banqueters took their allotted places in the beautifully decorated hall to the tune of a spirited march by the orchestra. On account of the greatly increased attendance the main floor proved inadequate and twenty-five tables had to be placed in the first tier boxes. Each guest was provided with a tasteful souvenir program and menu bearing the seal of the association.

During the banquet popular selections by the orchestra lent added zest to the choice viands, and after the diners had done full justice to the final course the assemblage was called to order by the toastmaster, Homer E. Sawyer. Meanwhile the balconies had filled with ladies come to witness the animated scene and to hear the speeches.

After a standing toast to the President of the United States had been drunk to the air of "The Star Spangled Banner," the toastmaster gracefully waived the more or less customary presidential address in order more speedily to present the distinguished guests of the evening. He had prepared an elaborate address on industrial relations, he explained, but Mr. Schwab had very kindly offered to take it off his hands. However, as president of the association, Mr. Sawyer bespoke the gratitude of its members in behalf of the Traffic, Statistical, Legislative, Foreign trade and Divisional Committees, whose good work in connection with the standardization and conservation which were undertaken during the war will be of equal benefit in peace times. He also complimented Mr. De Lisser and the Dinner Committee upon the complete success of their arrangements for the evening.


Senator Walter E. Edge.

SENATOR EDGE'S ADDRESS.

Honorable Walter E. Edge, United States Senator from Trenton, New Jersey, spoke on reconstruction policies. Referring to the dilatory tactics of the Senate, and asserting that this country is practically waiting on Congress, his address was in part as follows:

Emerging from a war but a little over a year ago so successfully, with the plaudits of all the nations of the world, the admiration and the respect even of our enemies, the entire world speaking of America's part with pride and appreciation—to-day, successful in war, we have not demonstrated the same ability to be successful in times of peace. Business has been hesitating, conditions have been uncertain—continued strife between capital and labor, and all the difficulties, apparently, before us, are yet in great part to be solved.

GOVERNMENT MUST COOPERATE WITH BUSINESS

The question is, what is the solution? Fundamentally, my view of the solution—and I will pass over the question very rapidly—fundamentally my view of the solution is simply this: that the government of a nation just as the government of a state, should not enter into a business, but should cooperate with business. A government that has plainly demonstrated that it cannot run its own business successfully, cannot run the business that has been run by the business world. The only thing the Government can do in my judgment to bring the Government of the country—just as we tried in a modest way to do in New Jersey—to bring the Government where the people may have control of it, is to take advantage of the Constitution—and it is a mighty liberal document—and to cooperate with business; regulate business where it is necessary—do not overregulate it—but choose the great powers of the Government and the great powers that are centralized there and have them encourage business and initiate an enterprise and energy that in the past has made the country great and has given us the position that we occupy to-day among the countries of the world.

PROSPERITY REQUIRES A LARGE FOREIGN BUSINESS.

I have been somewhat interested in a modest way to try to help solve some of these problems, in seeing if it were not possible to pass legislation to enable us to do a larger business abroad. You are interested in exportation. You will have to be interested in exportation if your business is going to develop. We have built a magnificent merchant marine, and you have at your table tonight the one man who is mainly responsible for the making of a businesslike merchant marine.

What in the name of heaven is the good of a merchant marine if we are going to send it abroad filled with ballast? We have got to send it abroad filled with American goods and products, or the merchant marine might just as well be scrapped in Hog Island or Cramp's, or some of the other shipyards of the country.

We can't exist in this country to-day—we occupy a position at the head of the council table of all the nations of the world, we occupy it and it is up to us to keep it—we can't exist in this country to-day simply manufacturing goods and selling goods to ourselves. I have absolutely no patience with the thought and the idea that there should be an embargo on American products—at times perhaps on some specific food supply or another, yes—but as a general policy or proposition that there should be an embargo on American products, far from it. The way this country is going to prosper and continue to broaden and hold the position that it has gained is by doing business with all the countries of the world and by using the merchant marine that Mr. Schwab and his associates brought together, so that the American flag will go to every port in every part of the world—the only way that the country can possibly prosper.

BANKING FACILITIES MUST BE ENLARGED.

And we are met with this condition: that we can't send goods abroad unless we are going to be paid for them. We are still business men. We have a good lot of humanitarian feeling and we demonstrated that, and I hope we shall always have it, and we are ready to help rehabilitate Europe, but at the same time it must be a business proposition. We can't to-day send your rubber goods abroad unless we give one or two or three years' credit, as a rule, that is, in big supplies. They have not the money. They have only securities. We have the goods. We have the ships. We want to do business with them. Then the natural

The Rubber Association Banquet.

Twentieth Annual Dinner of The Rubber Association of America, Inc., at the Waldorf-Astoria, New York City, January 5, 1920.

question was, "How can those—to use the popular term various conditions be functioned?" Simply by enlarging the American banking system, just as we establish a bank here or in a small town or a large town to-day and do a domestic business and develop the business there; enlarge our banking system so that we can do business with them. They are doing it in England and they are taking the South American trade, and they are going to beat us right to it unless we get busy. Somebody ought to take advantage of the world's great opportunities. It is the natural evolution from the great World War.

INTERNATIONAL TRADE BANKS.

We passed a bill providing that we can now establish, under the Federal Reserve, trade banks for international banking. What do they do? The man abroad wants to buy $100,000 of your products. He has not got the money. He has a mortage that he can give you or something else which perhaps he can give you. He has got security. You cannot take it over. We have provided, however, a banking system so they can take those securities after investigating them, issuing on those securities bonds and debentures to the American public, giving you your cash. Off go the goods, and we are doing business all the time.

Charles M. Schwab.

RATE OF EXCHANGE NOW PROHIBITORY.

What else does it do? To-day the rate of exchange, as you all know, if you are at all interested in export business, is absolutely prohibitory. In France they have to pay two to one. A franc worth 20 cents is ten cents. In England a pound sterling was never so low as in the last month or six weeks. They have to pay 25 per cent off the normal. Don't live in a fool's paradise. They are buying now simply the goods they have to have. They won't pay any such tremendous premium as the present rate of interest makes necessary because they won't have to do it.

We have simply got to arrange over here so that we can equalize trade balances or credit balances in order that the rate of exchange will naturally decrease, so that normal times, at least comparatively, can come back in the near future. And when we establish these banks and take these securities from abroad and bring them over here and send the goods over, then we are gradually building up—just the same as imports would build up—so that the trade credit balances gradually equalize and the rate of exchange automatically goes down. That is one of the natural advantages of dealing in foreign securities.

THREE WAYS TO EQUALIZE EXCHANGE.

There are only three ways that I ever heard about by which you can equalize exchange or trade conditions; one is by the importation of goods, another is by the importation of gold, and the other is by purchasing securities. We are now trying to arrange so that we can purchase their securities—they haven't any gold to speak of. Imports we want as we want them, but the main thing is to buy their securities and to send our goods over and for the American business man to make a profit on the goods and to use Mr. Schwab's merchant marine as a practical proposition, rather than simply a sentiment.

The Government now has provided the way and the method. And I believe that in the countries abroad, if the Government will continue to cooperate and hold business, rather than to run business—we can retain the position that the world apparently is ready to accord to us.

IMPORTANCE OF PEACE TREATY RATIFICATION.

Touching with approval upon the recent activities of the Department of Justice in dealing with some of the diseases now infecting the country, and offering "Export, Import and Deport" as a timely text for the nation, he passed on to the need of ratifying the peace treaty:

Speaking personally, I hope that Congress expeditiously, and without unnecessary partisan rancor or playing for position, gets clear of the peace treaty and ratifies it. As a Republican I have stood, however, and will continue to stand, for the following position: when the Constitution was adopted—we had nothing to do with it—it charged and delegated to the United States Senate certain responsibilities. It is not empty; it means something or we should abdicate our position. I believe and stand for very positively—as I hope my record has testified—that we must protect beyond any question of future doubt the independence and sovereignty of our own country. But in doing that—and that can be done very easily—we should not evade any responsibility in times of peace as we have not evaded any in times of war.

WOULD END BUSINESS HESITATION.

I think much of this business hesitation will be behind us and men will go forward with a determination and an energy that has been just a little lacking in the last twelve months because of uncertainty as to what would happen in Washington. I believe it will go forward with renewed vigor, and perhaps the vacation of a year won't be so bad for us after all, if Congress will decide, if the Senate will ratify the treaty, properly reserved, so that there can be no question of the honor and integrity of our country when it comes to future crises or future decisions to make; that they will dispose of it, and thus send the message out to the industrial section of the country, which means practically all parts of the country; that then it is up to the business men of the country to get busy.

National prosperity depends absolutely on national contentment. National contentment depends to a great extent on employment, and employment, of course, depends to a great extent on the demand for production. You can't increase production unless you have the market. You can't increase production if you narrow the market. That is the reason I am so interested in the exportations, the development of exportations.

FOREIGN CREDITS THROUGH TRADE PROFITS.

We loaned nine billions of dollars during the time of war abroad, and we should have loaned it. We now are not even getting our interest. Perhaps we will. I hope so. I am forgetting it. But we are asked to extend more credit. Isn't it better to develop our own export business and send the goods abroad and make a profit on them, than to receive more money only by taxation? That is the only way we can raise it—in order to lend it abroad. In one way we tax you to lend the money. In the other way you make a profit and we do business. That is the difference between the two systems. I hope Congress recognizes that, and I believe they will. I do not want to be too critical of Congress. They have great responsibilities facing them to-day in the relationship between Congress and the business of the country. We ask for your cooperation, we ask for your advice, and above all, we ask for your confidence.

MR. SCHWAB'S ADDRESS.

In presenting the chairman of the board, Bethlehem Steel Corp., New York, who spoke on the tendencies and the future of American industry, its opportunities, needs and duties, the toastmaster very aptly and eloquently introduced him in these words:

A general of industry, who rose from the ranks; an exponent of the square deal for labor, capital and the republic; a notable example of the opportunity that America offers to those of her citizens who use and develop the gifts that God has given them; a dreamer of great things, but not visionary; a leader of men,

not a driver, a type of the men who have made the foundation of our country in the past and embody our hope for the future; a typical American; the Theodore Roosevelt of our industry, Charles M. Schwab.

Mr. Schwab spoke in part as follows:

ECONOMY FUNDAMENTAL TO EVERY INDUSTRY.

When I thought of what I might say to this body of gentlemen engaged in the rubber industry, the thought came back to me that, after all, the fundamentals of all industry are alike. Industry is founded for permanent success upon one great condition, and that is economy. I wonder how many of you think of that point? Years ago, as a younger man, and perhaps more ambitious, I used to go to Mr. Carnegie, as president of his company, with the proud statement that we had made four, five or six hundred thousand. Wise old gentleman that he was, he would shake his head, saying, "That interests me not, but show me how cheaply and how well you made it."

Because the conditions of business may make a great profit for you even though the business is badly conducted. But let the economy of production and its distribution be right and the country for all time shares the success of her industry.

ENCOURAGEMENT OF LABOR ESSENTIAL.

Now, gentlemen, what was applicable to that great company is applicable to this great country to-day. It is true that we must take measures suited to the times to aid and help industry. But the one thing that will stand us always to the good is to say of our industries that no matter what the conditions or times, or what is the condition of trade here, our industry will be permanently established for this country and for the world.

Lieut.-General Robert L. Bullard.

Now, what does economy mean? I wonder if you have ever analyzed it? There is nothing that lends value to any manufactured article but labor You may say that in the manufacture of tires or in the manufacture of steel, labor is but 20 or 25 per cent of the cost, but you go back to the man who finds the rubber on the rivers of Brazil, cr the man who digs the iron ore in the fields of Minnesota, or the railroads that carry the ore to the places of manufacture, and all of these agencies that carry things to the final crucible of manufacture, and all of it is nothing more than labor. There is no real cost in a manufactured article but labor. Now then, what is the question that will enable us to become permanently the best interested in economy? It is the management and the disposition and the encouragement of labor. We manufacturers of this country have been great autocrats in the years gone by so far as labor is concerned. Labor has not had its fair share of the prosperity of this great and glorious country of ours. And it is a thought that must be borne home as we stop and listen and realize that a man is a man no matter what his position in life as long as he does his duty honestly and conscientiously and for the good of his country and his fellow-men.

LAWS NEEDED TO PROMOTE SHIPPING.

Replying to Senator Edge's remarks regarding America's hastily built fleet of merchant ships, Mr. Schwab said:

I want to say a word about this great merchant marine that our distinguished senator has spoken about. I want to tell you what my thoughts about it are. This merchant marine that has been built by the United States, true to the traditions of the United States, and that he has so eloquently described, has cost about three or four times what any merchant marine ought to have cost, but we have got to charge it all off as an incident of the war and start in afresh again.

Now, you can dot the seas of the world with the merchant ships of the United States and you won't have a merchant marine without the soul and inspiration and the capital of the American business men to make it go. The merchant marine will be of value to every manufacturer and every citizen of the United States. And if laws of the United States cannot be passed to make private capital profitable in business—in the shipping business—then the whole people of the United States in some manner ought to share the burden for the benefit of the United States. The Senate and the Congress shy at the word "subsidy." Well, call it by any other name, but as matters now stand the United States will never have a merchant marine worthy of the name merchant marine, or of the slightest value to this country unless some method of legislation is passed that will enable private capital and private enterprise to reap the profits and reap the benefit from the operation of its merchant ships.

This is the time when it is popular to decry capital. It is a great mistake, if the initiative and energy of the American business man is not allowed to have his reward for that development of industry. We may be called a material nation because we have not developed the arts and the sciences as the older nations of Europe have. I am proud of the fact that I am a citizen of a so-called material nation. Artists, painters, great soldiers, great generals and great admirals may like their names perpetuated in monuments and arches of marble and granite; for me, I shall be proudest if long rows of smoking stacks and flaming furnaces shall mark one step forward in the progress of industry.

BUSINESS AND LIVING ECONOMY NECESSARY.

Fundamentally, we must learn economy, not only in our business, but in our every act. We are living, to use a vulgar expression throughout the whole country to-day, like "drunken sailors," practicing extravagances such as have never been known in any time. Gentlemen we will reap the reward of that expenditure in the years to come by paying the penalty for the dance that we have had to-day. There is no good in preaching that we must practice economy. It will have no effect. It must be brought about by the stern necessities that will make us get down to the basis of living and acting economy that will bring us to a true manufacturing basis in this country. What a false position many men have in life who think that the acquisition of riches and the display of riches marks them as factors in men's affairs! The day has gone by when they will mark the man of benefit to his country and his fellow-men in that way. We must learn to live the simple life.

A GREAT CRISIS WOULD BE BENEFICIAL.

My friends, do not aspire to anything but successful conduct of that which you have undertaken. Accept the assurance of a man who has seen many phases of life. There is nothing worth while but the contemplation of successful accomplishment of the purpose for which you set out to do. Build up industries and make them successful. Make this great nation of ours stand permanently in the position which she has won in this great war. The Almighty has endowed us with natural resources second to no other nation in the world and above all with the people so imbued with patriotism, integrity and energetic ambition as to insure our success as the leader of nations for all time to come. Let us do our part. I believe that we will get to a true basis of economy only after some great crisis that may come upon us to make us realize what the true basis of economy is. The best man in business and in life is the man who has had to go through some crisis before he becomes truly and permanently grounded and fixed in the future success of his life, and what is true of men will be true of nations. We will go through it, and it is so well illustrated by the material on which your industry is founded, rubber; its chief characteristic is its elasticity. You can stretch it ten or twelve fold and it will come back to its original form, and so this great nation of ours; you may stretch it to its breaking point; you may stretch it ten to twelve fold, but the energy of its people will bring it back to the original

form that the Creator of all nations has destined that we shall occupy.

AMERICAN INDUSTRY TO PROSPER.

In concluding I want to draw one optimistic word, and that is, in my opinion, that whatever the crisis may be, it will be but temporary.

The industry of this country will go onward and upward for years to come, and in no industry do I think there will be such marked progress as the industry in which you gentlemen here are to-day engaged.

Feel optimistic, think optimistic, be optimistic, practice Christian Science in business and you will have the success that you merit. Treat your labor well. Make them partners with you. Allow them to have representation amongst their own forces. Do not permit the agitator from Kamchatka to tell you what to do with your labor in Worcester, Massachusetts. Do these things. Be fair. Treat all well. Then happiness and prosperity in your business is sure to follow.

GENERAL BULLARD'S ADDRESS.

Stating that to the surprise of the American people the war had shown that the officers in the United States army were not only educated men and fighters brave and chivalrous, but executives of able administrative capacity as well, the toastmaster sketched briefly their remarkable accomplishment of putting an effective army of enormous size into the field in record time, and introduced Lieutenant-General Robert L. Bullard, Commanding Officer, Department of the East, Governor's Island, as an exponent of the sort of ability which had made it possible.

General Bullard is a past master in the art of telling stories, and his brief address consisted largely of pertinent ones. Alluding to Mr. Schwab's remarks on industrial relations, and drawing a parallel from his own army experience, he said:

As your organization grows, you gentlemen are going to lose touch with humanity unless you take pains individually to preserve it. You have had very graphically pointed out to you the only way by which you can succeed and maintain your standards and the American standards, and that is by maintaining your relations with the men who are working under you. Gentlemen, when your organization grows, be prepared to pass the spark of humanity down to the last workman under you. Otherwise you have not got them. They will go from you.

MEMBERS AND GUESTS PRESENT.

AT THE PRESIDENT'S TABLE.

Bessell, Col. William,
Bourn, Hon. A. O.,
Broughton, John S.,
Brown, A. H.,
Bullard, Lt.-Gen. Robert L.,
Colt, Col. Samuel P.,
Cox, William C.,
Davol, Charles J.,
De Lisser, Horace,
Dunn, Harry T.,
Edge, Hon. Walter E.,
Firestone, H. S.,
Greene, Lt-Col. R. W.,
Hodgman, Geo. B.,
Lewis, Seneca G.,
Litchfield, P. W.,
Lowman, John S.,
McLaughlin, C. W.,
Maguire, John W.,
Morgan, John,
Rutherford, W. O.,
Sawyer, Homer E.,
Schwab, Charles M.,
Thornton, A. D.,
Wilson, Charles T.

ALPHABETICAL LIST.

A

Abbott, M. R.,
Abercrombie, J.,
Abraham, C. D.,
Adams, H. J.,
Agar, John L.,
Ahlstrom, Carl,
Ake, M. E.,
Allen, J. A.,
Altschuler, A. A.,
Anderson, E. A.,
Anderson, J. D.,
Anderson, V. T.,
Andrews, Barrett,
Andrews, E. S.,
Andruss, F. E.,
Appleton, F. H.,
Appleton, F. H., Jr.,
Appleton, L. E.,
Armstrong, H. G.,
Arnold, W. H.,
Asakage, A.,
Astor, A. M.,
Ayer, Benjamin,
Azua, Henri,

B

Babcock, F. Huntington,
Babcox, E. S.,
Bacon, H. M.,
Badenhop, Robert,
Bailey, I. R.,
Baird, Collier W.,
Baird, H. W.,
Baird, Robert B.,
Baird, R. L.,
Baird, W. T.,
Baird, W. T., Jr.,
Balch, W. H.,
Baldwin, J. C.,
Baldwin, S. D.,
Ballou, Roland H.,
Banbury, F. H.,
Band, C. S.,
Bankhead, Col. H. M.,
Barber, E. J.,
Barker, C. E.,
Barnard, Harold,
Barnes, C. W.,
Barnett, J. P.,
Bass, W. F.,
Bass, W. H.,
Bassett, T. W.,
Basten, Otto,
Bates, Austin,
Bates, G. D.,
Bates, George J.,
Bauman, H. A.,
Baybutt, R.,
Baxter, H. L.,
Beal, H. L.,
Beard, E. C.,
Beavers, C. G.,
Beckberger, W. A.,
Bedell, H. H.,
Bedford, Bruce,
Beecher, L. A.,
Behrend, Victor,
Bell, W. H.,
Benner, J. S.,
Benny, Elmer,
Bermingham, Dr.,
Berrien, W. P.,
Bers, Aaron,
Bertuch, Paul,
BeSaw, E. W.,
Best, F. P.,
Beynon, D. E.,
Bigelow, Bushnell,
Binder, Paul,
Bixler, H. W.,
Blackhurst, L. R.,
Blackwell, W. H.,
Blakow, Bernard N.,
Blanchard, G. A.,
Blanchard, J. C.,
Blandin, Victor C.,
Bliss, W. R.,
Block, Benjamin,
Boehm, Walter,
Bogardus, E. M.,
Bourn, A. O., Jr.,
Bourn, S. W.,
Bouton, P. B. L.,
Bower, C. L.,
Bracker, H. J.,
Braender, F. L.,
Braender, Harry,
Bragdon, L. M.,
Braham, J. J.,
Brewer, W. G.,
Briggs, Harold L.,
Brill, J.,
Brinckerhoff, E. A.,
Briscoe, Frank,
Broadwell, E. H.,
Brooks, E. H.,
Brooks, Col. Harlow,
Brown, Alvah H.,
Brown, Clarence A.,
Brown, James I.,
Brown, J. V.,
Brown, L. D.,
Bruyn, Frank S.,
Bruyn, W. E.,
Bryant, George B.,
Bryant, R. G.,
Bunker, Horace M.,
Burgeron, G.,
Burke, Daniel,
Burton, John R.,
Bush, Charles,
Butler, A. I.,
Butler, O.,
Butler, R. S.,
Byam, S. G.,
Byles, W. E.,
Byrne, F. L.,
Byrnes, J. W.,
Bullock, Hugh,
Burgess, W. L.,
Burkett, J. H.,
Burnham, Frank I.,
Burr, Albert E.,
Burrell, W. S.,

C

Caldwell, R. J.,
Caldwell, R. L.,
Campbell, C. E.,
Campbell, Phillip,
Campbell, W. S.,
Candee, C. N.,
Cannon, M. L.,
Carberry, John D.,
Carew, M. M.,
Carleton, W. S.,
Carlisle, C. H.,
Carpenter, H. D.,
Carroll, J. M. S.,
Cartmell, Van H.,
Casanovis, Augusto,
Case, C. C.,
Chace, Fred C.,
Chalfin, Joseph,
Chandler, John H.,
Chandler, John J.,
Charles, G. W.,
Chase, O. H.,
Chauncey, T. F.,
Chichester, Ira K.,
Chidester, W. H.,
Chipman, R. L.,
Christie, E. E.,
Christie, J. T.,
Clark, C. B.,
Clark, M. E.,
Clarke, C. S.,
Clarkson, C. F.,
Close, F. P.,
Conant, M. B.,
Conant, R. G.,
Cobb, J. H.,
Colman, Capt. E. C.,
Collyer, R. N.,
Comey, George P.,
Comey, M. L.,
Conlin, T. A.,
Connor, Frank A.,
Connor, J. A.,
Constable, George A.,
Converse, M. M.,
Conway, M. Y.,
Cook, C. E.,
Cook, C. S.,
Cook, F.,
Cook, G. A.,
Cook, Dr. Hugh F.,
Cook, Otis R.,
Cooke, J.,
Cooke, Vincent,
Cooke, W. G.,
Cooley, Fred,
Cordier, Col. C.,
Cornell, A. Boyd,
Coughlin, E. J.,
Coughlin, T. B.,
Coughlin, Thomas,
Courtney, J. H.,
Cowen, R. R.,
Cowenhoven, C. S.,
Craig, F. H.,
Crane, Robert,
Cranor, Donald,
Cranz, J. M.,
Craver, B.,
Creese, Wm. I.,
Crosselmier, F. A.,
Crowley, J. T.,
Culp, George K.,
Cummings, E. O.,
Cummings, H. H.,
Cummings, W. L.,
Cunningham, O. A.,
Currant, Watson,
Currie, Marcus,
Curtis, Fred L.,
Cutler, David A.,
Cutter, W. O.

D

Daggett, H. A.,
Dane, F. S.,
Daniel, F. W.,
Dann, C. A.,
Dashiel, W. W.,
Daum, George W.,
Davies, A. S.,
Davies, I. R.,
Davis, W. B.,
Day, L. Garnet,
Dayton, F. E.,
Dealaman, Adam,
Dearth, E. E.,
DeLanie, Edward,
Delapierre, H. B.,
DeLisser, R. L.,
Desmond, T. A.,
Devine, C. F.,
Devine, James F.,
DeVore, W. G.,
Dickerson, W. H.,
Diehl, Mr.,
Dodd, Samuel H.,
Dodson, J. E.,
Donovan, M. J.,
Dotin, E. B., Jr.,
Doty, H. F.,
Downey, Col. G. F.,
Drake, R. E.,
Drake, S. A.,
Drayton, Judson,
Driscoll, James,
Dryer, Alfred,
Duffy, L. A.,
Dumont, L. W.,
Dunbar, F. W.,
Dunbar, J. F.,
Dunbar, J. F., Jr.,
Duncan, W. W.,
Dunlap, William B.,
Dunn, William H.,
Durr, H. H.,
Duryee, A. R.,
Dwyer, T. A.

E

Eagles, R. M. P.,
Earle, Russell W.,
Earle, W. P., Jr.,
Edel, F.,
Eden, W. A.,
Edson, Franklin C.,
Ehrenfeld, William C.,
Elbogen, Mr.,
Elmendorf, A. R.,
Enstrom, William N.,
Erpf, Carl E.,
Erskine, Charles W.,
Erskine, L. G.,
Esaki, M.,
Evans, P. P.

F

Faber, E. Lot[illegible],
Farbank, L. G.,
Fargo, A. W.,
Farley, Russell,
Farrell, Franklin, Jr.,
Faulkner, A.,
Fauver, L. B.,
Feinburg, David,
Feinburg, Fred,
Feist, J. G.,
Fenton, Frank,
Fera, Henry, Jr.,
Ferris, R. W.,
Ficken, John H.,
Field, Harry E.,
Field, Mr.,
Fillingham, M. P.,
Finckel, C. B.,
Fineburg, I.,
Fink, V. W.,
Firey, L. H.,
Fisher, Robert C.,
Fisher, R. L.,
Fisk, H. G.,
Fitch, E. H.,
FitzGerald, F. B.,
Flint, H. A.,
Floyd, E. O.,
Foley, Frank,
Foutz, C. L.,
Fox, M.,
Fox, Frank F.,
Francis, Arnold W.,
Frank, A. A.,
Fraser, E. B.,
Frazee, W. C.,
French, H. W.,
Freshman, Charles,
Frey, Henry,
Fries, R. T.,
Friswell, A. E.,
Fuerth, Mr.,
Fuller, H. P.,
Fuller, R. H. B.,
Fulper, E. B.,

G

Gardner, L. D.,
Gardner, Thomas M.,
Garthwaite, A. A.,
Gaskill, J. W.,
Gassett, W. G.,
Gaston, William F.,
Gibbs, E. D.,
Gibbs, G. W.,
Gibbs, J. M.,
Gill, Harry G.,
Gillespie, W. F.,
Gillette, R. B.,
Githens, H. A.,
Glaenzer, G. B.,
Glass, R. E.,
Glidden, A. A.,
Goldman, Hermann,
Goodell, F. R.,
Goodrich, D. M.,
Goodwin, Leonard,
Gordon, A. E.,
Gotting, Louis,
Goudie, J. Q.,
Gould, Glenn C.,
Gove, F. G.,
Graham, F. L.,
Granzen, R. H.,
Gray, D. E.,
Gray, W. F.,
Green, Henderson M.,
Green, William,
Greene, Bartlett,
Greene, N. Lincoln,
Greene, W. E.,
Greenough, Allan B.,
Grieb, William G.,
Griffiths, R. T.,
Grow, George,
Grow, Samuel,
Gullion, Col. A. W.,
Gunn, J. N.,

H

Habich, G. E.,
Haigh, H. J.,
Haldane, D. D.,
Hall, George E.,
Hall, Harry T.,
Hall, W. W.,
Hamblen, C. W.,
Hamilton, G. H.,
Hamilton, Harry,
Hamilton, R. S.,
Hammerstrom, F. N.,
Handy, T. L.,
Haney, Thomas A.,
Hardenbergh, A.,
Hardin, C. W.,
Hardman, H. V.,
Hardman, J. H.,
Hardy, Alpheus S.,

Hardy, R. S.,
Hargrave, A.,
Harlowe, Mr.,
Harms, H. H.,
Harris, Col. F. E.,
Harris, S. W.,
Harrison, C. W.,
Harrison, M. M.,
Hart, William F.,
H[illegible], Kenneth,
Hastings, A. Abbott,
Hathaway, Mr.,
Hauff, Mr.,
Haviland, Marsten,
Hawthorne, George,
Haynes, C. R.,
Heistand, Col. H. O. S.,
Hemenway, M. L.,
Henderson, B. W.,
Henderson, F. R.,
Henderson, H. H.,
Hering, Henry F.,
Herman, E. C.,
Herman, F. C.,
Herron, J. W.,
Hever, Mr.,
Hewins, E. D.,
Hewitt, H. H.,
Heyworth, Lawrence,
Hebborn, George F.,
Hicks, Ellsworth H.,
Higgins, W. F.,
Hill, F. G.,
Hill, W. W.,
Himebaugh, L. C.,
Hirsch, Adolph,
Hitchcock, Carl,
Hodgman, Alfred P.,
Hodgman, S. T.,
Hodgman, S. T., Jr.,
Holcombe, H. W.,
Holmes, J. C.,
Homs, Pablo,
Hood, Frederic C.,
Hooven, C. E.,
Hopkins, Arthur T.,
Hopkins, M. G.,
Hopper, C. C.,
Horn, Mr.,
Hornberger, H. L.,
Hosier, H. B.,
Howe, Dr. Charles M.,
Howell, C. J.,
Hubbard, H. B.,
Huber, E. E.,
Huber, Fred G.,
Hughes, Charles A.,
Hughson, William L.,
Humphreys, Charles, Jr.,
Hutchens, Edward,
Hutchinson, F. M.,
Huxley, E. H.,

I

Inglis, J. A.,
Ireland, R. S.,
Irish, C. H.,
Iverson, J. V.,

J

Jackson, E. F.,
Jackson, J. H.,
Jacoby, E.,
Jaenicke, William,
Jahant, C. J.,
James, H. B.,
Jamieson, R. E.,
Jamieson, William,
Janney, G. Mason,
Janssen, Ern.,
Jeandheur, Mr.,
Jenckes, F. L.,
Jenks, Walter H.,
Jennings, R. R.,
Jewett, John J.,
Johnson, C. K.,
Johnson, F. Coit,
Johnson, F. H.,
Johnson, Franklin R.,
Johnson, J. T.,
Johnson, Stuart H.,
Johnson, Thomas,
Johnston, W. A.,
Johnstone, J. T.,
Jones, A. B.,
Jones, F. H.,
Jones, H. W.,
Jones, W. O.,

K

Kains, Archibald,
Kane, Thomas E.,
Kaufman, C. B.,
Kavenagh, W. E.,
Kearns, John,
Kelly, J. H.,
Kelly, T. J.,
Kendall, J. A.,
Kent, W. J.,
Kenyon, C.,
Kenyon, George,
Kershaw, R. R.,
Keyes, William,
Kimball, Thomas F.,
Kinee, I. I.,
Kip, Ira A.,
Kirkpatrick, L.,
Kissell, Frank A.,
Kittle, F. L.,
Kloss, George C.,
Kniften, F.,
Knowles, E. B.,
Knox, E. C.,
Kobayashi, T.,
Kochersperger, E. S.,
Koontz, R. B.,
Kraft, Harry,
Kratz, G. D.,
Kreitler, R. G.,
Kubie, David S.,
Kubie, Samuel,
Kugler, H. W.,
Kuhne, J. W.,

L

LaDow, Jesse E.,
L'Hommedieu, P. B.,
L'Hommedieu, S. Y.,
Lahey, F. T.,
Laklin, W. C.,
Laird, E. W.,
Laird, H. W.,
Lamont, Sloan,
Lamson, Mr.,
Landers, D. H.,
Landrum, Robert E.,
Landus, R. A.,
LaShelle, C. P.,
Laurie, Irving,
Lawson, W. L.,
Leahy, Frank,
Learned, James H.,
Leary, Thomas L.,
LePan, Louis N.,
Leatherow, Walter J.,
Ley, L. H.,
Liddell, William, Jr.,
Lincoln, H. F.,
Lindemann, Sidney,
Lindsey, H. A.,
Lindsey, Thomas S.,
Little, C. E.,
Littlejohn, Lomax,
Littlejohn, Lomax, Jr.,
Littlejohn, R. M.,
Livesey, E. V.,
Lloyd, A. E.,
Lloyd, A. E., Jr.,
Loeb, Milton,
Long, J. W.,
Lorentz, J. F.,
Louis, Joseph,
Lovatt, Frank W.,
Low, C. H.,
Lowe, L. L.,
Low, R. A.,
Lowell, E. E.,
Lowman, J. W.,
Lown, H. D.,
Lowry, S. W.,
Ludington, G. A.,
Ludwig, F. J.,
Lyon, F. H.,

M

Mackey, Mr.,
MacArthur, F. B.,
MacCusick, H. A.,
MacMichael, L. P.,
McDowell, J.,
McLaren, George,
McMaster, H. B.,
MacNamara, A. B.,
MacNamara, L. P.,
MacPherson, Warren,
McCaulley, W. J.,
McChesney, L. E.,
McDonald, C. P.,
McDonald, Mr.,
McDonough, A.,
McGregor, Donald,
McGregory, H. L.,
McCarthy, C. T.,
McGuire, C. N.,
McIntyre, John E.,
McKenna, F. R.,
McLaren, George,
McLaughlin, R. S.,
McLean, J. F.,
McMahon, William,
McMaster, H. B.,
Maass, Herbert H.,
Macaulay, R. R.,
Machlin, E. O.,
Machlin, F.,
Mackay, W.,
Macomb, John W.,
Maguire, T. A.,
Mahoney, P. H.,
Maloney, Peter,
Manchester, A. A.,
Mann, A. N.,
Marland, W.,
Marland, W. H.,
Marcotte, M. V.,
Martin, A. C.,
Martin, A. C.,
Martin, Bertram G.,
Martin, George W.,
Mars, Howard,
Martin, Walter L.,
Marvin, J. S.,
Massie, A. E.,
Mason, E. A.,
Mason, Herbert T.,
Mason, Jesse H.,
Matchett, Thos.,
Mathews, A. A.,
Maurer, Albert F.,
Maurer, Ed.,
Maurer, Paul I.,
Maus, John B.,
Mayo, George H.,
Maywald, F. L.,
Meade, James,
Meade, John,
Meinzer, F. H.,
Merriman, I. B.,
Metzer, William F.,
Metzler, Mr.,
Meyer, Mr.,
Meyer, E. T.,
Meyer, Otto,
Meyerfield, P.,
Meyers, A. C.,
Midgley, T. W.,
Miles, D. E.,
Millar, Hudson C.,
Millenthal, M.,
Miller, Charles E.,
Miller, Col. S. W.,
Miller, H. C.,
Miller, I. L.,
Miller, J. A.,
Miller, R. A.,
Miller, T. W.,
Miller, W. B.,
Millhoff, F. C.,
Milne, Gordon,
Miner, W. H.,
Mitchell, Seth,
Mitsui, B.,
Mock, David A.,
Mohlin, J.,
Moomy, Charles S.,
Montague, Charles,
Moomy, J. G.,
Montgomery, Henry,
Moore, F. M.,
Moore, J. T.,
Moore, John,
Moore, Tom,
Moore, William,
Morehead, H. J.
Morgan, E. L.,
Morris, Samuel S.,
Morse, C. A.,
Morse, W. M.,
Mowe, John V.,
Muehlstein, Chas.,
Muehlstein, J.,
Muehlstein, H.,
Muir, J.,
Mullen, W. F.,
Mullett, W. C.,
Murphy, P. A.,
Murray, Gen. C. Edw.,
Murray, M. E.,
Musselman, C. A.,
Myers, A. C.,
Myers, C. A.,

N

Naylor, R. B.,
Neal, Frank S.,
Neter, N. E.,
Newhall, Arthur B.,
Newman, Stanley,
Nickel, Fred B.,
Noble, Harry W.,
Noble, W. N.,
Nomura, S.,
Norwood, Guy E.,
Norton, W. H.,

O

Oakley, C. H.,
Oakley, L. M.,
O'Brien, F. W.,
O'Brien, Frank,
O'Brien, James,
Odell, James E.,
Odell, L. G.,
Oliver, J. W.,
Oliver, N. E.,
O'Neal, W.,
Oppenheim, J.,
Osborn, George W.,
Owen, W. D.,
Owen, W. C.,
Owings, W. R.,

P

Page, John E.,
Page, Wallace G.,
Palmer, H. G.,
Palmer, T. A.,
Pam, Mr.,
Pardee, A. L.,
Parks, E. B.,
Parsons, W. G.,
Partridge, A. G.,
Partridge, F. E.,
Partridge, G. L.,
Pasho, J. G.,
Patrick, R. W.,
Pell, Geo. E.,
Perlish, Henry,
Peters, F. V.,
Peterson, W. T.,
Peugnet, L. L.,
Peugnet, Ramsay,
Praff, Mr.,
Pfaff, Edward F.,
Pfeiffer, Wm. F.,
Pharis, Carl,
Phillips, A. D.,
Phillips, R. H.,
Pickard, C.,
Pierce, Lt-Col. P. E.,
Pinto, Peter P.,
Pitcher, Conrad N.,
Pitcher, W. L.
Plumb, L. J.,
Pohle, H. V.,
Porter, J. L.,
Pratt, B. H.,
Preston, E. R.,
Price, A. H.,
Price, P. B.,
Poor, S. S.,
Pusinelli, F. B.,

Q

Qualy, A. B.,

R

Rambonnet, H. A.,
Ramsay, Harvey W.,
Rand, LeRoy H.,
Randall, W. C.,
Rankin, W. H.,
Raymond, H. K.,
Rector, J. M.,
Reddy, H. H.,
Reed, I. Ely,
Reeve, Arthur,
Reeve, Geo. C.,
Reeves, Alfred,
Reilly, W. P. H.,
Rice, R. L.,
Richards, Thomas W.,
Richmond, C. A.,
Ridenour, L. H.,
Ridge, W. S.,
Rieder, T. H.,
Rigby, J. H.,
Rigdon, S. G.,
Rishel, J. A.,
Rivas, D. K.,
Robins, Thomas,
Roberts, James F.,
Roberts, Preston E.,
Robinson, Francis,
Robinson, J. P.,
Robinson, Nelson,
Rockhill, L. C.,
Rockwell, George C.,
Rodenbagh, J.,
Roe, M. W.,
Rogers, Walter F.,
Rosenblatt, Samuel R.,
Ross, E. B.,
Ross, Frank,
Rothschild, M.,
Rousmaniere, J. E.,
Rowland, J. W.,
Rowley, John,
Ruch, L. C.,
Russell, John,
Rutter, Frank S.,
Ryan, C. B.,

S

Saikai, S.,
Saunders, A. E.,
Saunders, W. E.,
Sandford, Geo. S.,
Sandford, H. R.,
Sanger, Elias,
Sangster, D. M.,
Sattler, E. A.,
Sawyer, A. M.,
Sawyer, Charles F.,
Sawyer, Homer E.,
Schaffer, F. F.,
Schaffer, F. W.,
Schafer, S. A.,
Scheel, H. S V.,
Scheinler, L.,
Scheuer, Arnold L.,
Schleussner, P.,
Schulthess, Ernest,
Schutz, C. C.,
Schutz, E. J.,
Schwartz, Charles,
Schwartz, M.,
Schwartz, S. L.,
Schwartz, S. Robert,
Schworm, George S.,
Seaman, F. A.,
Sears, S. H.,
Segar, C. B.,
Sehl, H. W.,
Seiberling, C. W.,
Semple, Chas. H.,
Sharts, F. F.,
Sherwood, F. W.,
Shilts, W. B.,
Shurtleff, V. T.,
Signer, F. E.,
Simpson, W. B.,
Skinner, John,
Skinner, R. A.,
Skirm, Geo. W.,
Sloane, Chas.,
Slusser, C.,
Smith, Herbert E.,
Smith, C. Monroe,
Smith, Frank B.,
Smith, F. Haskell,
Smith, H. J.,
Smith, H. O.
Smith, H. W.,
Smith, K. D.,
Smith, Mortimer F.,
Smith, P. W.,
Smith, Theodore E.,
Smithman, D. D.,
Sniffen, George W.,
Somerville, A. A.,
Sorrick, Charles,
Spencer-Hess, A. C.,
Spicer, John T.,
Stadelman, Fred,
Stadelman, G. M.,
Stanley, J. R,
Stearns, E.,
Stearns, W. F.,
Stedman, A. W.,
Stedman, A. W., Jr.,
Stedman, C. A.,
Stedman, J. H.,
Stephens, George P.,
Stephens, Wm.,
Sterling, N.,
Stern, Fred,
Stevens, Don,
Stewart, C. H.,
Stiles, Lynn D.,
Stiles, W. H.,
Stimpson, Harold W.,
Stokes, Chas. E.,
Stokes, Robert J.,
Storms, Edgar,
Sturges, L. C.,
Suyematsu, K.
Swain, J. G.,
Swaney, C. R.
Sweeney, Charles W.,
Sweeney, E. C.,
Sweeney, G. R.,
Swett, J. A.,
Switzer, Maurice,
Sydeman, W. H.,

T

Tajima, S.,
Talbott, F. R.,
Tallman, A. V. M.,
Tallmer, A. F.,
Taroff, E. J.,
Taylor, D. L.,
Taylor, Ed.,
Taylor, S. J.,
Teevan, Charles L.,
Teipe, Frank,
Tenney, John, Jr.,
Tenney, William M.,
Terhune, R. A.,
Thoben, Fred H., Jr.,
Thomas, J. W.,
Thomas, L. H.,
Thomas, V. G.,
Thomas, W. J.,
Thomas, W. Y.,
Thompson, C. S.,
Thompson, Jesse,
Thompson, Kennedy M.,
Tiedeman, H. F.,
Tipson, Fred,
Titus, F. E.,
Tobin, Horace B.,
Tompkins, A. G.,
Tonner, Robert L.,
Tower, G. N., Jr.,
Townsend, A. F.,
Townsend, Graham,
Tozier, Edward B.,
Tremont, Harry F.,
Trudeau, P. W.,
Tucker, C. C.,
Tucker, W. H.,
Tufford, J. G.,
Turner, Harold M.,
Turner, M. A.,
Turner, S. J.,
Tuttle, J. C.,
Tweedy, O. S.,
Twombly, E. K.,

U

Utley, Mr.,

V

Vance, Louis T.,
Van Cleaf, J. C,
Van Cleef, F. C.,
Vanderbilt, A. T.,
Vanderbilt, R. L.,
Van Etten, J. de C.,
Van Kleeck, Chester,
Vaughan, L. A.,
Venn, Mr.,
Viall, H. T.,
Vincent, Mr.,
Vinton, A. E.,
Von Schlegell, V.,
Voorhees, Frank D.,
Voorhees, John J.,
Voorhees, John J., Jr.,
Vorhis, Harry S.,

W

Wadbrook, E. E.,
Wagner, Fred,
Wallace, W. B.,
Walsh, Thomas F.,
Walsh, W. C.,
Wanning, F. D.,
Ward, J. H.,
Warner, L. C.,
Warren, A. W.,
Warren, F. A.,
Warren, Harold D.,
Watson, C.,
Watson, John J., Jr.,
Waterman, C. H. T.,
Watts, L. A.,
Weaver, O. L.,
Weber, E. G.,
Weber, Edward,
Weber, Henry C.,
Weber, L. E.,
Webster, A. M.,
Webster, Ed. C.,
Webster, Stuart,
Weddell, J. R.,
Weeks, P. S.,
Weida, H.,
Weigel, Col. W.,
Weitling, W. W.,
Weller, Charles,
Wells, Collin,
Wesley, P. R.,
Weston, Joseph C.,
Westren, J.,
Wetsel, C. R.,
Whalin, Nicholas,
Wheeler, S. M.,
Wherry, H. P.,
White, A. K.,
White, C. M.,
White, Wm. T.,
Whitehead, R. R.,
Whiting, W. W.,
Whitman, R. P.,
Whittaker, William,
Wiegand, W. B.,
Wilkinson, C. A.,
Willennar, W. H.,
Williams, A. W.,
William, C. L.,
Williams, E. S.,
William, F. B.,
Williams, F. L.,
Williams, O. H.,
Williams, Howard H.,
Williamson, C. B.,
Williamson, H. L.,
Willis, R. S.,
Wilson, Harvey,
Wilson, C. Dudley,
Wilson, E. B.,
Wilson, Edgar Hunt,
Wilson, F. R.,
Wilson, J. Alex.,
Wilson, R. S.,
Wilson, W. E.,
Wise, W. B.,
Wisell, W. D.,
Withstandley, V.,
Wolff, George F.,
Wood, Charles E.,
Wood, Le Roy,
Wood, Theodore,
Woodard, H. J.,
Woodard, S. P.,
Woodbury, Ralph B.,
Worthington, H. D.,

Y

Young, Charles T.,
Young, J.,
Young, P. E.,
Young, W. I.,
Young, Mr.,
Yule, G. G.,

Z

Zimmerman, H. J.,

Annual Meeting of The Rubber Association of America.

The fifth annual meeting (under the present charter) of The Rubber Association of America, Inc., was held at the Waldorf-Astoria, New York City, on the afternoon of January 5, 1920.

President Homer E. Sawyer presided. The session was a short one, such formalities as the reading of the call and the minutes of the last meeting, etc., being dispensed with, upon motion from the floor.

There were distributed a printed report of the general manager and secretary, and the financial statement prepared by the treasurer covering the year 1919.

PRESIDENT SAWYER'S REPORT.

In making his report Mr. Sawyer spoke in part as follows:

The principal activity of your president, at least during the past year, has been the endeavor to organize the Association along lines which it quickly became apparent, this year, were necessary. Prior to the war, as we all knew, we were largely a social body, and we had good times, but we did not conduct, between the good times, much business. Our annual banquet and our annual outing were the principal features of the year and in between times we simply attended to our own business and paid little attention to the business of the Association.

CONTINUITY NEEDED IN ASSOCIATION ACTIVITIES.

During the war, under the administration of Mr. Firestone and Mr. Work, everybody worked, and it did not become apparent that the Association as an association was not organized to carry on the regular work of the Association. We have had associated with us, fortunately, as the head of our Traffic Committee our Mr. Viles, and nothwithstanding the fact that the United States Government tried very hard to steal him from us, we finally succeeded, on the first of July last, in installing Mr. Viles, as not only secretary, but general manager of the Association. Since that time I do not hesitate to say that he has done all the president's work. Seriously, however, it was essential that we should so organize as to have continuity in the work of the Association for the future. That there has been some real work done, I know is known to many of you individually. I feel sure that many of you have individually received help and benefit from Mr. Viles' organization. That will be the aim of the Association to provide more efficiently for in the future.

COMMITTEES DOING VALUABLE WORK.

It may be, that in the individual committees there is a feeling that we do not accomplish enough in those divisional committees. I am inclined to think sometimes, however, that the things that some of us would like to accomplish in those divisional committees, the authorities in Washington would frown upon somewhat; and secondly, many things which might be very good for us, from our standpoint, cannot properly be done or undertaken.

The greatest committee, the committee having the largest problem, is naturally the Pneumatic Tire and Truck Division, so ably presided over by Mr. Stadelman and by Mr. Broadwell as vice-chairman. They have done splendid work throughout the year. Aside from the divisional committees there are committees of general character like your Traffic Committee, your Legislative Committee, your Statistical Committee and Industrial Relations Committee. If they alone were all that we could expect from the Rubber Association they would, I believe, warrant all of your support, both moral and financial.

Mr. Viles will a little later speak more specifically regarding his report, and I know that you will excuse the Chair if he closes his remarks simply with a strong plea for your hearty cooperation with your board of directors and with your officers and with your general manager in the coming year.

GENERAL MANAGER VILES' REMARKS.

Amplifying his printed report, Mr. Viles outlined the contemplated work of the Association more in detail, emphasizing the importance of cooperation on the part of members. Said he:

PROMPT OPINIONS FROM MEMBERS HELPFUL

Every communication that is sent out from the Association offices we believe to be of some importance, perhaps not of so great importance to some branch of the industry, but yet of some importance to individual members; and I would like to say it would be very helpful in connection with all communications particularly asking for an expression of opinion to receive a reply from every member. It hampers the work of the divisions to a great extent in the failure to receive, without four or five written letters being sent, replies giving the members' views on various questions of importance.

MOTOR VEHICLE CONFERENCE ON PROPOSED LEGISLATION.

Now, we formed in connection with the Tire Division a motor vehicle conference. That conference is composed of representatives of six associations: The National Automobile Chamber of Commerce, The Motor and Accessories Association, the Three A's, the Trailers, The National Auto Dealers' Association, and the Rubber Association, who have made a contract with the Law Reporting Co. for a report of all legislation that is proposed in each State Legislature throughout the year, that report to be made to the Motor Vehicle Conference immediately after the bill has been printed or typewritten in the various Capitols. Now it is proposed, in that way, to keep an absolute check, and to be in a position to shape policies with respect to all legislation in respect to the automotive industry; and any of the individual members located in the various states can greatly help that service, if they know of any local situation or any municipal situation, or county situation which they believe the weight of the division can help them correct; or if they believe that the Conference Committee's records or the counsel can be of any use to them. So I ask you to give special consideration during the year to any matter coming from the Motor Vehicle Conference through the Tire Division with respect to legislation.

IMPORTANCE OF QUESTIONNAIRES.

Now, you will find a reference here, in the general remarks right next to the last page, to the questionnaire situation. I presume the term "questionnaire" is like castor oil and a lot of other things that have a bad taste to some; but I feel that there is a little misunderstanding, and, perhaps, a little lack of appreciation for the necessity for that sort of thing at this time. The form of the questionnaire has been given a great deal of attention by our Statistical Committee. They believe that the industry not only wants to know its condition in so far as the figures will reflect its condition, but they also feel that in legislative work which is now before us, and the legislation that will come up in the various states and in the coming legislation, that those figures are going to be extremely valuable from a defensive standpoint and if the necessity for them arises, that is, for their immediate use, arises, they are worth 100 per cent more, if we have them right on tap. I feel that for our activities in Washington alone, for the next few years, these statistics are going to be very valuable.

WILL HELP SOLVE TRANSPORTATION PROBLEMS.

In your transportation work, you are facing the most chaotic situation that this country has ever known. I do not feel that the transportation managers of Washington know where they are coming out of the thing. A United States Senator remarked to me a short time ago that there are 98 Senators, and that they have 98 different ideas as to how these railroads are going to be handled, and I think you are going to have 98,000 different propositions with respect to how adjustments should be made and operating service maintained and as to the various other questions that come up within the next two or three years; and you will have situations respecting our industrial work, you will need every ounce of energy, and every bit of cooperation that the Traffic Committee can give; and their work will be augmented to a very large extent if we have the statistics from the questionnaires, so that we can come before any railroad committee or any legislative committee or body acting on railroad matters, with facts, show our position and support it, and get a reasonable measure of justice. I feel that the questionnaire is a vital thing and should have the support of everybody. I do not think that many of you realize what these figures mean when they are all put together, and I further think that a great deal more can be done with them.

TRAFFIC BUREAU READY TO ASSIST MEMBERS.

The Traffic Committee during the year has increased to a committee of 22, starting with only four a little over a year and

a half ago. It represents all parts of the country in which the industry is located, small and large companies and the various branches of the industry. It has performed some very good service; it has saved some very large sums of money and we hope during the year that all managers on transportation problems will keep in touch with the committee, whether small or large or local or individual companies. We are always glad to help. We have organized a very high-class tariff bureau in our office, putting it in position to quote rates and prices regarding service, information regarding claims, and anything of that nature, and we have a man there whom we can send out. If any of you managers want to start a department of your own or want assistance in that department, we have the advice and the information to furnish the basis of an organization and we would be very glad to extend the service to all members of the Association.

MORE INTEREST IN SECURING NEW MEMBERSHIPS.

One other thing I noticed, that we are receiving quite a few applications for membership from comparatively new companies, and our friends the importers are very active in securing these applications. I think they are to be congratulated on their interest in the Association. I would like to see the same or more interest in securing new memberships throughout the Association on the part of the manufacturers. Most of you, perhaps, have some neighbors who may not be members of the Association. Try to find out whether they are or not and bring them to church along with the others.

INDUSTRIAL RELATIONS COMMITTEE ORGANIZATION.

In response to a question by Mr. Hodgman, Mr. Viles explained the plans of the Industrial Relations Committee more in detail. His remarks in this connection follow:

You will find in the report, gentlemen, a reference to the Industrial Relations Committee that has just been formed. Now, that committee is organized somewhat along the lines of the Traffic Committee with an executive committee of ten; and the Executive Committee of the Association has authorized an increase of that committee to 25 so we will have an executive committee of ten and a general committee of fifteen, making a total of 25 people. The committee has been selected with due regard to territorial representation and the size of the various companies, and to the various branches of the work, and we believe it is going to be very successful. The primary purpose is this:

PURPOSE OF THE COMMITTEE.

That the labor situation is entirely different than it was in what we might term normal times. It is not believed by many, large numbers of our people, manufacturers, that the country will ever get back to the labor conditions of the past. Labor has taken a new stand for better conditions; they have new viewpoints in a conception of their own rights and duties, and the manufacturer has necessarily, even if he would not—there not having been time to attempt to form a policy—he has had to meet the situation. And we think that the Industrial Relations Committee, having analyzed the various methods used in selecting the employes and deciding as to employes' privileges and the conditions under which they shall work; in fact, the whole employment relation, by an analysis of the various methods used by all members, can select from that mass of information, the best points to all of them and assemble them into one composite system and put them out for your consideration. That is one thing.

PLAN OF ACTION.

We purpose to keep in touch, through a service somewhat similar to that of our Tire Division, with all proposed labor legislation and it is to be given to you as a matter of information. The Industrial Relations Committee would be glad to receive expressions regarding, we might say, suggestions of all kinds; in fact, at each meeting we will prepare a docket and all members of the Association will be asked to suggest subjects which this committee can consider, such information as they can gather or suggestions which they can make to them. There is nothing in their work of a paternalistic nature, nor will they tell you you must do something, nor will they ask you to do anything in any peremptory way; they will simply go to you as a matter of getting or giving advice. And this advice we hope will be of great benefit to you.

INDUSTRIAL RELATIONS NEED MORE ATTENTION.

Touching upon the intention of the Board of Directors to enlarge the various committees in order to ensure wider territorial representation and to embrace large, medium and small manufacturers, the president further emphasized the need of devoting more attention to the matter of better industrial relations:

We all agree that not only is there the necessity of more attention to the question of industrial relations, but we want to give a greater attention to it. The day, we believe, has gone by when we can simply flatter ourselves that our own house is in order, and that, consequently, we are safe. Some of us, instead of using the words "Capital and Labor" have chosen to use the words "Management and Employes." And certainly I feel that management and employes must establish much more intimate points of contact in the future than in the past. And as I said a moment ago it is not sufficient for us to smugly assume that our industrial relations are good with our employes, because the disease or a contagion of bad relations between management and employe in our immediate vicinity, even if it is not in connection with our own industry, can easily spread into our own better managed companies to the detriment of our companies. I do not think there is anything that business men or public spirited men in any walk of life can turn their attention to with a greater sincerity of purpose and open mindedness and a real heartiness than to try to improve industrial relations conditions in this country of ours. Some of the larger companies have selected during the past three or four years specialists in that line of work. Some of the smaller companies have already done so, and as fast as the Association finds that any company has a specialist in that line that has something helpful to bring to their gathering, he may be sure he will be asked to come along with his ideas and his suggestions.

ELECTION OF NEW DIRECTORS.

The names of the gentlemen placed before the membership by the Nominating Committee for election as directors, for three years from January, 1920, were, upon motion from the floor, presented for a vote and the nominees were unanimously elected. Their names follow: A. H. Brown, J. S. Broughton, J. W. Maguire, W. O. Rutherford and H. E. Sawyer.

Formal action was taken, requesting the Board of Directors to continue the work undertaken and in contemplation in connection with the gathering of statistics through the medium of questionnaires, as the opinion was expressed that the work is valuable and its results would prove of much service in the future.

AMENDMENTS TO THE CONSTITUTION AND BY-LAWS.

Suggested amendments to the Constitution and By-laws were formally adopted, the intent of which is stated in the following:

> First: The providing of more definite and specific conditions under which firms, corporations or individuals, not directly engaged in the rubber industry may participate in the activities of The Rubber Association of America, Inc. The suggested amendments include certain limitation of voting power and different annual membership dues. They also provide that those firms, corporations or individuals not directly engaged in the rubber industry, which are now members of the Association, shall automatically upon the adoption of the suggested amendments become affiliated members.
>
> Second: Specific provision to the effect that membership in the Rubber Association is not transferable from one firm, corporation or individual to another under any conditions.
>
> Third: Specific provision to the effect that membership in the Association will be for the calender year instead of for a year from the first of the month following election.

ELECTION OF OFFICERS.

Immediately following the general meeting, the Board of Directors met and the officers of the Association during the year 1920 were unanimously reelected to serve during 1920 as follows: President, Homer E. Sawyer; first vice-president, Harry T. Dunn; second vice president, F. A. Seiberling; general manager and secretary, A. L. Viles; treasurer, W. C. Cox.

W. J. Kelly and J. S. Broughton were elected to serve on the Executive Committee for the coming year and the Board appointed a Legislative Committee to consist of General Counsel, Charles Neave, F. C. Van Cleef and Ernest Hopkinson, but the appointment of the remaining standing committees of the Association was referred to the Executive Committee with power to act.

Officials and Directors of Rubber Association of America, 1920.


J. S. Lowman.


J. S. Broughton.


S. G. Lewis.


J. Morgan.


W. O. Rutherford.


Harry T. Dunn.
First Vice-President.


Homer E. Sawyer.
President.


Frank A. Seiberling.
Second Vice-President.


J. A. Maguire.


A. L. Viles.
General Manager and Secretary.


William C. Cox.
Treasurer.


(Underwood & Underwood, N. Y.)
W. J. Kelly.


J. N. Gunn.


A. D. Thornton.


(Underwood & Underwood, N. Y.)
C. W. MacLaughlin.


C. J. Davol.

Portrait of A. H. Brown, a director, not available.

REPORT OF THE GENERAL MANAGER AND SECRETARY.

The change in the management of The Rubber Association of America, brought about by the creation of the dual position of general manager and secretary on July 1, 1919, presented many difficulties with respect to the preparation of the Annual Year Book, particularly because of the general manager's lack of personal connection with or knowledge of the War Service Committee just prior to its dissolution and the reconstruction plans undertaken following that event. Also the labor troubles which paralyzed the printing industry in New York City were of such a protracted nature that it was concluded that the publication of the Year Book was decidedly impracticable.

For these reasons a large 8-page printed report of the general manager and secretary was distributed to all Association members in lieu of the Year Book, which will probably be issued not later than three months following the annual meeting. The printed report is a welcome innovation, giving as it does a summary of the Association work for the year 1919, as it has been detailed monthly in The India Rubber World, presenting a comprehensive view of the work of the various divisions and committees, outlining somewhat the plan of action for the present year, and emphasizing the need of co-operation on the part of members to make it a success.

DIVISIONS' MEETINGS.

Meetings of the following divisions were held on January 5, 6 and 7, 1920, and officers elected for the ensuing year:

Boots and Shoes Division.—The Boots and Shoes Division met at the Union League Club for lunch on Monday, January 5, and the business of particular interest was the adoption of by-laws and the change of the name of the division from "Boots and Shoes Division" to "Footwear Division."

Foreign Trade Division.—The Foreign Trade Division held its meeting at the Yale Club, January 5, seventeen companies being represented, and officers and an executive committee were elected as follows: chairman, A. R. Gormully, Ajax Rubber Co., Inc.; vice-chairman, A. W. Magee, Kelly-Springfield Tire Co.; G. C. Chalmers, Hodgman Rubber Co.; R. H. Daniels, The Goodyear Tire & Rubber Co.; A. A. Garthwaite, Lee Rubber & Tire Corporation; A. S. Hardy, Manhattan Rubber Mfg. Co.; E. H. Huxley, United States Rubber Export Co., Ltd.

It was determined that the Executive Committee would hold regular monthly meetings at the offices of the Association.

A sub-committee was appointed to confer with the Federal Trade Commission at Washington regarding the interpretation of the Webb-Pomerene Act and to present facts and arguments, if necessary, in support of the views of the Foreign Trade Division respecting the needs of the rubber industry in this connection.

Mechanical Rubber Goods Manufacturers' Division.—This division met at the Yale Club January 5. John J. Voorhees, Sr., was unanimously reelected chairman of the division and C. E. Cook was elected vice-chairman.

A departure from the previous organization plan was determined upon to the extent of having four vice-chairmen, one for each of the districts in which the manufacture of mechanical rubber goods is somewhat centralized, i.e., New York, New England, New Jersey and the Middle West. The election of the three other vice-chairmen, however, was referred to the Executive Committee with power, following the amendment of the by-laws of the division, to provide therefor.

Rubber Proofers' Division.—The Rubber Proofers' Division met also at the Yale Club, January 5. The following were elected to office and to membership on the Executive Committee: chairman, Dr. L. C. Himebaugh; vice-chairman, Warren McPherson; Executive Committee: chairman, Dr. L. C. Himebaugh; vice-chairman, Warren MacPherson; J. J. Clifford, Frank Post, J. T. Callahan.

The Publicity Committee to act during the year was appointed, consisting of James Meade, W. E. Cavanagh and W. Keyes.

Certain routine matters, particularly in connection with the uniform contract which is being developed by the division, were handled.

Reclaimers' Division.—The Reclaimers' Divison met at the Yale Club, January 5, and the officers and members of the Executive Committee who served during the year were unanimously reelected as follows: chairman, E. H. Appleton; vice-chairman, Clark W. Harrison; Executive Committee: E. A. Andersen, John S. Clapp, R. A. Low, J. S. Lowman, Joseph F. McLean.

The Technical Committee, as constituted for the year 1919, with the exception of Dr. L. E. Weber, exofficio member, was reappointed as follows: Chairman, L. J. Plumb, W. B. Pratt, C. J. Howell, T. E. Furness, Joseph E. Russell.

Certain details in connection with the specifications for the standards and packing of scrap rubber, which are promulgated by the Division, were given attention.

Rubber Clothing Manufacturers' Division.—This Division met on Tuesday, January 6, in the office of the Rubber Association, and officers and an executive committee for the year 1920 were elected as follows: chairman, N. Lincoln Greene; vice-chairman, A. W. Warren; Executive Committee: N. Lincoln Greene, A. W. Warren, C. Kenyon, W. M. Tenney, G. H. Rockwell, J. T. Callahan.

A number of subjects involving matters of a routine nature were given attention.

Rubber Sundries Manufacturers' Division.—The Executive Committee of this division met at the Union League Club for dinner on the evening of Tuesday, January 6, and the Division met at a general meeting for lunch at noon on the following day. C. J. Davol and H. A. Bauman, who served during 1919 as chairman and vice-chairman, respectively, were unanimously reelected, and an executive committee, consisting of the following named, was elected: chairman, G. J. Davol; vice-chairman, H. A. Bauman; Executive Committee, W. S. Davison, S. H. Jones, W. H. Balch, E. E. Huber, A. W. Warren.

Tire Manufacturers' Division.—The Joint Executive Tire Committee met in the Association Rooms, January 7, and gave its attention to several subjects of interest and importance, and then adjourned to attend the general meeting of the Tire Division with luncheon at the Yale Club. There were forty-eight in attendance at this meeting.

Following luncheon the meeting was formally convened with A. G. Partridge, vice-president of the Firestone Tire & Rubber Co., in the chair.

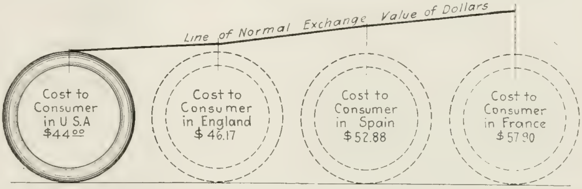
A resolution was passed, dissolving the Solid Tire Manufacturers' Division in order that it might amalgamate with the Pneumatic Tire Manufacturers' Division because of the interests of the two being substantially identical and the membership of the Pneumatic Tire Manufacturers' Division so greatly exceeding that of the Solid Tire Manufacturers' Division. The name of the Pneumatic Tire Manufacturers' Division was changed by resolution to "Tire Manufacturers' Division" and a sub-committee is to redraft the by-laws so as to provide for the interests of all tire manufacturers.

John Kearns, of the Lee Rubber & Tire Co., was elected chairman; Seneca G. Lewis, of the Pennsylvania Rubber Co., was elected vice-chairman. The division has an executive committee of fifteen and the following firms were elected to membership thereon for the year 1920: Ajax Rubber Co., Inc., Empire Tire & Rubber Co., Firestone Tire & Rubber Co., Fisk Rubber Co., The General Rubber Co., The B. F. Goodrich Co., The Goodyear Tire & Rubber Co., Hood Rubber Co., Kelly-Springfield Tire Co., The Miller Rubber Co., Norwark Tire & Rubber Co., The Portage Rubber Co., Swinehart Tire & Rubber Co., United States Rubber Co., Victor Rubber Co.

Influence of Present Exchange Situation on Competitive Position of American Rubber Industry in Foreign Fields.

By L. W. Alwyn-Schmidt.

The recent decline in the exchange upon America has resulted in a considerable disorganization of American foreign trade which has found its principal expression in a general disinclination of American exporters to accept anything but dollars in payment. It is now argued that the pesent situation if left to continue, is likely to lead to a general breakdown of our export trade, as foreign countries will hardly be inclined to buy American merchandise upon the basis of the present exchange rate as against the high price of the dollar. Exporters of rubber tires and other rubber goods have received many cancellations of foreign orders during the last months and are inclined to attribute this condition exclusively to the exchange situation. They hold that the American rubber industry is in danger of becoming incompetitive in the international field. Several remedies have been proposed; so far, however, no action has been taken, principally because of the lack of a basis upon which a settlement can be obtained.

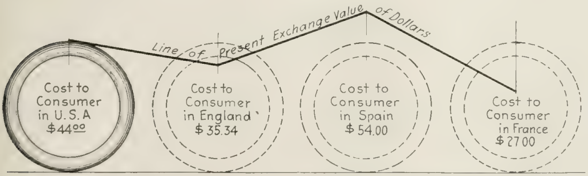


Prices of Tires Corresponding to the American 34 by 4½-inch Fabric Tire in England, Spain and France, with United States Money Equivalent at Normal Exchange Rates.

TIRES AND EXCHANGE RATES.

It will be shown in the following that the situation is by no means as serious as it appears on the surface, and that its disastrous effects upon international trade are not caused by the devaluation of foreign money itself but by the present frequent fluctuations of the market.

The situation most frequently quoted is that of an American manufacturer, say one making tires, negotiating for a tire contract in France or England. Let us assume the tire to be a 34 by 4½-inch fabric tire, of standard make and costing the consumer $44 in the United States. This tire costs to-day in France 300 francs. It costs £9.10 in England, 274 pesetas in Spain, and approximately $37.80 United States currency in South America. Applying normal exchange, the dollar value of this tire would be $57.90 in francs, $46.17 in England, and $52.88, approximately, in Spain. The normal exchange rate of the pound sterling is $4.86, of the franc 19 cents, and of the peseta 19 cents. On the day of writing this article, December 19, the following quotations were made in international dollar exchange: pound sterling $3.72, franc $0.09, peseta $0.191. If purchased in dollars, a tire equivalent to the American one could have been bought in England for $35.34, in France for $27, and in Spain for $54, approximately, owing to a fractional increase of the cost of the peseta over par. On the other hand, the English purchaser of an American tire would have to pay £11.18.—the French 484.88 francs, and the Spanish 270 pesetas, approximately. We have therefore, at the present time at least, the peculiar situation that one and the same tire can be purchased and sold at varying rates in each of these countries owing to the variation of the exchange.



Prices of Tires Corresponding to the American 34 by 4½-inch Fabric Tire in England, Spain and France, with United States Money Equivalent at Present Exchange Rates.

Such a situation can act on the American tire trade in two different ways. It might enable tire importers in this country to purchase for dollars great quantities of tires in England or France and to sell them here at a cost very much below that for which they can be offered by other manufacturers. But it will also deter the French and English purchaser from buying tires in the United States at the practically preventive exchange rates of their respective money units existing just now. Also there is a third consideration: to which country will the world's markets go for supplies in the present situation, to the United States, to France or to England? But the present-day situation is only an incident of the overshadowing problem of international competitive ability of which it forms a part.

COMPETITION IN PRODUCTION.

The exceptional demand for rubber goods from domestic and foreign markets during the last years has put out of operation the ordinary rules of competition that govern the world's market in normal times. Goods were needed urgently and cost was no consideration. Under these conditions there was no difficulty for any manufacturer to sell at his own prices. It was a typical sellers' market with no string to it in any respect. But the conditions must change again, in fact they have already changed. The world's business can not be conducted permanently on a war basis, and after a while the rules of ordinary competition will return. The United States rubber industry will then find very strong competition from unexpected quarters. We know little yet about the actual conditions in Europe. The European rubber industry has operated during the war under high pressure. Rubber has generally come more into prominence, and the experience and knowledge of the war applied to modern manufacturing

should give very effective support to the European rubber industry.

Competitive production is not only a matter of manufacturing method; it goes right down to the very roots of the industry. The ability to compete springs from the volume of the original investment, of the productive capacity and cost of labor and from the effectiveness of the equipment. It depends upon the price of the raw material and the overhead expenses of the industry. We can, therefore, easily concede points to Europe for new inventions and improvements in the method of the industry if we can only meet competition as to the cost of labor, materials and the general operation of our plants.

If it should prove that we pay more for our raw materials, that our labor costs us more than it costs the European manufacturer and that our overhead expenses are higher, then we may very well experience a severe set-back in the prospects of our industry. Europe will not only take away from us our recently gained export markets but it also may attack us in the domestic market.

CRUDE RUBBER AND FOREIGN EXCHANGE.

There is little reason to expect that European rubber manufacturers should be able to buy their rubber much cheaper than our own manufacturers. The American rubber manufacturer has bought rubber as cheaply in London as the English in pre-war times and the freight has not made much difference in the cost of the product at the door of the factory. During the war this condition has still more improved as we have discontinued largely the old practice of buying in Europe but have purchased and shipped our requirements at the source. The cost of the raw material, therefore, will not favor in future any side any more than it has in the past, and the chances are even that the scale may dip slightly in our favor.

This chance is supplied by the present exchange situation. As neither France, nor England, nor the United States, is able to produce rubber in their respective countries, they must necessarily buy it somewhere else, in Brazil, Africa, or Singapore, for example. In these markets each of the purchasers appear on his own merits. But the American purchaser, at least at the present time, has the advantage of the greater purchasing power of the dollar. Where the English manufacturer still pays twenty shillings to the pound sterling, the American pays only $3.72 which gives him a superiority of approximately 20 per cent in his purchase.

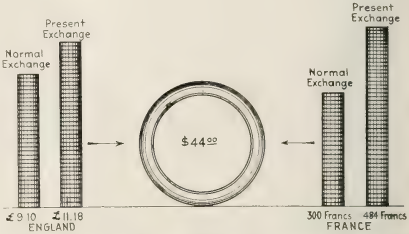
OTHER SUPPLIES.

What applies to the principal product, applies also to the supplementary ones, as the textile fabric in the tires, chemicals, etc. The rise in the cost of many of these has been quite phenomenal. These supplementary supplies are not so narrowly confined to their original sources as rubber. Of course, for the fine cotton required for tire fabrics we rely almost exclusively on Egyptian cotton, as the Sea Island product is not at present available in sufficient quantities. But it appears that we should be able to purchase this cotton as cheaply or expensively as our European competitors. Our position as to chemicals probably is less favorable. England, France, and our other European competitors have manufactured these products generally cheaper than our own factories, and they most likely will continue to do so. It may be said that we can purchase these products from them, and by doing so can share in their advantageous position. But since the war much has changed in our own chemical industry, and it may become a matter of good policy that we should favor rather our national producers instead of the foreign, even if we should have to pay a higher price. After all is said, there remains, however, the fact that matters will remain practically unchanged and that the advantage in buying will remain pretty much where it was before the war.

Conditions are different as to labor. In this respect we have to deal in Europe with three distinct groups of production, each having its special problems of labor, and each being differently affected by the recent reorientation.

LABOR SITUATION.

In England and France little has changed in the outward position of labor. True, it has increased its political control in the first-named country, but the English workingman has always exerted a certain influence upon the industry of the country by



It is an Expensive Matter for the Purchaser to Buy an American 34 by 4½-inch Fabric Tire with the Depreciated Money of England and France.

way of a very well developed system of trade unions. Conditions are similar in most of the neutral countries and in Italy. In Germany, however, great changes have taken place and are still under way. The German working population is not only taking part now in the management of the political affairs of the nation but it has become the government itself. The change has not been always to the best interest of the industry of that country but the outlook is rather hopeful and in the end a fairly sound system of cooperation between manufacturer and workman may be obtained. Nothing has yet been decided as to the status of labor in the newly created republics east of Germany, such as Poland and Bohemia, while in Russia proper at the present time labor has not only control of the governmental machine but has taken in charge the whole nation. This growth of the political influence of labor has been followed in each instacne by a rise in wages and it is this aspect of the situation which is of most importance for the future competitive position of the European rubber industry.

WAGE INCREASES.

Wage increases have varied a great deal in the different parts of Europe. In England wages have gone up at rates varying between 75 and 100 per cent. Wage increases, however, have been generally more heavy on the European continent because wages were lower there than the average wage scales paid in England. In France, for instance, the rubber industry now pays easily 150 per cent more than it used to pay in pre-war days, and in Germany increases have been as high as 200 per cent and even more. Conditions in Germany are very unsettled and the present wage movement has not come to an end yet, owing to the continual depreciation of the German exchange. We may take it, however, for granted that continental European wages in the rubber industry will settle down finally upon approximately the same level as that prevailing at the present time in England. This will bring about a great change in the competitive situation in Europe.

In pre-war times it was generally acknowledged that the continental European factories were able to out sell the English ones in their own market. As the result there existed in London a great number of European continental agencies selling the product of their respective factories in competition with English manufacturers. During the war, a noticeable reduction in the number of these agencies has taken place and their return in the same strength is not expected. England in fact may be able to hold

very well its own market against foreign competition. But the increase in wages has also changed the competitive position of Europe as a whole in its relation to the non-European markets. The European rubber industry has done an enormous non-European trade in former years, based principally upon its ability to sell at low cost. The European manufacturer had only little in his favor in the purchase of raw materials, his chances to sell cheaply, practically speaking, rested entirely on his possibility of getting his work done at a low wage scale. On the strength of the cheaper European labor the European rubber manufacturer, therefore, was enabled to undersell his American competitor practically wherever they met in the world.

Of course, while European wages have risen, there has also taken place a considerable increase in the wages paid by our rubber manufacturers. The question now is: Have these American wage increases outdistanced the European and have they reestablished in this manner the same difference in the cost of labor in favor of the European rubber manufacturer that existed before the war? American wages in the rubber industry have grown exactly 100 per cent since the summer of 1914. But the chances are that the American wage movement has now reached its highest peak. When the end of the movement has been reached it will most probably show that American wages are still higher than the European wage scale but that the European scale is approaching more closely our own than was the case before the war. Our handicap would no more, therefore, be as extensive as it has been in former years and we might very well aspire to overcome it by making reductions in our overhead expense, a procedure in which we have acquired much experience.

OVERHEAD EXPENSES.

Overhead expenses in the rubber industry are comparatively high. They comprise approximately 25 per cent of the sales price of the ready product at the factory door. Like all other forms of manufacturing expenditure they have grown considerably during the last year in this country but they have still grown more rapidly in Europe. In comparison with the heavy war expenditures of the European countries ours have been small. True, we have lent heavily to our associates in the war but we must assume that these debts will be repaid one day. We also have followed the very wise procedure of clearing up a great mass of expenses by the medium of immediate taxation that will relieve our industry from further heavy increases in this respect after once the present period of high taxation has ended. But while we seem, therefore, to be well placed as far as direct overhead expenses are concerned, it is doubtful whether we can claim the same as regards indirect overhead expenditure. It is up to every rubber factory to correct a faulty expense system and to make economies of one or the other sort. It will in doing so certainly reduce the cost of production and will keep its goods competitive in the international market. But the individual rubber manufacturer has no influence upon the more dangerous form of overhead expenses which derive their origin from national sources. These overhead expenditures, as railroad freights, shipping freights, and others, have to be met by each manufacturer as an unalterable quantity. They affect his business as much as that of his competitor, of course, but their growth or decline upon a national basis is of considerable influence upon the standing of a whole industry when entering international competition. Of this national overhead the rubber industry of the United States has had to carry lately a more than usual burden which has been increased still further by a rather pernicious system of intentional restraint of production.

It is this form of expense increase which is at present the most serious charge upon our national cost of production and which forms a great danger to the competitive position of our rubber industry. We have, therefore, so far established the following facts:

The purchase price of a French or English tire, if bought with American money, has declined.

The purchase price of an American tire, if bought with French or English money, has increased.

The price of an American tire in Europe, therefore, has reached at the present moment a level that renders it incompetitive, while a French or English tire can be sold much cheaper in the United States than an equivalent American tire.

In the language of the economist: a point has been reached where the export of rubber products becomes unprofitable in our market, as its purchasing value for other goods has declined. But this adverse condition must pass very soon. French and English exchanges have declined not only in the direction of the United States. They have also shown a considerable decline in other directions. In these markets the purchasing value of French and English money is lower than that of the dollar which has remained approximately at par. This devolpment has already resulted in a purchasing movement in favor of the two countries for such merchandize as is manufactured exclusively inside England or France. But the lower exchange operates in this instance very heavily against the selling country, as it reduces materially the avaliable funds for exchange purchases. The raw materials bought by either France or England in exchange for industrial products cost these two countries not the price of the normal exchange, but the additional cost caused by loss of exchange.

THE REMEDY.

To meet this situation these countries will have to raise their prices to a point where it becomes profitable to them to sell their merchandise in exchange of the foreign product. This step has been taken already in many instances as indicated by the rapid rise in the cost of many raw materials and manufactures which we import ourselves from the countries in question. The time has come, then, when the real test of comparative competitive ability applies. To which point will England have to raise its tire prices so as to meet the demands of labor, cost of materials, overhead, and essential manufacturing profit? Will this bring the cost of its tires to a level considerably higher than that at which the same tire can be supplied by the United States? The chances are that the weight of the heavy national overhead expenses of Europe and the enormous loss in purchasing power caused by the devaluation of its money will favor the United States producer.

This answers also the present problem. We can not expect European exchange to rectify itself as rapidly as has been the case after other wars. The burden is too great to be borne easily. But a stabilization will be attempted that will remove the principal disadvantage of the present situation—that of the permanent changes in the market quotation of foreign moneys and the general disorganization of all international trading resulting from it. If we know the franc will buy 10 cents worth of our merchandise or of raw materials of other countries, we can sell and buy upon this basis. After a while all trading will readjust itself accordingly and competition will not depend upon the varying chances of the money situation but upon the ability to produce at a competitive price. There will be no handicap and no favor. Under such conditions the American rubber industry should be well able to prosper in its foreign dealings.

AN ITALO-AMERICAN ASSOCIATION FORMED.

A *Unione Italo-Americana* has been formed recently in Rome. It is intended as a center for all Italo-American committees and has several sections—economic, intellectual, art, legislative, publicity. It is supported by financial establishments and business men who wish to foster the commercial and economic relations between the two countries, and seek from the United States in some degree the backing which Italian industries and commerce received from Germany before the war.

The Association is housed in the Palazzo Salviati on the Corso Umberto, and has set up an information office for American business men, a library of American industries, and a general meeting place for business and social purposes.

Cotton Bonanza in the Southwest.

Tales of the cotton crops in southern California and Arizona begin to rival those of the early gold discoveries. When the United States went to war every effort was made to induce the planters to increase their acreage in anticipation of a long and protracted struggle, and now the results are beginning to show in the prediction that this year the net yield to the growers in this section will be in the vicinity of $40,000,000.

When it is considered that this addition to the wealth of the country is gained mostly from sections which were formerly considered waste and unprofitable lands the achievement from a financial standpoint seems all the more remarkable. Regions in California previously considered prosperous have been made more so while desert spaces of Arizona have been made to yield from $150 an acre upwards. Families that several months ago were living from hand to mouth and were barely able to rent land on a crop basis are now riding round in automobiles, according to reports from these districts.

Altogether more than 177,800 acres are planted to cotton in southern California and Arizona. In Imperial Valley 67,816 acres are planted on the American side of the line and 60,000 acres are planted on the Mexican side, yielding from half to three-quarters of a bale per acre. Prices for 100,000 bales produced the past year in Imperial Valley are said to have ranged from 35 cents to 55 cents a pound. These record prices, the result of a shortage of cotton throughout the South, have so enthused the valley that the planters are already figuring on a further increase of cotton acreage. As to the grade of the cotton produced, this can best be illustrated by the market reports. When the December delivery in the New Orleans market was quoted at 38 cents a pound, the price of the Imperial Valley product was 53 cents, a premium for quality of 15 cents a pound.

As an illustration of the growth of the industry in Imperial Valley, arrivals of 50 cars a day at Calexico, the cotton center of the valley, are not infrequent. On the first of November the

Gin-Yard at Calexico, California.

average daily receipts of cars at Calexico and Mexicali is around 15 cars, but this gradually creeps up and the high point is during the month of December. These cars are handled by the Inter-California railroad. A typical day's business last fall was the occasion when forty-nine cars arrived, seventeen of which were from across the line and twelve were consigned to one gin, ten being from this side of the line coming into Calexico and the remaining 22 being direct from Mexicali. A much larger number of carloads were picked in the valley that day, but gins at El Centro, Imperial, Brawley and Holtville took their share. Of the approximately 25 gins in the valley, by far the larger number are located at Calexico and Mexicali.

These two towns are unique, in that they are the only places in the United States where cotton is received in carload lots for ginning. The gins in the South are scattered through the cotton raising section and are more numerous, but the cotton is invariably hauled in wagons from the field to the gins. Ten carloads of seed a day are brought across the line, some of it being compressed in Calexico, but the bulk of it going to oil mills in Los Angeles. Some of it is shipped to Texas, also for compress.

Sacking Arizona Cotton.

Imperial Valley cotton seed is always in demand at high prices as oil mill men who buy for its oil content say it is richer in oil than any grown elsewhere in the United States. A large amount is shipped east to points where the crop is poor and is there replanted, even growers in the South recognizing it as superior to any produced in even the best cotton-growing sections.

Pima or Egyptian cotton has come into favor in a few sections of the valley, and it commands a price of from 55 to 85 cents a pound, but it is very difficult to gin properly. The gin at Seeley is said to be the only one adapted to handling this kind of cotton. The variety generally grown is the Durango or medium long staple variety, which made its way several years ago from Mexico where plants were growing along the ancient ditch banks and canal beds. This cotton attained its highest state of maturity in the Imperial Valley and is widely cultivated. Seven thousand acres were planted to Pima or Egyptian long-staple cotton last year, but because of the market, which has not yet become fully developed, the growers experienced difficulty in getting the price they anticipated and the acreage dropped this year to 5,000.

Imperial Valley has been entirely free of labor difficulties the past year. On the American side of the line the pickers have received $2 a hundred, averaging $4 a day and up, and on the Mexican side Chinese laborers who picked the crop averaged $1.40 a hundred. Cotton insect pests are rare, but one, the "leaf miner," being heard of to any extent. The best remedy for this is to plant early and to pick as soon as possible. The insect does not get started until late and does no particular damage if the cotton is handled in this manner.

Palo Verde cotton acreages for the last five years have been: in 1915, 1,700; in 1916, 4,800; in 1917, 7,000; in 1918, 12,700, and this last year 20,000, representing a growth in aggregate crop values each year from a few thousand dollars to over $5,000,000. Crop conditions published in the government reports in November, 1919, including up to October 25, show the average condition of

the cotton crop in the United States to be 51.1 per cent of normal, while Arizona was 89 per cent and California 92.

The cotton situation in Arizona is highly gratifying to growers because of high prices, the comparatively cheap cost of producing and harvesting, and the continued steady demand for the product. Begun a few years ago as an experiment, the acreage has gradually increased until in 1916 there were 20,000 acres in this state devoted to raising this staple. The acreage of 1919 upon which "long staple" was produced was estimated as in excess of 50,000, the return to the growers being figured at between $18,000,000 and $20,000,000. The December cotton reached the extraordinary high figure of 85 cents a pound and producers believe it will go even higher. It is said to exceed in length, texture and fiber the famous Egyptian and Sea Island varieties, and is the kind most in demand in the commercial markets of the world.

It should be remembered that long-staple cotton is the most desirable for fabric and cord for automobile tires. Perhaps one of the greatest advantages that has accrued to Arizona as a result of the cotton crop is the stimulating effect it has had upon land values. Land which two years ago could have been purchased for $25 an acre is now selling for ten times that figure and that for which $150 an acre was the top price now commands $500 an acre. The latter figure is set by present owners on large tracts formerly devoted to raising alfalfa. Good cotton land can be rented for $50 an acre.

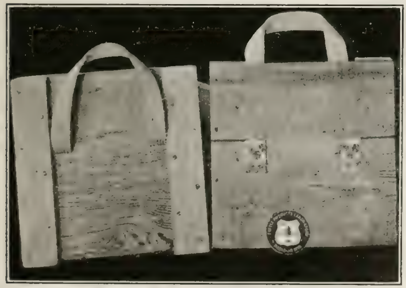
The Southwest Cotton Co., the county farm bureaus and the Federal Department of Farm Industry have combined to help the growers and encourage increased acreages. Every effort is being made by these agencies to propagate new varieties of cotton, to fight against the introduction of the boll weevil and other pests, and to introduce the best kind of machinery.

On the new desert lands the yield has been from ¼ to ½-bale per acre and on developed lands 1 to 1½ bales. Each bale weighs 500 pounds, which, at 85 cents a pound, means each is worth $425. There are no gins in the Salt River Valley for handling short-staple cotton.

RUBBERIZED WEBBING HANDLES FOR BOXES?

As a suggestion, rubber manufacturers may be interested in the box handles of webbing devised by the United States Forest Products Laboratory, Madison, Wisconsin, to eliminate the use of rope handles that take up valuable shipping space.

To obviate these difficulties, a webbing about ⅛-inch thick and 1⅛-inches wide, which has a breaking strength of 800 pounds,



(Forest Products Laboratory.)

METHOD OF ATTACHING WEBBING HANDLES TO BOXES.

is suggested. This may be inserted through saw-cuts made parallel to the grain in the ends of the box, turned down flat inside, and nailed securely with large-headed roofing nails.

Such a handle takes up no extra space either inside or outside of the box. It is easily made, and has a lifting strength with a large margin of safety.

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered, nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

(770.) A request has been received for the addresses of manufacturers of endless gray air bags.

(771.) A manufacturer requests the addresses of manufacturers of aluminum bronze powder.

(772.) Inquiry is made for the address of manufacturers or licensees of tire-engraving machines.

(773.) A subscriber requests the addresses of manufacturers of varnish to apply to proofed raincoat fabrics to produce a leatherette effect.

(774.) The manager of a production department asks if there is an organization for production managers which specializes on the tire and rubber industry.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Request for each address should be on a separate sheet, and state number.

DISTRICT OFFICES.

New York: 734 Customhouse.
Boston: 1801 Customhouse.
Chicago: 504 Federal Building.
St. Louis: 402 Third National Bank Building.
New Orleans: 1020 Hibernia Bank Building.
San Francisco: 307 Customhouse.
Seattle: 848 Henry Building.

COOPERATIVE OFFICES.

Cleveland: Chamber of Commerce.
Cincinnati: Chamber of Commerce.
General Freight Agent, Southern Railway, 96 Ingalls Building.
Los Angeles: Chamber of Commerce.
Philadelphia: Chamber of Commerce.
Portland, Oregon: Chamber of Commerce.
Dayton, Ohio: Dayton Chamber of Commerce.

(31,625.) A firm in Spain wishes catalogs and price lists of automobile accessories and tires with a view to securing exclusive agencies. Correspondence and catalogs may be in English, but Spanish preferred.

(31,627.) A man in Brazil wishes to buy machinery for the manufacture of rubber articles. Quotations c. i. f. Brazilian port. Correspondence may be in Portuguese or Spanish. Catalogs and price lists requested.

(31,653.) American trading company with branches in the Netherlands, Germany and France, wishes an agency for automobile sundries, tires, etc.

(31,666.) A firm of contractors in Germany wishes to represent American firms for the sale of rubber.

(31,689.) Manufacturers in Spain wish sole agency on commission for the sale of belting, rubber goods, etc. Correspondence in Spanish.

(31,730.) A trading company in the Netherlands wishes an agency for the sale of raincoats. Quotations c. i. f. Rotterdam. Cash against documents.

(31,734.) A firm in Australia wishes to secure an agency for the sale of oilskin suits, coats, leggings, mackintoshes, motorcycle suits and capes, and kindred goods. Quote c. i. f. Australian port. Payment by 30 days' sight draft.

(31,774). A firm in New Zealand desires to purchase and to secure an agency for high grade motor tires.

(31,814.) An American firm with branches in Egypt and Greece wishes agencies for the sale in the Levant of automobile tires. Quote f. a. s. Payment in New York.

(31,822.) A merchant in the British West Indies wishes to buy men's and women's cheap white canvas rubber-soled shoes.

The Manufacture of Elastic Fabrics.

One of the oldest of rubber products is elastic webbing. It is also one that is but rarely described. The European looms since 1914, were transferred from elastic webbing containing rubber thread to plain cotton webs for military use. American factories were therefore called upon to furnish the world's supply. The foreign demand still continues, hence the timeliness of this article.

ELASTIC FABRIC FROM RAW RUBBER.

NEARLY TEN YEARS before Goodyear's discovery of vulcanization, india rubber was used in the making of elastic fabrics. A factory in America and another in France produced quantities of these goods. The process was cutting balls of fine Pará rubber in halves and pressing the halves out flat. From these, long, wide strips were cut by a circular knife, the strips being skived at the ends, and stuck together by hammering on an anvil. The wide strips were then cut into threads by a slitting machine, the threads being wound on reels, and left for a period of six weeks to harden. The weaving of this rubber thread into the fabric was first done on hand looms, the rubber being stretched as much as it would stand. Then the final touch was given to impart elasticity to the fabrics. This was accomplished by moistening the fabric, and running a heated iron over it, which process steamed and softened the outer covering, and allowed the stretched rubber to shrink to about two-thirds of its former length. This drew the woven covering with it and rendered the fabric somewhat elastic.

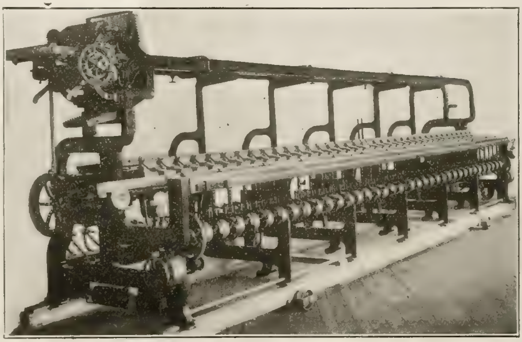


FIG. 1.—CROMPTON-KNOWLES SUSPENDER LOOM.

EARLY INVENTIONS.

Goodyear and other early inventors, after the year 1840, spent much time in experiments along the same lines, using sheets of vulcanized rubber instead of threads. Any loosely woven, non-elastic fabric will stretch more or less on the diagonal of the lines of the weave. This property was utilized by cementing fabric so stretched to a sheet of rubber. This was the basis of the Tyer patents. Another plan was to combine a soft, woven cloth with a stretched sheet of rubber by cementing the two together. Sometimes the rubber was placed between two such non-elastic fabrics. When allowed to contract, the rubber would pucker the cloth, or "shir" it, thus giving the compound material the name of "shirred" goods. But it was with the production of vulcanized rubber thread, and the adaptation of various looms to weaving into fabrics that the best product was evolved.

The materials entering into the manufacture of elastic fabrics are cotton, wool and silk yarns or threads, and rubber thread. The products are suspenders, garter webs, arm bands, goring for elastic side shoes, fabrics for surgical bandages, corsets, ladies' belts, and a thousand other articles where combined elasticity and durability are required.

WEAVING NON-ELASTIC FABRICS.

In weaving ordinary non-elastic cloths, the yarn, after arrival at the factory in skeins, is first dyed the required color, and then wound on bobbins or spools, some to be used for the warp and some for the weft or filling. In making the warp the requisite number of spools of this yarn are placed in a creel, so arranged as to carry out any desired color scheme; the ends are run through a reed, and then wound together on a large bobbin called a warp beam. This warp is then taken to the loom, and for the simplest form of cloth is threaded, by alternate threads, on two harness frames. In operation of the loom, these two harness frames rise and fall alternately, creating what is called a "shed" or opening through the warp threads, for the passage of the shuttle, which flies backward or forward at every "pick" of the loom, carrying the weft through the opened-up warp at each passage.

When a fancy weave is desired, the number of harness frames is increased according to the complexity of the design, and the movements of the harness are governed accordingly, the harness is used in the pattern sometimes running as high as twenty-five. In more elaborate designs and effects the Jacquard machine is often employed, which, instead of operating groups or sections of threads by the use of harness frames, operates each individual thread independently. This is done by the use of cards having perforations to correspond with each thread in the warp, such perforations being cut according to design. These cards revolve round a cylinder, thus governing the movement of each thread as the shuttle travels back and forth across the shed. Complex as are such looms, the elastic, narrow fabric looms are more so, because, instead of weaving a single fabric, they weave simultaneously a number of fabrics, from 12 to 48, according to the width and character of the goods being made. Each of these webs is made by a perfect loom in itself, having its own set of warps, shuttle and harness, all contained in one loom frame. The machines may make one or more patterns at the same time, according to the scheme of harness draft, or patterns cut on the Jacquards employed.

THE ELASTIC WEB LOOM.

If to this complex mechanism are added two new elements, one may imagine the intricacy of the elastic web loom. One of these requisites is the introduction of the rubber thread warp, woven under a very high tension, bound or woven in between two distinct cloths, often of different colors and texture, in such a way as to hide the rubber threads completely. The other requisite is the complicated arrangement of the harness, so as to produce in the weaving two distinct cloths, an upper and a lower, so bound together as to weave the stretched out rubber thread between them, thus affording it protection against exposure, wear and tear.

The rubber threads are handled in the loom in the same way

as the yarns in the warps, but it is necessary that they be woven under tension, otherwise there would be no contraction of the fabric after it is woven, and therefore no elasticity. This matter of tension is important, and requires careful adjustment, according to the amount of elasticity desired. This is accomplished in a comparatively simple manner. The rubber threads are wound tightly upon a large spool or beam at the back of the loom, and from this they are run through reeds and harness. To retard this thread, so that it goes through the loom at a tension, various kinds of brakes are used, which automatically regulate the feed.

SUSPENDER LOOMS.

Perhaps the most complicated looms for these fabrics are those used for the manufacture of suspender webs. Such webs are made with various patterns in the weave, and in a variety of color designs for ornamental purposes. Most of the looms carry about 24 shuttles, and make simultaneously that number of webs, all of one pattern. Some looms have shuttles that move in a semi-circle, rather than a straight reciprocating motion, which saves much space, and allows about 36 shuttles to work in the same length of loom as 24 laterally moved shuttles. Again, there are some looms which have only three shuttles. Each of these schemes has its advantages. When a thread breaks the stopping of a loom for its repair may delay 24 or 36 shuttles, but only 3 in the smaller machine, although one operator can oversee more webs on the larger loom than on a multiple of the smaller. The webs are mostly made between 1⅛ and 2 inches wide, and contain from about 15 to 38 strands of different sized rubber. Some webs, called "truss webs," have an extra thickness of fabric on the back to protect the rubber strands from perspiration, for this emanation is especially destructive.

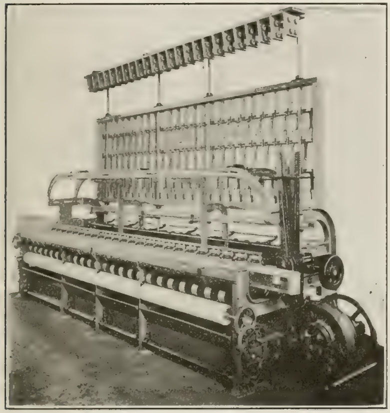


Fig. 2.—Schaum & Uhlinger Suspender Loom.

Some suspender webs have a surface design overshot with silk in various colors; and these necessitate in some cases the use of 15 or 18 harness frames, and the employment of special devices to regulate the warp threads as the shuttles carry the colored silks across. Every conceivable shade and color of yarns are employed, of sizes ranging all the way from 10/2 to 100/2.

WEAVING FANCY SUSPENDER WEB.

The loom shown in Fig. 1 is a popular type used for the manufacture of fancy suspender webs. It combines great capacity for elaboration of design with high speed of operation. This loom was introduced about 1875. Up to that time all fancy effects made in elastic webs were produced on Jacquard looms, which were necessarily slow running and complicated to operate, thus making the goods very expensive. The Jacquard machine has been largely superseded by the fancy head loom.

With the fancy head it is possible to operate as high as 25 harness, and the length of the design is governed by a chain of any length, so that a large scope of figures is obtainable. This does not in any way interfere with the speed and production of the loom. Another feature of this machine is the differential take-up gears which feed the web down through the press rolls as it is woven. This consists of a series of boxed-up gears, so arranged that by a simple movement the feed can be made either fast or slow, without the change of any gear, as is necessary with the ratchet take-up.

Another loom shown in Fig. 2 is a 24-piece, straight shuttle, end-cam suspender loom. Instead of the movements of the harness being controlled by cumbersome and almost inaccessable cams and their shaft running through the entire loom with its tangled mass of wires connected to the cam levers and the harness, there is a small set of end cams and cam jacks with wires running over pulleys set in the main arch of the loom frame, direct to the harness. These cams, which are seen on the right end of the machine, are easily accessible for adjustment and repair, and are very simple of operation. Great improvement has also been made in the press rolls, which are not only much more simple and compact than formerly, but where operation is controlled positively by ratchet take-up gears, fixed at the end of the loom, and which can be easily changed to accommodate to any desired feed. Perhaps the greatest change and improvement lies in the introduction of the warp levers, which automatically control the let-off of the cotton warp beams, doing away with the old-fashioned method of letting down the weighted pulley blocks. Such a loom is adapted for making all plain and twill goods, and can be run at a speed of about 160 picks per minute, producing about 2,000 yards per week.

When the webs are woven they are automatically wound upon rolls at the looms, from which they are removed in lengths of about 200 feet, the cuts generally being made at a place where a new lot of rubber or yarn has been started.

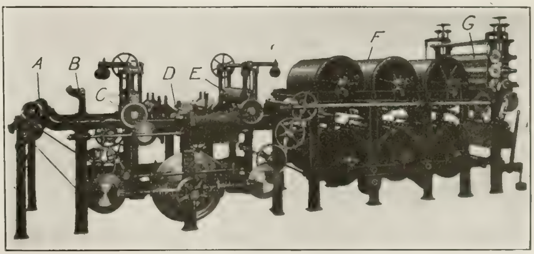


Fig. 3.—Machine for Finishing Elastic Webbing.

BURLING, SINGEING AND FINISHING.

As the web comes from the loom, there is more or less lint adhering to it. In some factories this is removed by passing the web through a burler. This machine is a combination of

brushes and a rapidly revolving knife, which delivers the goods smooth and clean.

A very complete machine for finishing elastic webbing is shown in Fig. 3. The webbing is run through the machine just as it comes from the loom. It first passes between a pair of brushes, *A*, which remove the lint and loose threads. From the brushes the webbing passes over tension bars *B*, having guide fingers for feeding the fabric between a pair of nip rollers, *C*, which hold it at a proper tension. The webbing then passes through a long box, *D*, for sizing or starching, the surplus sizing being squeezed out by a second pair of nip rollers, *E*. From this point the webbing passes over six steam-heated copper cylinders, *F*, and through delivery rollers, *G*, to the winding-up reels. The upper deck of cylinders, *F*, may be driven at the same speed or faster than the lower deck, so that the webbing is allowed to shrink as much as desired. The delivery rollers, *G*, may be driven at varying speeds for obtaining a slight polish on the webbing.

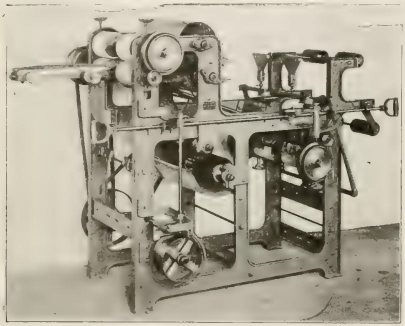


Fig. 4. Knapp Singeing Machine.

Some goods are subjected to a singeing process for the removal of lint. The machine shown in Fig. 4 is very generally used for singeing elastic webbing and shoe goring. The goods are singed on both sides at the same time, and are brushed both before and after singeing. The machine has an automatic device which removes the burners from contact with the goods when the mechanism stops, so that the fabric cannot be injured. Water rolls are employed as an additional precaution against injury.

The atmospheric condition has an influence on the rubber thread while weaving, and sometimes the fabric comes out in a more or less kinky condition. It therefore becomes necessary to finish it, which is done by first passing the webs through live steam, which has the effect of softening the outer cloth, and allowing the elastic more power to contract, thus increasing its elasticity. Then a size is applied, and the web run over heated drums, which dry the fabric and deliver it from the calender smooth and straight. It is then coiled in rolls as it leaves the machine, and if the web is then found to be long-sided or crooked, such rolls are steamed and placed on a heated plate until corrected. The webs are then inspected, measured and labeled, and stored in a dark, cool cellar until needed for the market.

A commercial report from Bucharest states that there is a great and urgent demand for rubber-soled sport shoes and general rubber goods in Rumania.

MEETINGS AND BANQUET OF MOTOR AND ACCESSORY MANUFACTURERS ASSOCIATION.

At the first meeting of the 1920 Board of Directors of the Motor and Accessory Manufacturers Association held January 8, officers were elected and committees appointed for the new year.

With one exception the 1919 officers were reelected. Thomas J. Wetzel, one of the retiring members of the board of directors, is succeeded as secretary and assistant treasurer of the association by G. Brewer Griffin, Westinghouse Electric & Manufacturing Co., New York City, a new addition to the board.

Considerable changes were made in the makeup of the various committees of the board of directors, but the chairman in each case remains the same. The names of the officers and directors follow:

OFFICERS FOR 1920.

C. E. Thompson, president, Steel Products Co., Cleveland, Ohio.

E. H. Broadwell, first vice-president, The Fisk Rubber Co., Chicopee Falls, Massachusetts.

Christian Girl, Standard Parts Co., Cleveland, Ohio.

W. O. Rutherford, The B. F. Goodrich Co., Akron, Ohio.

L. M. Wainwright, treasurer Diamond Chain & Mfg. Co., Indianapolis, Indiana.

G. Brewer Griffin, secretary and assistant treasurer, Westinghouse Electric & Manufacturing Co., New York City.

BOARD OF DIRECTORS.

C. E. Thompson, Steel Products Co., Cleveland, Ohio.

E. H. Broadwell, The Fisk Rubber Co., Chicopee Falls Massachusetts.

Christian Girl, Standard Parts Co., Cleveland, Ohio.

W. O. Rutherford, The B. F. Goodrich Co., Akron, Ohio.

L. M. Wainwright, Diamond Chain & Manufacturing Co., Indianapolis, Indiana.

G. Brewer Griffin, Westinghouse Electric & Manufacturing Co., New York City.

E. E. Allyne, Aluminum Manufacturers, Inc., Cleveland, Ohio.

E. W. Beach, Ferro Machine & Foundry Co., Cleveland, Ohio.

G. W. Yeoman, Continental Motors Corp., Detroit, Michigan.

E. P. Hammond, Gemmer Manufacturing Co., Detroit, Michigan.

J. M. McComb, Crucible Steel Co. of America, Pittsburgh, Pennsylvania.

A. W. Copland, Detroit Gear & Machine Co., Detroit, Michigan.

Following the annual meeting on January 7 the Association held its banquet in the Grand Ball Room of the Commodore Hotel. Approximately six hundred men were present. The entertainment program consisted of an all-star vaudeville bill, together with a number of other unusual features, including the first photoplay production of the association. It was a one-reel showing of "Our Own Topics of the Day," presented for the first time on any screen, and plotted, planned and produced for the entertainment of the Association.

The Philippine Islands as the source of America's future crude rubber supply is predicted by foresighted men of the rubber industry. In a recent statement, F. A. Seiberling, president of The Goodyear Tire & Rubber Co., declared that if importation of coolie labor was allowed in the Philippines, enough crude rubber would be produced to make America independent of relying on importations from other countries.

It was announced late last month that Harry S. Vorhis, of the Gutta Percha & Rubber Manufacturing Co., New York City, has been appointed general manager of the Mid-West Rubber Manufacturers' Association, and will take charge February 1.

What the Rubber Chemists Are Doing.

VARIABILITY IN PLANTATION RUBBER.[1]

At the Central Rubber Station a number of samples of the ordinary output of estates in the Netherland Indies are regularly tested. The review of this work by O. de Vries and W. Spoon is outlined in abstract as follows.

TENSILE STRENGTH.

The differences in tensile strength between smoked sheet and crêpe are inconsiderable. A real intrinsic difference in tensile strength between sheet and crêpe, tested in a strictly comparable manner, is hardly to be expected, as the difference in their preparation does not affect the tensile strength. Even the greater degrèe of milling in the preparation of crêpe in ordinary estate practice does not affect the tensile strength, the young rubber, still wet, regaining its strength completely, in contrast with excessive plasticising of older, dry rubber which often becomes heated in the process and loses tensile strength.

There is a marked difference in tensile strength in rubbers from different estates. As to the causes of the deficiency in this respect, our knowledge is still incomplete. The already known factors in preparation (excessive heat; tackiness, caused by copper salts; sunlight or lower organisms; growth of molds resulting in violet-colored spots in crêpe; use of some chemicals, as sulphuric acid or alum in coagulation) cannot give an explanation in such cases. Other known causes, such as latex from young trees, or excessive tapping of trees that will have to be thinned out, also do not always offer a sufficient explanation. It may be possible that soil, climate, or hereditary factors (strain of seed) play a rôle—factors which it would be very difficult to eliminate, so that a uniform high tensile strength for all estates cannot be reached at will.

SLOPE.

"Slope" is the stretch produced by a certain load at high elongations (determined after the method of Schidrowitz). A low figure for slope denotes a rubber with a great resistance to stretching at high elongations. The slope shows a relation to permanent set.[2] The average figures for slope of the samples tested in 1917 and 1918 are:

	1917.	1918.
Smoked sheet	37.2	36.5
Crêpe	35.9	35.5

Smoked sheet averages somewhat greater slope than crêpe. The variation in both grades is not large, nearly all samples falling between 34 and 39, while the ordinary figures for crêpe are 35-37 and for smoked sheet, 36-38. Whether this difference is of any practical importance in the comparison of first-grade samples will have to be investigated. The large deviations in slope are found in the lower grades, where the characteristic becomes typical.

RATE OF CURE.

The authors' "standard time of cure" in testing is the time necessary to bring the stress-strain curve to standard position (length 900 per cent at 1.30 kilograms load).

The rate of cure is the property that has drawn the greatest amount of attention from most investigators, and certainly there was reason for it. It should, however, be stated clearly that the quality of the product in the strict sense of the word is expressed by tensile strength and slope which represent intrinsic properties of the rubber, while rate of cure is a property of more or less accidental nature. Faults in this respect cause trouble to the manufacturers, but are not irreparable, while shortcomings in tensile strength (in the sense of maximum tensile strength as we determine it) or slope cannot be remedied.

For 1917 and 1918 the average figures and the normal values of smoked sheet and first-quality crêpe have remained practically the same. The time of cure for smoked sheet is nearly 20 minutes shorter than that for crêpe, while the variability is 1¼ to twice as great. The same difference in standard time of cure (20 minutes) was found for smoked sheet and crêpe prepared from one lot of bulked latex, while for unsmoked sheet the time of cure was 29 minutes shorter.

The factors causing variability of line are: (1) composition of latex; (2) chemicals added; (3) changes in the non-rubber constituents; (4) smoke constituents and decomposition products formed by heating. The adoption of standard methods of rubber production is most important. Bulking of the largest possible lots of latex is one of the first needs to obtain a uniform product.

VISCOSITY.

As our knowledge now stands, viscosity determination in general cannot be used to judge of the properties after vulcanization, but supplies very useful figures to give an indication as to the cause of deviations. A fairly uniform rate of cure may be accompanied by rather large oscillations in viscosity. The explanation is that the estate prepares smoked sheet after standard methods but uses a so-called Barker smoke-house in which temperature may vary considerably, causing deviations in viscosity. Uniformity in viscosity does not insure uniformity in rate of cure and tensile strength, owing to factors causing a greater rate of cure and higher viscosity by incipient maturation.

A change in viscosity that accompanies a deviation in rate of cure may indicate whether the cause is to be looked for in errors or irregularities in the preparation, or in changes in the latex (condition of the trees) and may give very useful indications for controlling the methods of preparation on the estates and the properties and uniformity of their output.

EFFECT OF SOAKING COAGULUM IN WATER.

Dr. O. De Vries has reported in the Communications of the Central Rubber Station[3] the results of his investigation of the effect produced on the properties of the rubber by soaking the rolled or unrolled coagulum in water.

(1.) The general effect of soaking the coagulum, rolled or unrolled, in water is, in the first place, to cause an extraction of serum substances, a loss in weight in the dry rubber, and a decrease of cure. When kept in water a longer time, maturation sets in, which causes a further loss in weight, while the rate of cure increases and the original retardation diminishes or changes into an acceleration. The accelerators form in spite of the fact that a considerable part of the serum substances has been first removed by the water.

2.) The loss in weight by soaking amounts to 0.2 to 0.4 per cent for crêpe; ½ to 3 per cent for sheet, and 0.2 to 2 per cent for unrolled coagulum, according to hardness of coagulum, duration and intensity of extracting, etc.

(3.) Crêpe rubber that has so abundantly been treated with water during rolling, shows practically no change when soaked in water for a few hours after rolling.

(4.) Soaking freshly rolled sheet rubber in water has a more marked effect, which is considerable when the sheets are kept in water from ½ to five hours. Extraction for ½-hour gave, on the average, an increase of 13.45 per cent in time of cure, while for one to five hours gave average figures from 17½ to 25 per cent. Keeping in water a night causes the rate

[1] O. de Vries and W. Spoon, "*Archief voor de Rubber Cultuur*," July, 1919, page 266.

[2] "Journal of the Society of Chemical Industry," volume 36, page 1258.

[3] "*Archief voor de Rubber Cultuur*," September, 1919, page 369.

of cure to increase again, the average decrease is only 16 per cent; keeping in water for 48 hours gives a still smaller decrease, on the average 11.7 per cent. The maturation gradually tends to equalize the effect of the extraction of serum substances, and freshly rolled sheet kept seven days under water shows a time of cure of 55 minutes, nearly that of matured rubber.

(5.) Soaking sheet rubber in water does not prevent rustiness.

(6.) Keeping the freshly rolled sheets in water for some time is of prime importance, not only to prevent the cases of greasiness (hydroscopic serum substances on the surface of the sheet), but to diminish the tendency to moldiness.

(7) Keeping the unrolled coagulum in water gives similar results, but the effect differs with the thickness and hardness of the coagulum.

The simplest way to prevent rustiness in actual estate practice is to take care that the surface of the sheet dries so rapidly that the micro-organisms, that grow only on the surface exposed to the air and need moist surroundings, have no time to develop.

CONCLUSION.

The defect called "rustiness" in sheet rubber is not caused by a film of serum-substances, notably proteins, dried on the surface of the sheet, but it is formed by decomposition of the serum-substances by an ærobic micro-organism.

THE CAUSE OF RUSTINESS IN SHEET RUBBER.

In the Communications of the Central Rubber Station,[1] H. J. Hellendoorn discusses the causes of rustiness in sheet rubber, summarizing his experiments as follows:

In experiments in the laboratory and on estates, rustiness was always produced at will by keeping the freshly rolled sheets for some time, 24 or 48 hours, in a moist atmosphere. The degree of moisture of the atmosphere in which the sheet hangs shortly after rolling, is of the greatest importance. Sheets taken immediately after rolling into a drying room of higher temperature (40 to 60 degrees C.) never show rustiness, while air drying at room temperature produces rustiness during periods of wet weather.

When coagulum is kept in the dishes some time after coagulation, as over night, the side of the sheet that corresponds to the upper part of the coagulum—the layer that was exposed to the air, shows rustiness to a larger extent than the lower parts of the coagulum. The explanation is that on the surface of the coagulum the infection, and perhaps a growth of the ærobic micro-organisms may start earlier.

Rustiness can be prevented by disinfecting the surface of the freshly rolled sheet by soaking it for some time in dilute solutions of formalin, chinosol, or bisulphite. The same disinfecting effect may be produced by keeping the freshly rolled sheet for some time in the vapors of boiling water, or by immersing the sheets in hot water (60 degrees C.) This is the well known method formerly used to prevent rustiness and surface oxidation by enzymes.

The micro-organisms causing rustiness are ærobic; that is, they need air for their growth and do not thrive where the air cannot penetrate. For instance, when a freshly rolled sheet is tightly rolled up and placed in a moist atmosphere, only the parts exposed to the air develop rustiness, while the parts of the surface that stick together, so that the air cannot penetrate, remain free of rustiness. Like all micro-organisms, those causing rustiness have an optimum temperature (about 40 degrees C.).

The thin layer of serum-substances that remains on the sheet after most of the serum has dripped off, or the by-substances absorbed by the rubber, form the sources of nourishment for the micro-organisms. Dilute serum seems to be preferred to the undilute. Soaking the sheets in water after rolling, so that a great part of the soluble serum-substances is removed, does not prevent rustiness. In fact, under favorable circumstances rustiness develops on such sheets to a much larger degree. It is well known to planters that when sheets are soaked in water and the dilute serum so formed is kept for some time, a jelly-like substance develops, as if some grease or fat had been extracted from the sheets. This jelly-like substance is probably closely related to the substance forming the film of rustiness.

The question is of some practical importance whether smoke forms a sufficient disinfectant to prevent the growth of the organisms causing rustiness. Wet sheets hung in a smoke house at a somewhat elevated temperature and without much ventilation would be under favorable conditions for the development of micro-organisms, unless the smoke acted as a preventive. It seems that smoke does hinder the formation of rustiness under such circumstances to some extent, but does not wholly prevent it; and especially in places where the smoke does not penetrate so easily, for instance, near the sticks, or in places where two sheets come very close together, rustiness may develop. If care is taken that the sheets air-dry rapidly, so that they are sufficiently dry when they are placed in the smoke house, the disinfection by smoke is of no further importance.

[1] *"Archief voor de Rubber Cultuur,"* October, 1919, page 431.

DETERMINATION OF IRON AND ALUMINUM.

By C. B. Clarke.

The following is a method for the quantitative determination of iron and aluminum in ignited mixtures containing much greater amounts of alumina than ferric oxide.

The finely divided oxides are intimately mixed with acid potassium fluoride in a platinum crucible. The mixture is fused over a small flame until, after a few minutes, it becomes solid. Dilute sulphuric acid is then added, and the greater part of the hydrofluoric acid expelled by heating for a short time. The sulphates are then dissolved in water in a platinum dish; the iron is reduced by sulphur dioxide, the excess of which is expelled by carbon dioxide, the liquid is then titrated with permanganate of potassium in a Jena glass beaker.

In one analysis by this method, in which 0.007-gram Fe_2O_3 was present in 0.094-gram of mixed oxides, 0.0065-gram Fe_2O_3 was found.

The presence of considerable quantities of potassium hydrogen fluoride does not interfere with the titration.

The advantages of this method over that of fusing with potassium bisulphate are that no platinum passes into solution, and that it is much quicker.

INFERIOR GRADES OF RUBBER.

Dr. A. J. Ulté[1] has investigated the inferior grades of rubber to determine whether, besides the differences in external appearances, the internal qualities of such kinds of rubber show any difference. For this purpose the viscosity and the percentage of ash were ascertained from samples of pale and dark scrap of the same estate. The dark scrap gave a lower viscosity figure (averaging 97 against 113 for pale scrap) and a higher ash per cent (averaging 0.68 against 0.51 for pale scrap).

MAXIMILIAN TOCH, OF TOCH BROTHERS, MAKERS OF CHEMICALS and technical paints, has been appointed Adjunct Professor of Applied Chemistry at Cooper Institute, New York City, where he will give a course on the chemistry of india rubber.

[1] Communications of the Besoeki Experimental Station, Rubbber Series No. 12, *"Archief voor de Rubber Cultuur,"* September, 1919.

CHEMICAL PATENTS.

THE UNITED STATES.

Producing Rubber Synthetically. The process of changing limonene into a rubber-like substance, which consists in bringing the limonene into contact with metallic sodium. (Louis Gottschalk, Rahway, New Jersey; Esther Gottschalk, administratrix of Louis Gottschalk, deceased. United States patent No. 1,323,589.)

Sealing Composition for Cans, consisting of crude rubber, benzol, beeswax, paraffine wax, a d talcum powder in proportions set forth. (Austin Gilbert and Charles E. Vander Hoof, assigners to the Fischer Can Co.—both of Hamilton, Ohio. United States patent No. 1,323,752.)

Vulcanization Process and Product. A product made by incorporating a product of hydrolytic decomposition of a proteid and heating the resultant mixture with a vulcanizing agent to effect vulcanization. (Clayton W. Bedford, assignor to The Goodyear Tire & Rubber Co.—both of Akron, Ohio. United States patent No. 1,323,951.)

Process of Reclaiming Rubber, comprising treating simultaneously the vulcanized material in proper condition and under heat and pressure with a devulcanizing agent comprising xylol and aniline in the presence of a substance capable of combining with or absorbing sulphur. (John Young, Akron, and Winthrop W. Benner, Cuyahoga Falls, Ohio, assignors to the Firestone Tire & Rubber Co., Akron, Ohio. United States patent No. 1,324,093.)

Coated Fabric, comprising a sheet of fabric having a base coating containing rubber and a surface coating containing nitrocellulose. (Clarence Weare Howlett, Kokomo, Indiana, assignor to E. I. du Pont de Nemours & Co., Wilmington, Delaware. United States patent No. 1,324,154.)

Leakproof Composition for Tires, a composition for filling the walls of tire tubes. A mixture of about 16 parts of mineral wool to one of a mixture of gelatine and soap in proportion of about two of gelatine to one of soap and two ounces of the mixture mixed with a quart of water. (Arthur W. Swanberg, Minneapolis, Minn., assignor to Waldo B. Berryman, Lima, Ohio, United States patent No. 1,326,007).

Rubber and Method of Obtaining It by incorporating therewith sulphur, titanic oxide, zinc oxide, a black carbon pigment, and an accelerator of vulcanization other than titanic oxide, and vulcanizing the mixture. (Louis E. Barton, Niagara Falls, New York, and Henry A. Gardner, Washington, D. C., assignors to The Titanium Alloy Manufacturing Co., New York City. United States patent No. 1,326,319.)

Vulcanized Leather Substitute. Formed of a composition of matter composed of an excess by weight of rubber, and an excess by bulk of cork particles in combination with a fibrous material, reclaimed rubber, sulphur and glue. (Justus W. Matthael, Ingram, assignor to Armstrong Cork Company, Pittsburgh—both in Pennsylvania. United States patent No. 1,326,681).

THE UNITED KINGDOM.

Regenerated Vulcanized Rubber is secured by first pulverizing the material, then heating it in a vacuum or in the presence of an inert gas with continuous agitation, such as carbon dioxide or nitrogen, the temperature being such that fusion of the mass does not occur, and then when the heated mass is sufficiently plastic, suddenly cooling it by spreading on a cold stone or by projecting it into cold water or into a solution of sodium carbonate, caustic soda lye, or other liquid. (B. J. F. Varenhorst, 25 Jacob Gillesstraat, Haag, Holland, British patent No. 133,369).

THE DOMINION OF CANADA.

Rubber Compound of improved toughness, consisting of mixing on heated rolls rubber, vulcanizing material, thin roughened flakes of tough, durable, flexible, resilient material (such as fish scales) and then vulcanizing the mixture. (Niels D. Nielsen, Elyria, Ohio. Canadian patent No. 194,716.)

Rubber Fabrics. A compound integral rubber fabric comprising a stratum of moldable elastic rubber and a stratum of highly fiberized moldable rubber compound vulcanized together. (Gutta Percha & Rubber, Limited, assignee of John McI. Ogilvie, Toronto, Ontario, Canada. Canadian patent No. 195,326.)

OTHER CHEMICAL PATENTS.

GERMANY.

PATENTS ISSUED, WITH DATES OF APPLICATION.

305,624 "K." (June 10, 1917.) Process for the formation of substances resembling hard rubber. Transferred by Dr. Fritz Steinitzer, Fürstenfeldbruck bei München, to the Bakelite Co., Berlin.

317,145. (November 13, 1918.) Process for producing a substitute for gutta percha which is not sensitive to alcohol. Fabrik Oskar Skaller, Berlin.

317,721. (August 27, 1915.) Process for forming plastic substances from casein. Deutsche Kunsthorn Geschellschaft m. b. H., Hamburg.

THE FRENCH REPUBLIC.

PATENTS ISSUED, WITH DATES OF APPLICATION.

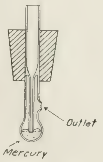
495,284. (January 30, 1919.) Process for accelerating the vulcanization of rubber. J. F. B. van Hasselt.

LABORATORY APPARATUS.

SAFETY VALVE FOR DISTILLING FLASK.

A very useful safety valve of interest to chemists is shown here as described by E. Rittenhouse in "The Journal of Industrial and Engineering Chemistry," August, 1918, page 633.

The valve is intended for use in a distilling flask when determining ammonia by absorption in standard acid solution. It will prevent the acid from going up into the flask by letting air in and breaking the vacuum. The valve is made entirely of glass, with a drop of mercury in the bulb. It is very effective, never sticking, always set. The principle, namely, the pressure due to a column of mercury, can be adapted to all low-pressure work, both above and below that of the atmosphere.

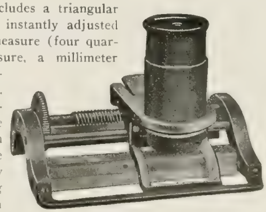


Safety Valve.

THREAD COUNTING MICROMETER.

In rubber works control laboratories handling textiles, the need has long been felt for a better instrument than the ordinary pocket linen counter in common use. This need has been well met by the Lowinson thread counting micrometer shown in the illustration.

The instrument includes a triangular scale, which can be instantly adjusted to provide an inch measure (four quarters), a linen measure, a millimeter measure, and the decimal parts of an inch. Being made of polished steel, each scale reflects the light upon the fabric beneath the lens. Greater stability is afforded by placing the knob, which, upon being moved by the finger, moves the index within, instead of outside, the frame of the instrument. By a disengaging device the index can now be quickly moved to any place on the scale. To facilitate the counting of even the finest fabrics a lens of unusually high power is provided. (Charles Lowinson, Inc., 366 Fifth avenue, New York.)


Thread Counter.

The Expansion of Rubber Compounds During Vulcanization.[1]

By C. W. Sanderson.

THE EXTENT to which rubber compounds will expand when subjected to the heat of vulcanization is of importance in the molding of rubber goods. As far as published results go, however, there are no available data on the value of the coefficient of expansion of rubbers of different compositions.

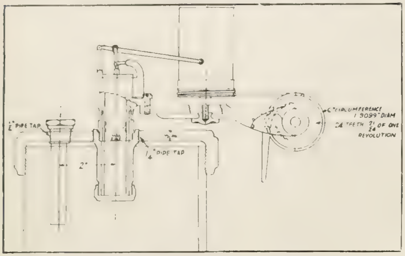


FIG. 1 RUBBER EXPANSION APPARATUS.

The work was undertaken by us primarily from a practical point of view, with the object of determining whether or not use could be made of an expansion test in distinguishing between stocks which move freely and mold well and those which do not mold well and are characterized as being "dead." Other possibilities suggested themselves and although the results are by no means complete or beyond question, they are set forth as we have found them.

APPARATUS.

A special apparatus was designed for the investigation (Fig. 1). It consists of a hollow steel cylinder which may be filled, with rubber and which is surrounded by a steam-jacket. The top surface of the rubber is the only surface free to move when the rubber is heated, and it acts against a piston and spring. The motion is transmitted through a magnifying lever to a recording pencil. The piston, spring and recording mechanism were taken from a Crosby steam indicator gage and made over to fit the apparatus. Above the piston is a place for a spring to keep pressure enough on the rubber so that it will not "blow." Ten, 50 and 100-pound springs were used. The ten-pound spring was hardly strong enough to prevent blowing. The use of the 50 and 100-pound springs will be mentioned later.

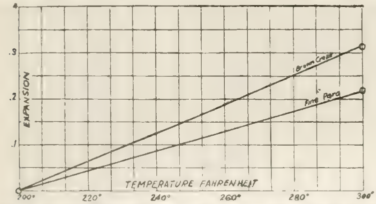


FIG. 2 CURVE SHOWING EFFECT OF RUBBER ON RATE OF EXPANSION 1698 FINE PARÁ *vs.* 1698 BROWN CRÊPE.

[1]Published by courtesy of the American Chemical Society. Paper read before the Rubber Division of the American Chemical Society, at Philadelphia, Pennsylvania, September 4, 1919.

In making the determinations of the expansion the rubber was heated at a constant rate, usually 20 degrees per five minutes. The recording cylinder was advanced at each interval and from the values on this graph smooth curves could be drawn.

The dimensions of the steel cylinder were: diameter, 0.7978-inch; height, 2 inches.

These dimensions were chosen so that at room temperature (80 degrees F.) the volume of the contained rubber was one cubic inch. The motion of the recording pencil was reduced to the motion of the piston by dividing by six.

The cubical coefficient of expansion, derived from the regular forms, may be expressed in simplified form if we neglect the expansion of the steel shell and approximate.

$$\text{Thus,} \quad a = \frac{x}{12t}$$

where $t =$ temperature change and $x =$ expansion recorded on the chart.

It was found that the differences in the results obtained with

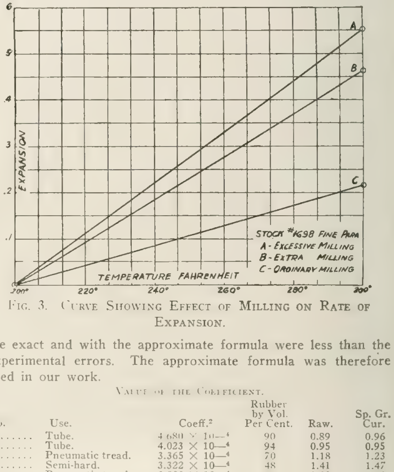


FIG. 3. CURVE SHOWING EFFECT OF MILLING ON RATE OF EXPANSION.

the exact and with the approximate formula were less than the experimental errors. The approximate formula was therefore used in our work.

VALUE OF THE COEFFICIENT.

No.	Use.	Coeff.[2]	Rubber by Vol. Per Cent.	Raw.	Sp. Gr. Cur.
1......	Tube.	4.680×10^{-4}	90	0.89	0.96
2......	Tube.	4.023×10^{-4}	94	0.95	0.95
3......	Pneumatic tread.	3.365×10^{-4}	70	1.18	1.23
4......	Semi-hard.	3.322×10^{-4}	48	1.41	1.47
5......	Pneumatic tread.	3.000×10^{-4}	66	1.39	1.40
6......	Sidewall.	2.807×10^{-4}	66	1.50	1.53
7......	Solid tire.	2.828×10^{-4}	71	1.83	1.87
8......	Pneumatic tread.	2.73×10^{-4}	59	1.44	1.53
9......	Hard rubber.	1.121×10^{-4}	58	1.31	1.33

Steel, 1.83 × 10 [illegible].
[2]Ebonite (Smithsonian table), 4.6 × 10 [illegible].

In general the results show that the higher the rubber content, the higher the coefficient of expansion. It is, however, difficult to show any definite relation because, as will be shown later, other factors enter in.

NATURE OF THE EXPANSION.

The graphs obtained showed that after the first fifteen minutes the expansion curve was practically a straight line. The beginning of its curve showed a lower scope because of the fact that the rubber was not thoroughly heated through or perhaps

had not been put in so as entirely to fill its cavity. Therefore, all measurements taken to determine the value of the coefficient were taken over the range of 100 degrees to 300 degrees. Some of the lower grade compounds, especially those with high sulphur contents, showed a lessening of the slope and even a falling off in the curve after 300 degrees had been reached.

INFLUENCE OF THE RUBBER.

Two samples were made up from the same formula, using in one fine hard Pará and in the other a soft grade of brown crêpe (Fig. 2). Each was subjected as nearly as possible to the same amount of milling. The Pará sample gave a coefficient of 2.337×10^{-4}, while the brown crêpe gave 4.49×10^{-4}.

INFLUENCE OF THE MILLING.

Other parts of the same batch with the Pará rubber were subjected to further milling and a sample gave a coefficient of 4.680×10^{-4}, while another sample which had been milled to excess on hot rolls gave a value of 4.786×10^{-4} (Fig. 3). Then it is seen that milling increases the expansion and brings the value of Pará up to that for the brown crêpe.

VOLUME CHANGE AT CONSTANT TEMPERATURE.

One of the first questions which arose in connection with the expansion of the rubber was whether or not there was a break in the curve or, in other words, a volume change at the point of vulcanization. We know that a physical change takes place and that the specific gravity increases and therefore it was only natural to look for a drop in the expansion. The curves obtained with a rising temperature failed to show any drop, so samples were tried using a constant temperature o., in other words, subjecting the sample to the same condition as an ordinary cure (Fig. 4). The graphs failed to show any drop with the exception of the cases already mentioned. Even in those cases

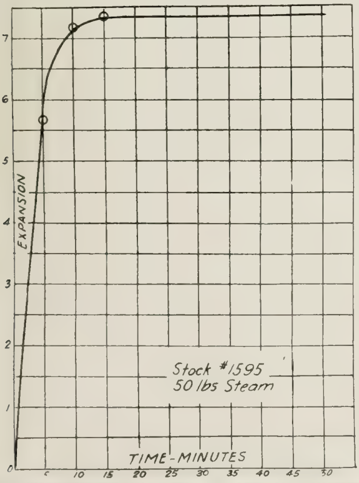


Fig 4. Curve Showing Expansion at Constant Temperature.

the drop was very gradual and did not start at the point of vulcanization. Therefore, the method could not be used as a method of regulating or determining the cure of a sample of rubber.

Since the curves failed to show any volume contraction during the heating process, the increase in specific gravity which always occurs must come as the result of the pressure and the subsequent contraction on cooling. Since rubber is nearly incompressible, the decrease must come as the result of the squeezing of air out of the raw rubber. If this be true, then a compound

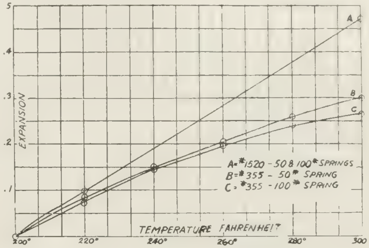


Fig 5. Curve Showing Effect of Different Pressures on Two Rubbers, One of Which Shows a Large and the Other a Small Difference Between Raw and Cured Specific Gravities.

showing a big difference between raw and cured specific gravity will expand more against a slight spring than against a strong one. This was tried out and found to be the case (Fig. 5).

	Expansion against Spring.	
Stock.	50-lb.	100-lb.
1520	3.81×10^{-4}	3.81×10^{-4}
355	2.17×10^{-4}	1.36×10^{-4}

Specific Gravities.

			Cured in Exp. Apparatus.	
Stock.	Raw.	Cured in Hydraulic Press.	50-lb. spring.	100-lb. spring.
1520	0.95	0.957	0.956	0.956
355	1.457	1.568	1.568	1.577

EXPANSION VS. CONTRACTION.

The increase in specific gravity shows that the contraction is greater than the expansion. Therefore the question arises whether or not the values obtained apply to the cured rubber. In order to determine this, measurements were made on samples cured in a disk mold.

Aluminum mold	1595 stock
Diameter of mold hot	$3^{31}/_{32}$ inches
Diameter of rubber cold	$3^{29}/_{32}$ inches

$$a = \frac{L_t - L_o}{L_o\, t} = \frac{0.0625}{39063\ (218)}$$

$$a = 0.00007339$$

$$a\ (\text{cubical}) = 2.20 \times 10^{-4}$$

This compares with 2.8×10^{-4} obtained the other way. This is a check considering the fact that the rubber was of a different sample and was from mill stock, while the expansiometer sample was from calendered stock. The conclusion may be drawn then that the coefficient determined between 200 degrees and 300 degrees be taken as sufficiently accurate for the coefficient for vulcanized rubber from the same sample.

CONCLUSION.

Although it is not yet possible from the results obtained with this apparatus to state definitely whether or not a stock will mold well in factory practice, it does give us a means of distinguishing between batches of the same stock which may have different properties, due either to rubber milling or other conditions.

The results may be summarized as follows:

I. The values of the coefficient of cubical expansion for different grades of rubber have been determined.

II. The higher the rubber content the greater the expansion.

III. The harder the crude rubber the less the expansion.

IV. The more the rubber is milled the greater the expansion.

V. There is no break in the expansion at the point of vulcanization.

VI. The increase in the specific gravity is caused by the pressure and not by physical change or internal contraction of volume.

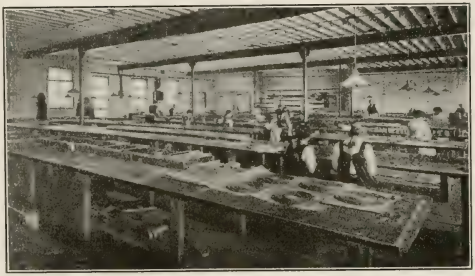
FOUNTAIN PEN INK SACKS.

The mechanical perfection of fountain pens has enhanced their utility and convenience to the extent that their acceptance as a writing instrument is well nigh universal. As a result their manufacture has become a highly specialized and important branch of the rubber industry. The hard parts of the appliance, except the gold point, are made of high-grade vulcanite capable of rapid and accurate machining. The production of these parts has been reduced to highly efficient machine shop practices, in which sixty or more distinct operations are involved.

The well-known self-filling feature of fountain pens depends on the use of a rubber collapsible bag filling the pen barrel and serving as a reservoir of ink. It is connected with the ink-feeding device and so arranged that the user may expel the air from the bag by collapsing it and, by thus causing a vacuum, draw in the ink supply.

These soft rubber ink sacks are hand-made, requiring some deftness in manipulation in their manufacture. Briefly, calendered sheets of Pará rubber compound of good quality are coated on ribbed holland cloths for the production of a ribbed effect on the rubber. This ribbing in the finished bag serves as a support to maintain the cylindrical form when the sack is only partly filled.

Although the corrugations on the sheet from which the sacks are made are usually produced as described above, there are other ways of doing it. For example, engraved rolls in connection with a calender are sometimes used, or impression plates of vulcanized rubber are substituted, the calendered sack sheet being placed upon the engraved plates and pressure applied until a definite ribbing is effected.



SEAMING AND TRIMMING SACKS.

From the calendered sheet, short length strips are cut crosswise of the ribbing. These are formed into tubing of the required size by hand-drawing through a die which unites the edges in a perfectly tight joint. Sections of this tubing are cut, slipped over suitable forms and, by means of sharp scissors, cut to fit the taper of the form at one end and the hemispherical end of the other, these cuts being formed into tight joints by the thumb-nails of the operator.

Instead of drawing the sheet through a die, the sack stock may be furnished in continuous lengths by being run through a tubing machine. There is another way: After the pieces have been died into blanks of the proper width, the edges are cemented and seamed by hand, the thumb-nails of the worker finishing the seam. In a third process a hammering machine strikes the two edges together, causing them to adhere firmly.

The sacks are then packed in pans of soapstone and vulcanized in open heat. In making these sacks in quantity, the metal "formers" over which they are made are assembled by the hundred on boards, each "former" standing on end in a little hole let into the board.

In removing the sack from the "formers" after vulcanization, they are turned inside out to get them off, which leaves the corrugated surface on the inside. They are turned back, cleaned for a short time in a tumbling barrel, counted by weight, and are then ready for shipment.

SELECTING SERVICE MANAGERS.

By Adrian B. French.

The duties of a service manager are of such a nature that he can almost be termed a "Trinity." He must be in a position to listen to the story that usually accompanies a claim for adjustment and handle the situation in such a manner as to produce a result fair to both his firm and the customer. It is not an easy matter to effect such a condition; types of persons differ in temperament and each one has to be handled differently; a constant psychological study is necessary to produce the best results. As long as rubber tires are manufactured, there will be adjustments to be made; tires may be adjudged perfect, after test, yet use is the final proof of the serviceability of the tire. It is almost a physical impossibility to produce a tire that will meet the demands of everybody, and hence arise conditions that are cause for adjustments. These conditions differ according to the nature of the service the tire is asked to perform, as do also the class and conditions of roads over which it has to travel. No manufacturing process can anticipate these things. The service man has to be on the jump all the time to get at real facts and has to be careful to keep the customer "coming." He must therefore be the first of the trinity—a diplomat.

Tires are manufactured according to the best methods and with the best material obtainable, and workmen are trained to turn out the best possible work. There is represented in every tire put on the market the best possible of all elements that enter into its makeup. In order to know when a tire is good, it is necessary to be familiar with its manufacture. This is not to be learned by tearing a tire to pieces to find out what is in it, but by knowing how it is put together from the start to the finish of its process of manufacture. With this knowledge, intelligent adjustment of tires is made possible in connection with detecting the presence of physical defects. The service man must therefore be in a position to size up a tire and discover these things. In this regard he must be the second of the trinity—a tire maker.

In dealing with adjustments service men are continually confronted with the situation of "the customer." It is to his interest to serve him conscientiously and fairly and at the same time protect his company. At times he may have to deal with a customer who "has a grouch on," due to tire troubles. The branch wants that customer's name to remain on its books as long as his business yields a profit. The salesman who secured his business at the start started with a perfectly good tire with which to demonstrate his product; the service man starts with a tire a customer is claiming to be defective; he therefore has two things to accomplish, satisfy his customer on a basis of adjustment and also sell him a new tire. There is consequently a responsibility resting with the service man, that of being the third feature of the trinity—a salesman. And

he has to be an accomplished salesman at times to hold a customer's business. As a rule, too little attention is given the Service Department by branch managers, and yet the Service Department can wreck a branch. It is as indispensable to the success of a branch as the product to be sold is. It is easy enough to sell a line of goods that as a general rule enjoys a good reputation; it is a different matter to deal with customers whose business in the Service Department is 100 per cent "condition to correct."

It is therefore indispensable that care be exercised in selecting the service man. He should be of good appearance, intelligent, quick to size up a situation, possess a knowledge of his product, be a diplomat and a salesman. He should be of the caliber that branch managers are made of.

A WORD OF CAUTION CONCERNING PNEUMATIC TRUCK TIRES.

By J. Newton Gunn.

THE PRESENT TENDENCY of tire manufacturers to recommend to truck operators promiscuous change-overs from solid to pneumatic truck tires leads me to offer a word of caution.

In my opinion the time has come when intelligent advice should be given to the truck owners of the country on this subject. There is reason to doubt whether truck owners in changing over indiscriminately from solids to pneumatics understand that such a change-over is not always satisfactory and may even be harmful to their trucks. The truth of the matter is that there are certain circumstances under which it is wise for a truck owner to use pneumatic tires and other conditions under which it is wise to continue to use solids.

The chief purpose in making this statement at this time is to prevent dissatisfaction to truck owners who, attracted by the success of the big pneumatics, may be contemplating discontinuing the use of solid tires and using pneumatic in their stead without inquiring into the suitability of the pneumatics for their trucks or their particular needs. It would be well for an owner to consult with a tire expert before making such a change.

A fact realized by few is that motor vehicles are built as a rule to meet the conditions imposed by the tires they are to carry. Most people regard tires as an accessory which have little influence on the structural design of the vehicle, but automotive engineers know that it is the tires which determine the general characteristics of the vehicle they are to carry. The development of the pneumatic tire was the chief factor in making possible the passenger car of to-day.

All except a few of the motor trucks in operation to-day were built from engine to rear axle along lines which would make them adaptable for use on solid tires. In designing these trucks, the sole object of the engineers was to secure the highest efficiency of operation possible under the limitations imposed by the natural characteristics of solid tires.

A small number of firms build trucks especially for pneumatics, but the number of makes of this sort is very limited. The number will undoubtedly grow rapidly, for the advantages of having a truck ride on air are so apparent that the demand for trucks designed for pneumatics cannot help but become great in the immediate future.

A truck designed for pneumatic differs radically from one built for solid tires. Truck and tire engineers are now working together to solve the problem of faster highway transportation and the solution is found in a truck specially designed to operate on pneumatic tires, having a chassis corresponding to that of a passenger car, an engine which will drive the vehicle at high speeds and still show the necessary economy in gasoline and oil, a rear axle and differential gears which will compensate for the larger outside diameter of the tires, and a braking system that is powerful enough to give the driver complete control of the heaviest truck under all conditions.

It is because most trucks are designed for operation on solids that truck users may find pneumatics unsuited to their requirements. If a truck designed for solids is changed over to pneumatic tires, the increased cost of this equipment can be most easily offset by increasing the radius of action; that is, increasing the speed. While the tires are designed for this, the engine, transmission, differential gears and brakes are not.

Another limiting factor that should be clearly borne in mind is that pneumatic truck tires have been satisfactorily perfected only in sizes up to 8 and 9 inches. Larger tires than this are still in the experimental stage.

There are some conditions under which it is wise to change over from solids to pneumatics, even though the truck construction contemplates the use of solids. There may be certain disadvantages as a consequence of the change, but these will be more than offset by certain advantages to be gained through use of the pneumatics. Because of the multiplicity of uses to which motor trucks are put, it is almost impossible to lay down any hard and fast general rule showing the conditions under which pneumatic tires should be used, or under which solid tires would be proper equipment.

Pneumatic tires have certain very definite advantages over solids. It is just as desirable to have all trucks operate on pneumatic tires as it is to have all passenger cars operate on pneumatic. The invention of the pneumatic tire was one of the greatest steps forward in the development of the passenger car, and the pneumatic tire for trucks is as great a step forward in the evolution of motor trucks. There is no doubt that ultimately pneumatics will be the standard equipment for practically all vehicles of this character.

TALC AND SOAPSTONE INDUSTRY.

America leads the world in the manufacture, use and production of talc and soapstone. According to the United States Geographical Survey the output sold in 1918 was 191,477 short tons, having an average value of $10.91 a ton. This was a decrease of 7,000 tons in quantity over 1917, but an increase of more than $200,000. Vermont produces the largest amount of talc, but New York's output, which comes second, is of greater value; California ranks third in quantity and in 1918 more than doubled the output of 1917. The United States produced about 58 per cent of the world's output in 1918 and imported, besides, 11 per cent of all the talc produced by the rest of the world. About 12,000 tons, 96 per cent of the importations, came from Canada and very little was exported. While there is plenty of low and middle-grade talc in the United States, the high-grade talc used for toilet powder, electric insulators and gas burners, comes from Italy, France, and India.

A new source of talc has been found recently in a dike of serpentine in Hartford County, Maryland. The California production is ground talc, found in Inyo and San Bernardino. There it is associated with limestone, and in part has a fibrous structure like that from the Gouverneur district of New York.

Virginia is the greatest producer of soapstone in the world; she shipped more than 15,000 tons in 1918. California also produces some soapstone.

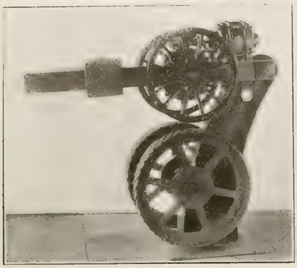
BUSINESS MEN OF MILWAUKEE, WISCONSIN, WHERE THE FOREIGN element is very much in evidence, have formed the American Constitutional League, with Frank R. Bacon, president of The Cutler-Hammer Manufacturing Co., as chairman. The League proposes to be non-sectarian and non-racial in membership and objects; it will devote itself to the work of Americanization in education and in publicity and to opposing all radical doctrines which threaten existing order.

BOLIVIA HAS IMPOSED AN EXPORT TAX OF FROM 2 TO 6 PER CENT on all rubber that leaves its territory.

New Machines and Appliances.

MOTOR DRIVEN TIRE TESTING MACHINE.

This motor-driven tire tester is of the latest design. It is arranged to drive the tires while running against rough surfaced wheels that are provided with cross strips to simulate the conditions encountered on the road. It is equipped with a speedometer giving the miles per hour and the distance traveled.



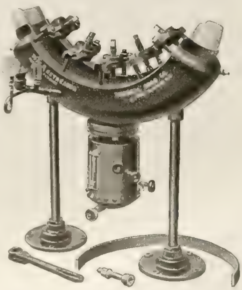
Thropp Tire Tester.

The wearing quality is figured out by means of two large weights that are moved all the way in on the bearing lever to give the same weight as on the front wheels of a normal size car, and all the way out, to give the same weight as on the rear wheels.

The bearings on the wheel shaft are roller bearing type, lubricated with compression grease cups. This machine is built to test 34 by 4-inch tires and is euipped with a $7\frac{1}{2}$ h. p. motor. (Wm. R. Thropp & Sons Co., East State street, Trenton, New Jersey.)

HIGH PRESSURE TIRE RETREADER.

This self-contained sectional tire vulcanizer is designed for effective duty and provided with a large factor of safety. The boiler shell is $\frac{1}{4}$-inch thick and the crown sheet is 5/16 thick and contains six 1-inch tubes. All boilers are tested to 220 pounds hydraulic pressure and given a thorough steam test before being shipped. Two types of burners are supplied, a gas burner or gasoline burner that generates in less than five minutes and will raise 50 pounds steam pressure in 35 minutes.



Type G Retreader.

The molds are all milled in a special machine built for that purpose and are very smooth in finish. The ribbed tread type of mold being the most popular. The highest grade of equipment is furnished with each mold, including a woven fabric bag, spring bar, socket and ratchet wrench.

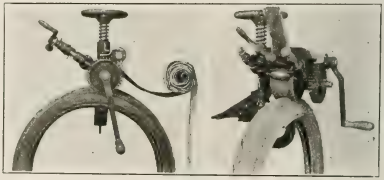
High-pressure retreaders are made in three sizes, type A-G curing $4\frac{1}{2}$ and 5-inch tires; B-G curing 4-inch tires; C-G curing 3 and $3\frac{1}{2}$-inch tires. (Zwebell Bros. Co., Milwaukee, Wisconsin.)

COMBINATION TREAD ROLLER, PEELER AND APPLIER.

This machine combines a tread roller that will not only apply and roll down the built-up tread or "camelback" in one operation but will also peel the old tread from the tire that is to be rebuilt.

It is substantially made, having a heavy frame post on which the head of the machine pivots and swings to one side while applying the tire. The head of the machine is then swung around in place, locked, and the pressure screws adjusted.

As a tread roller it will apply and roll down the raw stock at the same time, forcing all air away from in front and eliminating chances of trapping it, as the pressure is put on at the same time the tread comes in contact with the tire. As a tread peeler it will remove the old or worn tread from a tire in a short time.

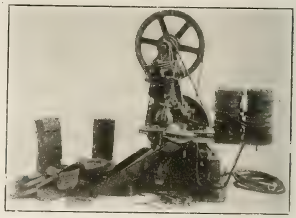


Tread Roller. Tread Peeler.

The driving power is back-geared "three to one" so that a sufficient pressure can be applied in rolling down the raw stock and power gained for peeling off the old tread. Both tread peeling and tread rolling attachments have regulating springs which automatically adjust the roller to the high and low places, keeping an even pressure on the tread regardless of how unevenly it may be worn or how rugged the non-skid design may be. (The Western Tire & Rubber Works, 321 North Crawford avenue, Chicago, Ill.)

WATER BOTTLE AND FOUNTAIN SYRINGE TRIMMING MACHINE.

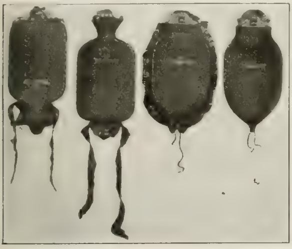
The accompanying illustrations show a water bottle and fountain syringe trimming machine and samples of its work. This machine does not operate automatically.



Water-Bottle and Fountain-Syringe Trimmer.

A table extending out from in front of machine, 14 by 16 inches, is held in position by two screws. The screw on the right-hand side fits into a slot in the frame which allows the table to be raised or lowered as if it were on a hinge. An upper and lower guard are provided which cover the cutting edges of the cutters and protects the bags. The two guards are adjustable. The space between them is for the overflow to enter.

In operating, the bag or bottle is laid on the table, and the table raised or lowered to bring the overflow line of the bag level with the point of contact of the cutters. The bags are then moved over the table similar to cloth passing through a sewing machine. The machine is practically fool proof and will remove 90 per cent of the overflow. Here may be seen the actual work performed on the machine. The method used in trimming the first bag shows the trimming was started at the lower corners (the upper corners shown in cut) on a straight line with the side and the overflow removed up to within a half inch of the neck. On the second bottle, the trimming was started about ¾-inch from the neck and the overflow removed up to within ½-inch of the hanger on each side.



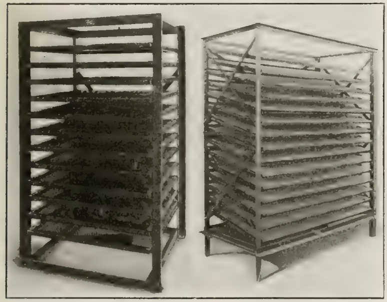
Methods of Trimming.

In the first method, with a little practice, from 12 to 15 bottles can be trimmed per minute. The second method takes a little more time, but removes more overflow. With more skill the result should be nearly the same. The third shows the syringe bag before being trimmed, and the fourth shows it after being trimmed. About 98 per cent of the overflow has been removed.—(T. W. Morris, 3304 Warren avenue, Chicago, Illinois.)

STANDARD COOLING AND DRYING RACKS.

The rubber stock cooling rack shown herewith is designed to save time, facilitate handling, economize floor space and increase production.

It has a cooling capacity of about 400 pounds of tire stock with each loading, or about 800 pounds per hour. The size is 30¾ by 30¾ by 62½ inches high, receiving 12 removable trays 30 by 30 inches. The trays are 16-gauge perforated steel with corner angles and 2 by 2 inch tray runs and 1 by 1 inch angle well reinforced.

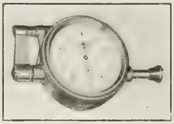


Cooling Racks. Drying Racks.

The drying rack is designed for drying jelutong and pontianak stock, etc., and is particularly adapted for use in drying rooms. Its capacity is about 600 pounds of stock when filled. Its size, 64 by 30 by inches by 7 feet 11 inches high. The corner angles are 2 by 2 inches, and the frames heavily reinforced to receive 15 trays 30 by 60 inches. Tray runs are pitched with the tray stops. The trays are 1 by 1 by ⅛-inch frame of heavy wire mesh, galvanized after weaving. (Chas. W. Carll's Sons, Trenton, N. J.)

RUBBER THICKNESS GAGE.

A most convenient and accurate dial pocket gage for use in measuring the thickness of calendered sheet rubber stock is that shown in the illustration. It is equipped with jaws which have large flat surfaces designed for gaging paper or rubber. It is graduated to read by 0.001 of an inch. The diameter of the dial is 1⅜ inches, and the spindle has a travel of 0.3-inch. (B. C. Ames Co., Waltham, Massachusetts.)



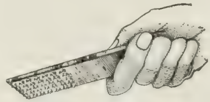
Pocket Rubber Gage.

INNER TUBE PATCH BUFFERS.

These devices are recommended for quickly and thoroughly removing chalk, bloom and grease from inner tubes preparatory to the application of rubber patches.

These buffers are made in two designs as shown in the illustrations, the Cordell is more effective but the Nugent occupies less space and therefore may be preferred. The principle is the same in both—small sharp-toothed projections that will clean the surface and not cut the tube deeply. (Cordell Manufacturing Co., 709 Pine St., St. Louis, Missouri.)

Cordell Buffer.

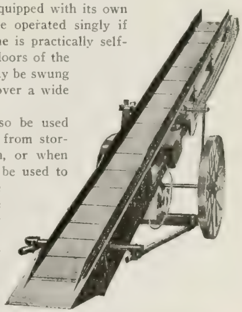


Nugent Buffer.

COAL HANDLING CONVEYORS.

The scoop conveyor shown in the illustration provides a convenient, efficient and flexible arrangement for handling coal or similar material. For example: five machines may be used to unload coal from hopper bottom cars direct to a storage pile. Each is equipped with its own electric motor and can be operated singly if desired. The first machine is practically self-feeding from the hopper doors of the car, and the other four may be swung around at any angle to cover a wide storage area.

These machines can also be used to convey the coal direct from storage pile into boiler room, or when desired, one machine can be used to load an electric storage battery truck to convey the coal directly into the boiler room.

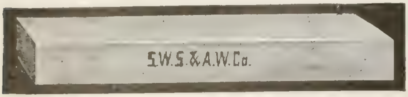


Portable Scoop Conveyor.

The advantage of using the scoop conveyor to unload hopper bottom cars is that no track hopper or pit is necessary, making it possible to unload cars at any point along the track. (Portable Machinery Co., Inc., Passaic, New Jersey.)

SANDSTONES FOR RUBBER WORKERS.

One of the best forms of whetstones for keeping in condition the hand knives used in ordinary rubber cutting is the old-fashioned sandstone which whets the steel without glazing as



Rubber Knife Sandstone.

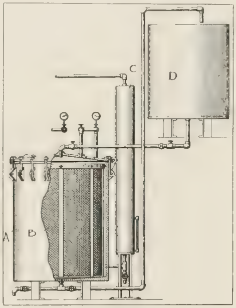
some of the harder sharpening stones do. It also has the merit of being inexpensive enough to permit of extensive factory distribution wherever cutting is done by hand. (Scranton Whetstone and Abrasive Wheel Co., Scranton, Pennsylvania.)

MACHINERY PATENTS.

APPARATUS FOR PRODUCING WATERPROOF FELT.

The object of this device is to produce waterproof fedt suitable for a substitute for leather in the manufacture of soles, suitcases, trunks and the like.

The container *A* is provided with a specially arranged screen *B*, between the convolutions of which the rectangular sheets of felt, one quarter of an inch thick, are placed. When a vacuum is created in the container by means of a pump connected to the vacuum tank *C*, the waterproofing material is admitted to the container from the tank *D*, and impregnates the felt. After a short period the waterproofing material is forced back into the solution tank, the impregnated felt sheets are removed from the container, pressed and submitted to a drying process. (Charles T. Dickey, Elizabeth, assignor to John J. Voorhees, Jersey City—both in New Jersey. United States patent No. 1,315,763.)



Felt Impregnator.

OTHER MACHINERY PATENTS.

THE UNITED STATES.

No. 1,323,573. Repair vulcanizer. P. P. Bongio and E. Stephenson, assignors to Two Cure Retread Mold Co.—all of Fort Worth, Tex.

1,323,606. Apparatus and process for impregnating and coating fabric. T. Midgley, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls—both in Mass.

1,324,016. Tire maker for tire-building machine. W. B. Harsel, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

1,324,170. Masticator. C. Pletscher and L. C. Reese, assignors to Werner & Pfleiderer Co.—all of Saginaw, Mich.

1,325,578. Bead-trimming machine. E. D. Putt, assignor to The Firestone Tire & Rubber Co.—both of Akron, O.

1,325,608. Last for rubber boots or shoes. H. W. Bastian, Summit County, assignor to The Firestone Tire & Rubber Co., Akron—both in Ohio.

1,325,670. Collapsible sectional tire core. F. H. Grove, E. M. McCurry, and G. R. Bilger, assignors to The Banner Machine Co.—all of Columbiana, O.

1,325,898. Mold for vulcanizing masks. M. A. Marquette, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls—both in Mass.

1,325,908. Trimming device. L. B. Pierson, assignor to The Fisk Rubber Co.—both of Chicopee Falls, Mass.

1,326,294. Apparatus for separating tires from cores. J. J. Shea, assignor to The Hartford Rubber Works Co.—both of Hartford, Conn.

1,326,357. Apparatus for coating tire rims. R. McClenathen, Cuyahoga Falls, and G. B. Heffelfinger, Akron—both in Ohio, assignors to Kelly-Springfield Tire Co., New York City.

1,326,375. Rubber-working machine. I. H. Spencer, West Hartford, assignor by mesne assignments to The Spencer Turbine Co., Hartford—both in Conn.

1,326,465. Automatic tire tube deflater. C. J. Powell, Romney, W. Va.

1,326,674. Tire core. E. Lookholter, Chicago, Ill.

1,326,675. Tire core. E. Lookholter, Chicago, Ill.

1,326,874. Apparatus for placing tires in molds. C. Macbeth and E. Sullivan, Birmingham, assignors to The Dunlop Rubber Co., Limited, Westminster, London—both in England.

THE DOMINION OF CANADA.

194,352. Apparatus for making pneumatic tire casings. J. L. G. Dykes, Chicago, Ill., U. S. A.

194,353. Tire vulcanizer. J. L. G. Dykes, Chicago, Ill., U. S. A.

194,462. Tongs for lifting tire cores. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of O. Grosvenor, New York City, U. S. A.

195,481. Manufacture of tire casings for pneumatic tires. E. Hopkinson, New York City, U. S. A.

194,653. Tire vulcanizer. W. B. Burke, Cleveland, O., U. S. A.

194,659. Tire abrader. F. N. Cordell, St. Louis, Mo., U. S. A.

194,758. Apparatus and method for making jar rings. The Anchor Cap & Closure Corp., assignee of H. E. Townsend—both of Brooklyn, N. Y., U. S. A.

194,931. Construction of pneumatic tire casings. W. L. Mitten, Davenport, Ia., U. S. A.

195,095. Apparatus for making tires. G. F. Knight and B. M. Frank, co-inventors, both of Canton, O., U. S. A.

195,131. Tire abrader. F. N. Cordell, St. Louis, Mo., U. S. A.

195,303. Apparatus for drying tire beads. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of G. McNeill, Detroit, Mich., U. S. A.

195,304. Rubber mixer. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of H. A. Welton and H. J. Hoyt, co-inventors, Detroit, Mich., U. S. A.

195,313. Apparatus for making tire casings. The Federal Rubber Co., Cudahy, assignee of A. A. Frank, Milwaukee—both in Wisconsin, U. S. A.

195,368. Tire gage. H. L. West, assignor of 1/3 to B. L. Cress—both of Red Cliff, Colo., U. S. A.

195,501. Apparatus for forming tires. J. T. Lister, Cleveland, O., U. S. A.

195,649. Guard for rolls of rubber mills, etc. L. Gaisman, assignor of ½ to S. Dreyfus—both of Manchester, Lancaster, England.

THE UNITED KINGDOM.

132,373. Tapping knife. S. Johno, 401 North Bridge Road, Singapore, S. S.

132,409. Outfit for inflating tires. W. T. Thorne, The Butts Garage, Worcester.

132,596. Air pump actuated by depression of tread of pneumatic tire passing over the ground. W. G. Cumming, 93 Lewes Road, Brighton, Sussex.

132,789. Mills for grinding rubber. Naamlooze Vennootschap Verschure en Co.'s Scheepwerf en Machinenfabriek, Amsterdam, Holland. (Not yet accepted.)

132,814. Apparatus for dipping rubber articles and drying them by heating mandrel from within. A. Boecler, 3 Fabriksgatan, Malmö, Sweden. (Not yet accepted.)

133,155. Apparatus for making solid rubber band tires. C. and A. E. Burnett, Sunnybank, Trowbridge, Wiltshire.

133,325. Apparatus for trimming tire fabric at inner edges of beads, etc. Firestone Tire & Rubber Co., assignee of E. D. Putt, 330 Russell avenue—both in Akron, O., U. S. A. (Not yet accepted.)

133,647. Loom for weaving pneumatic-tire casings, etc. E. Ingham, 302 Indiana avenue, Washington, D. C., U. S. A.

133,795. Apparatus for making rubber band tires of the type in which layers of ebonite are built up on a metal band, etc. St. Helens Cable & Rubber Co., Arpley, and B. Lee, Rose Cottage, Cow Lane, Sankey—both in Warrington, England.

133,808. Apparatus for recessing rubber. W. H. Phipps, 57 Wick Road, and W. T. Hooper, 71 Repton Road—both in Brislington, Bristol, England.

133,914. Wheel for severing or cutting vulcanite by grinding. Sterling Telephone & Electric Co., 210 Tottenham Court Road, and C. Harrison, 60 Rostella Road, Tooting—both in London.

134,584. Apparatus for shaping solid tires. C. and A. E. Burnett, Sunnybank, Trowbridge, Wiltshire.

THE FRENCH REPUBLIC.

493,604. Apparatus and process for reclaiming rubber. The Dunlop Rubber Co., Limited.

PROCESS PATENTS.

THE UNITED STATES.

No. 1,323,706. Manufacture of inner tubes. C. Macbeth, Birmingham, assignor to The Dunlop Rubber Co., Limited, Westminster, London—both in England.

1,323,976. Application of half-sole or repair tires. C. C. Gates, Denver, Colo.

1,324,178. Insertion of bristles in rubber pads. W. T. Sherman, Troy, assignor by mesne assignments to Henry L. Hughes Co., Inc., New York City—both in New York.

1,324,850. Manufacture of corrugated rubber articles. F. T. Roberts, assignor to The Paramount Rubber Co.—both of Cleveland, O.

1,325,465. Manufacture of reinforced pneumatic tires. C. T. Dickey, Elizabeth, asignor to J. J. Voorhees, Jr., Jersey City—both in New Jersey.

1,325,716. Manufacture of portions of a garter. R. Gorton, Brookline, Mass.

1,326,630. Waterproofing of garments, including seams and stitching. W. S. Barker, Cambridge, assignor to A. J. Tower Co., Boston—both in Mass.

Rates have been fixed by the United States Shipping Board for shipments of tires from Pacific ports to Hongkong, Shanghai, Kobe, Yokohama and Manila, effective December 15, 1919. Rubber tires, pneumatic or solid, in packages, will pay at ship's option 31¼ cents per cubic foot.

New Goods and Specialties.

CORD TIRE WITH NON-SKID TREAD.

One of the newer cord tires is illustrated herewith, having the appearance of strength and durability and being provided with an attractive non-skid tread. This tire is hand-built and carries with it a mileage guarantee of 10,000 miles, provided the purchaser has complied with the recommendations of the manufacturer with respect to style of rims used, amount of air pressure, weight of load, etc. (The Biltwell Tire & Rubber Co., Akron, Ohio.)

Biltwell Cord.

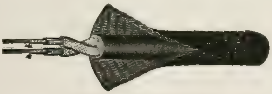
"HILO" FLEXIBLE VARNISH FOR RUBBERIZED FABRICS.

Automobile topping and similarly rubberized fabrics are expected to endure long and trying service under a wide range of climatic exposure from wet to dry and cold to hot, as well as sharp folding and mechanical abrasion. Such service conditions are particularly severe on the varnish surface coating which acts both as a lustrous finish and protector to the rubber composition and as water proofing.

A standard finish for this purpose is "Hilo" varnish which has found extended favor with makers of automobile topping because of its flexibility and resistance to cracking under service conditions. (Hilo Varnish Corp., Brooklyn, New York, and Chicago, Illinois.)

A COVERING FOR PORTABLE ELECTRIC CORD.

A new kind of covering for portable electric cord is woven like fire hose in thick, heavy strands, with each strand of the warp locked in place by the strands of the weft that run around the cord horizontally. After being woven, this heavy cord is impregnated with a high grade of rubber compound which insulates it far beyond the ordinary requirements and makes it adapted to the use of shipbuilders, miners, manufacturers, railroad men, etc. (Tubular Woven Fabric Co., Pawtucket, Rhode Island.)



"Duracord" Electric Cord.

A NEW BICYCLE TIRE.

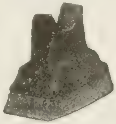
Simultaneously with the celebration of the silver anniversary of the pioneer manufacturer of bicycle tires, the same concern is putting on the market a new tire for the two-wheeled roadster which bids fair to come into its former popularity with both sexes.

This bicycle tire is all white and is expected to stand hard service, while its resiliency, it is claimed, will protect the rider and his wheel against hard road shocks. The tube is built around two plies of long-staple motorcycle fabric and is heavily frictioned with the white rubber. (Kokomo Rubber Co., Kokomo, Indiana.)

"Everlaster Twin Grip" Tire.

THE "SUCTION GRIP" LADDER FOOT.

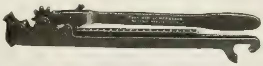
Among the various safety feet for ladders is one with suction grip for smooth floors. It is one of a set of different kinds of safety feet that this manufacturer has devised to adapt ladders to the different kinds of surfaces on which they are to be used. This particular foot has a rubber suction cup on the bottom which makes it grip the floor more firmly when increased weight pushes against it. It is attached by a bolt to the malleable iron holding frame on the ladder and is interchangeable with the others of the set which includes a steel point for rough wood floors, a point based on the abrasive principle for concrete floors, and the one shown in the illustration ready for attachment. (Chesebro, Whitman Co., Inc., First avenue, corner of 64th street, New York City.)



Ladder Grip.

A CONVENIENT TIRE TOOL

A self-adjustable tire tool that works with a rack and pinion movement is illustrated here. There is a reversible ratchet on the handle and a rear pawl which engages with the ratchet wheel when the front pawl is in neutral position. By working the handle back and forth until the rim is collapsed the desired distance, the tire will come off easily. The new tire is adjusted with equal ease. (The Trexler Co., 1418 Walnut street, Philadelphia, Pennsylvania.)



The "Trex" Tire Tool.

"VULCANIZE IT."

A patch material for repairing automobile, motorcycle, and bicycle inner tubes and casings; hot-water bottles; rubber boots, shoes, gloves, and coats; garden hose; and bath-room and hospital rubber goods of all kinds is called "Vulcanize It." It is self vulcanizing and is applied with a chemical compound which comes with it. (Allied Manufacturers Corp., 38 South Dearborn street, Chicago, Illinois.)

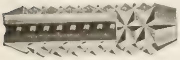
A BLACK AND GRAY CORD TIRE.

The cord tire with black tread and gray side-walls shown in the accompanying picture is one of the newer ones to appear on the market. It is made by the single-cure wrapped process by a secret method of construction that obviates the necessity of using air-bags, and each separate cord is first impregnated with high-grade rubber, then heavily coated with rubber, the first ply being also coated with a special rubber compound. (Bergougnan Rubber Corp., Trenton, New Jersey.)

Bergougnan Cord Tire.

REINFORCED PEDAL RUBBER.

A new rubber for application to motorcycle pedals has been patented by the inventor under date of October 28, 1919. It consists of a pedal cover of high-grade red or gray rubber, with knurled surface, reinforced by a coil of tempered steel wire running its length. The usual round hole is provided, but this pedal rubber can be had with a square hole if preferred. (Continental Rubber Works, Erie, Pennsylvania.)



"[illegible]" Pedal Rubber.

"KWIKFIX" RUBBER CEMENT.

The United States Patent Office has granted registration of the trade mark "Kwikfix" to designate a rubber compound used as cement. The application was Serial No. 117,016, noted in our issue of July 1, 1919, and the patent is No. 127,446, granted November 11, 1919. (Alick Merriman, 26 South street, Freehold, New Jersey.)

TWO MORE CORD TIRES.

Two new cord tires, one of which is a super-oversize, are pictured herewith. The Martin super-oversize tire, it is claimed, has unusual resistance to road shocks, bruises, overloading, etc.

Martin Super Cord.

The "Mono" cord tire is a pneumatic and is guaranteed free from imperfections in material and workmanship if used under reasonable conditions, with proper rims and pressure. (The Martin Tire Corp., 51st street and Sixth avenue, New York City.)

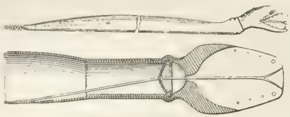
"Mono" Cord

STANWOOD HEEL PLATE.

In our issue of January 1, 1919, we described an accelerator foot-rest and in our issue of September 1, 1915, a step-plate, both produced by the same manufacturer. The step-plate now has a companion in a heel-plate intended for use back of the accelerator foot-rest. This heel-plate is smaller than the step plate, but, like that, comprises a perforated metal plate entirely covered with rubber and provided with a series of longitudinal ribs firmly molded to the metal plate. It is four inches wide and eleven and one-half inches long. This plate, which is intended to furnish a stable position for the heel when operating the pedal, may also be used as a toe and heel guard by setting it in a vertical position on the running-board shield. (Stanwood Equipment Co., 307 Plymouth Court, Chicago, Illinois.)

A RUBBER SNAKE.

Rubber is a favorite material for use in making objects to deceive the eye into believing them to be the real thing, and it is utilized in the manufacture of the figure toy shown here. The body is elongated and hollow, and the head has the mouth wide open. A flexible diaphragm operates the tongue, connected with a rubber band or light spring within the body. By squeezing the body air is forced against the diaphragm and the tongue projected, producing a very life-like representation of a snake. (John W. Clements, Dalton, Georgia.)



Rubber Toy Snake

A NEW CASING PATCH.

For the repair of cord or fabric ruptures a practical adhesive casing patch has been devised, consisting of four plies of high-grade inner-tube stock and one of rubberized stockinet. Between the third and fourth plies is set a piece of flexible wire mesh cut on the bias. The illustration shows the patch before it is molded and vulcanized, after which one side is coated with cement, protected by a gauze liner. The armored casing patch is stuck smoothly over the rupture so that both ends of it overlap the bead of the tire. It can be used as a blow-out patch. (Squires Tire & Rubber Co., Inc., Long Island City, New York.)

Cord Tire Patch.

"FIRO" SUPERHEAT PACKING.

A packing for which it is claimed that it will not burn or char in a joint or squeeze out when the bolts are drawn up is called "Firo." It is made of long, strong fibers of asbestos, with a suitable binder, and is formed into sheets under immense hydraulic pressure. It is supplied in sheets 1/32-inch, 1/16-inch, and 1/8-inch thick, weighing 3¼ pounds, 6½ pounds, and 13 pounds, respectively.

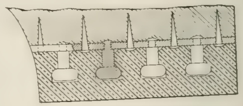
"TRIPLE DIAMOND" RUBBER BELTING.

A new kind of rubber belting is made of heavy, specially woven belt duck of considerable tensile strength. It has the plies united by rubber friction which the manufacturer claims will not separate in service. The surface is high-grade friction. This brand takes its name from the trade-mark, three overlapping diamonds, with lettering, stamped on the material.

Both the "Firo" superheat packing and the "Triple Diamond" rubber belting are made by the same concern. (New York Belting and Packing Co., 91 Chambers street, New York City.)

DETACHABLE HEEL.

A detachable and interchangeable rubber heel is shown in cross-section in the accompanying drawing. It is intended to enable a person to attach his own heels without the necessity for visiting a shoemaker whenever it is desired to substitute another heel for the one on the shoe. The lower section of the heel is of rubber, having molded sockets for the accommodation of metal studs which extend from the metal plate that attaches to the heel of the shoe. (George Schrade, 311 Stratford avenue, Bridgeport, Connecticut.)



Patented Removable Heel.

SURE FOOTING ON THE RUNNING BOARD.

A new style of safety step-plate is so planned that a red rubber insert can be made in the center, having the name of any popular make of car molded therein. The ribs run out from the center like the sun's rays, and the mat provides a sure footing on the running board of the car, in addition to keeping clean the inside. (Tyler Manufacturing Co., 64 Pearl street, Boston, Mass.)

Type D "Tymco" Step Plate.

INTERESTING LETTERS FROM OUR READERS.

To the Editor:

DEAR SIR:—I was painfully surprised to read your answer to Mr. McCormick's query on page 148 of the December issue of "The India Rubber World." Whatever his motive may have been in writing you, it betrays a low grade of editorial intellect for you to lose your temper as you did. And your slur on the Chinese is particularly stupid. China is a great nation with unlimited commercial possibilities for Americans. Obviously we have nothing to gain by antagonizing the Chinese, but ought to do all we can to make our relations with them even more friendly than they have been.

Paul H. Schmidt.

Milwaukee, Wisconsin, January 3, 1920.

ACCELERATOR INFORMATION.

To the Editor:

DEAR SIR:—If in keeping with your policy, I am wondering if you will be kind enough to let me have an expression from you on the relative strength of the following organic accelerators as applied to the same compound, the known factors being the compound and the cure:

(1) Aniline oil
(2) Thiocarbanilide
(3) Hexamethylene-tetramine.
(4) Paraphenylene-diamine.

As a concrete example, if the following formula were used taking hexamethylene-tetramine as a standard, using say one pound, what amounts of the other accelerators above mentioned, each in turn, would be required to replace the "Hexa" for the same cure:

Sulphur	2 pounds	8 ounces
Hexa	1 pound	0 ounces
Zinc oxide	5 pounds	0 ounces
Smoked sheets	91 pounds	8 ounces
	100 pounds	0 ounces

Cure: Say, 1 hour and 45 minutes at 45 pounds.. If this formula and cure will not suffice, then any one which you might be willing to suggest will be greatly appreciated.

What method would you recommend as being the most satisfactory for treating crude rubber (smoked sheets) with paraphenylene-diamine?

If a solution of paraphenylene-diamine is used:—

(a) What strength is generally required?
(b) What length of time would be required to treat the rubber?
(c) What temperature would you recommend to keep the solution while treating rubber?
(d) About what percentage of para-phenylene-diamine would the rubber contain after treating and being air-dried?

X.

A friendly rubber chemist comments upon the foregoing as follows:

A categorical answer to the first question is exceedingly difficult, for the reason that it presupposes a method of determining equal conditions of cure. In other words, it involves a definition of the so-called "optimum" cure, about which so much has been written and so little agreed upon. I presume that your correspondent would regard similar conditions of tensile strength and stretch as being indicative of the same cure, as they doubtless are from the standpoint of the practical rubber worker.

With this definition of cure then, the answer to your correspondent's question is, "It can't be done." I don't think the addition of any amount of aniline oil to the formula stated will bring about a tensile strength equal to that obtainable by means of the 1 per cent hexa. I also believe that it would be difficult to duplicate with hexa the physical tests obtained with paraphenylene-diamine. In other words, no quantitative equivalent relationship exists for the four accelerators in question.

The situation is precisely similar in the case of the inorganic accelerators. Supposing one were asked to state the numerical relationship between white lead, litharge, lime and magnesia. It can't be done.

In the case of the organic accelerators, it can, however, be stated with accuracy, that their order of potency is in accordance with the order in which they are stated in letter, aniline oil being the least powerful and paraphenylene-diamine being the most so.

Regarding the second series of questions as to the conditions of treating crude rubber with paraphenylene-diamine, I cannot be of much assistance, for the reason, very frankly, that I do not know the answer to them. I have had very little experience with paraphenylene-diamine because I feel that owing to its frightfully poisonous nature, it has no place in the rubber factory. Whenever I am asked regarding the advisability of using this accelerator, I am always tempted to quote Punch's advice to those about to get married: "Don't."

Chemist.

FROM A WELL-KNOWN RUBBER EXPERT.

I have for some time been trying to learn the use of paraphenylene-diamine, which is handled successfully by only a few. So far I am not sufficiently informed to give information worth while.

Regarding aniline oil, this material is fast being replaced by other materials because of its bad effect upon the people who handle it. It produces inefficiency from the office to the stable. Under the same conditions these accelerators I think would be used in about the same quantity except the fourth or last mentioned.

Hexamethylene-tetramine.—The results are very good, but it produces an itching that is unbearable.

Thiocarbanalide is also very good when clean, but much of it contains free nitro benzol, which, of course, is dangerous and should not be used. It is used in about the same quantity as the others, but is made safe by careful supervision and cleaned and kept clean throughout. Have had the best of success with it.

Some manufacturers use sulphuric acid in making a material they call by the name of thiocarbanalide. It has been proved to be detrimental in same instances by weakening the fabric, causing blow-outs.

HE ISN'T.

To the Editor:

DEAR SIR: The alleged confessions of a certain big gambler as chronicled in some of the daily papers describe the fleecing of a wealthy man entitled the "Rubber King." Who is he?

Boston, January 1, 1920. I. I. Reynolds.

(There are really scores of "rubber kings" in the preferred imaginations of dark-alley word-blacksmiths. Any man of wealth or prominence in the world is eligible. All that is necessary is a paper that will print and pay for the stuff—a few facts (or fancies), a so-called rubber king, unnamed of course, and much white paper is ruined.—The Editor.)

WITH REGARD TO SOLARIZATION.

To the Editor:

DEAR SIR:—A rubber man in the East sends me a compound for blue rubber that, as I understand it, is to be coated on cloth, then wrapped in muslin and vulcanized in the roll. He says, dry heat. Possibly he means that it should be hung or festooned in a hot-room. The compound calls for rubber, zinc oxide, ultramarine blue and sulphur. The amount of sulphur used is one ounce to the pound of rubber. Now, I can easily put the mixture in solution and spread it, but I am not sure that I wish to make a dry heater.

Out here we have moisture most of the time. I have been told that sunlight will cure surface goods. Is that so, and is the compound just the same as for the dry heat? How can I try this out?

John J. Adams

Pasadena, California.

(It is perfectly feasible to cure surface goods by exposure to sunlight. It is commonly called "solarizing." Use ½ ounce of sulphur instead of 1 ounce. Make the solution thin and run

several coats. A little experimenting will give you expertness in the sun cure.—The Editor.)

NEW TRADE PUBLICATIONS.

"Things That Interest Firestone Shareholders" is the title of a handsome 16-page brochure, bound in boards, which outlines the rubber situation and the tire demand in America and presents the outstanding features of the accomplishments, future plans, plant enlargements, and organization of the Firestone Tire & Rubber Co.

The Apsley Rubber Co. and the Middlesex Rubber Co., both of Hudson, Massachusetts, have issued their price lists of rubber boots and shoes for the season of 1920. These cover the well-known Apsley, Roch-Hill, Granger, Harvard, Deliverer, Hudson, Marlboro and Middlesex brands. As in the lists of other firms, prices average 15 to 20 per cent above those of last season, the advances being due chiefly to the higher costs of cotton textiles and labor.

The Beacon Tire Co., Inc., Beacon, New York, are issuing monthly a four-page trade folder, 9 by 12 inches, printed in red and black, entitled "The Beacon Light."

The Westinghouse Electric and Manufacturing Co. has issued an illustrated pamphlet, "Westinghouse Opportunities for Technical Graduates," which gives in detail the educational system devised by the company for training the graduates of technical schools in the various kinds of work it requires of them. It gives a list of 99 American and 14 foreign universities and technical schools which have contributed 5,000 graduates to its force.

The Gilbert & Barker Manufacturing Co., Springfield, Massachusetts, has issued a new and handsomely illustrated 28-page catalog of its oil storage systems, including tanks and measuring pumps. The outfits illustrated and described are in general use in factories, power plants and garages where lubricating oils and gasoline are handled.

"Ashland Chords" is the title of one of the latest house organs, "The Keynote of Ashland Tire and Rubber Company Harmony," as it is designated in the sub-title by its publisher, The Ashland Tire & Rubber Co., Ashland, Ohio. The first number, dated January, 1920, contains an account of the company's organization and progress in building, plans for selling and export, lists of officers and branch offices, the company's trade mark and a picture of the factory as it will look on completion.

HOLIDAY GREETINGS.

Once more has The India Rubber World received from the rubber and allied trades the cordial expressions of good will and appreciation, with kind wishes for the New Year. This publication takes this opportunity to return its thanks and to assure these friends that it heartily reciprocates their good wishes for progress and prosperity in this new year, which seems so full of promise for the rubber trade above all.

CALENDARS.

A beautiful and artistic water-color of a restful country scene adorns the calendar sent by Tyson Brothers, Inc., of Woodbridge, New Jersey, manufacturers of rubber substitutes and chemicals.

Another vivid war scene, "The flag that has never known defeat," representing boys in khaki going over the top, marks the calendar issued this year by Elmer E. Bast, Chicago, Illinois, manager of the Acme Belting Co., and of the United and Globe Rubber Co., Trenton, New Jersey.

Undoubtedly American is the strong face of Sachem Monatiquot on the handsome calendar of the Monatiquot Rubber Works Co., of South Braintree, Massachusetts, for which we are indebted to Merton A. Turner.

From Manchester in England and the Rubber Regenerating Company at Trafford Park comes a fine reproduction of Seymour Lucas's painting, "A Whip for Van Tramp," showing the seventeenth century improvements in naval architecture.

A restful view of woods and river in color, "The Land of Dreams," adorns the calendar of F. E. Woodward & Sons, Lachine, Province of Quebec.

The J. H. Stedman Company, scrap rubber, of South Braintree, Massachusetts, revives pleasant memories of New England by decorating its calendar with a fine photograph of the "Old Town Mill" at North Scituate.

A handsome photograph of some of their buildings illustrates the large, decorative calendar of the Pierce Co., East Rochester, New York.

Large and instructive photographs of the remarkable work turned out by the Wellman-Seaver-Morgan Co., Cleveland, Ohio, builders of rubber and other machinery, marks the clear and practical calendar it issues.

Lockwood, Greene & Co., Boston, Massachusetts, illustrated their 1920 calendar with views of many buildings and other concrete constructions erected by the engineering firm throughout the country.

Pictures of the many diversified products of the General Electric Co., Schenectady, New York, from an electrified railroad to a new lamp bulb, illustrate the large and useful calendar which the company issues.

The Armstrong Rubber Co., Garfield, New Jersey, takes its super-size tire as model for both the shape and size of its striking calendar.

An elegant, enamelled, metallic frame backed with enameloid gives the American Zinc, Lead & Smelting Co.'s AZO calendar the appearance of permanence. The unusually helpful calendar for 1920, fastened by an ingenious zinc screw arrangement, can come off and make room for 1921 when the time comes.

An attractive young person brightens the calendar of the L. J. Mutty Co., Boston, Massachusetts, manufacturer of automobile top fabrics.

From F. R. Henderson & Co., Inc., New York City, in paper of crude rubber, comes a handsome, leather-covered, adjustable desk calendar.

George Borgfeldt & Co., New York City, importers, send a calendar of celluloid with convenient scales.

The H. F. Taintor Manufacturing Co., New York City, dealer in whiting, sends a card calendar.

The New Jersey Rubber Co., Lambertville, New Jersey, manufacturers of reclaimed rubber, again send us their very convenient desk calendar.

A pretty girl at the wheel of a motor car attracts the eye to the calendar issued by the Katzenbach & Bullock Co., New York City, manufacturer of chemicals and colors.

SOUVENIRS.

The Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, through William H. Easton, sends a leatherbound, gilt-edged diary, containing useful tables and maps.

The Birmingham Iron Foundry, Derby, Connecticut, issues a leather-bound pocket memorandum book, provided with helpful tables.

The Morse Chain Company, Ithaca, New York, sends a leather-bound pocket diary with interesting information regarding its products.

John Royle & Sons, Paterson, New Jersey, makers of rubber and other machinery, send again their little leather-bound diary, with its many helpful tables and unusually convenient little maps.

From the Xylos Rubber Co., Limited, reclaimers of rubber, Trafford Park, Manchester, England, comes a handsome leather pocketbook, which holds also a booklet with detachable leaves for memoranda.

H. Muehlstein & Co., New York City, dealers in scrap rubber, provide again this year a handsome Russia leather satin-lined pocketbook for bank notes.

THE OBITUARY RECORD.

PRESIDENT OF THE GOODYEAR RUBBER INSULATING CO.

Theodore Whitney Blake, president of the Goodyear Rubber Insulating Co., New York City, and also of the Whitney Blake Co., New Haven, Connecticut, died suddenly at his winter residence, 1067 Fifth avenue, New York City, on November 27, 1919, aged 54 years.

Born in Oakland, California, May 3, 1866, the son of Professor William Phipps Blake, mining engineer and state geologist, he came of an illustrious ancestry. His great-great-uncle was Eli Whitney, inventor of the cotton gin. His great-uncle, Eli Whitney Blake, invented the Blake stone crusher used all over the world today. His great-grandfather, Jonathan Mix, invented the elliptical spring for carriages and wagons. These are but a few of the inventions this gifted family gave to the world.

As a boy, Mr. Blake was educated at the Hopkins Grammar School, New Haven, Connecticut, his home being in that city. He graduated from the Sheffield Scientific School, Yale University, Class of 88, as one of the "Honored Ten," because he had performed some splendid original experiments in chemistry.

Beginning work with the American Bell Telephone Co. in New York City, he rose rapidly from one position to another, then went to Stone & Webster's in Boston, Massachusetts. From there he went to The National India Rubber Co., Bristol, Rhode Island. Then he started the Goodyear Rubber Insulating Co., in New York City, he and F. S. Minott becoming partners. By his own energy and ingenuity he built this up from a small concern into the business it is to-day, and in 1912 he founded The Whitney Blake Co., at New Haven, Connecticut.

In 1900 he married Lillian Kaisley, daughter of Major Kaisley, U. S. A., and is survived by her, a daughter, Charlotte Hayes Blake, and a son, Kaisley Blake.

A man of remarkable energy and enthusiasm, broad vision and high ideals, clear judgment and unfailing optimism, ingenious with machinery and resourceful in its practical application, he was of the highest type of American business man. In New Haven, where most of his home life was spent, he was public spirited and associated with all that stood for real progress. Greatly did he love humanity, and deeply was he loved in return.

A CHICAGO TIRE DEALER.

Frank A. Williams, president of the Carlsten-Williams Co., Chicago, Illinois, well-known dealers in tires, died of pneumonia on December 18, 1919. He was born in Chicago in 1883 and had a public school education. At thirteen he entered the service of the Hartford Rubber Works as an errand boy and worked his way up until the company was absorbed by the United States Tire Co., in 1911. He then helped to organize the Carlsten-Williams Co., of which he was president from the beginning.

SPECIALIST IN INDUSTRIAL RELATIONS.

George Weston, a brother of Joseph C. Weston, vice-president of the Ajax Rubber Co., Inc., New York City, died in Philadelphia, January 7, 1920, after a brief illness. Mr. Weston was a well-known engineer, and a specialist in railway valuation and industrial relations. His recent paper on "The Adjustment of Industrial Relations," which appeared in the technical and lay press, earned for him well-merited recognition.

KNOWN TO MANY RUBBER MANUFACTURERS.

Word comes from Germany of the death in 1917 of Professor George S. Atwood, for a long time secretary of the American Association of Commerce and Trade in Berlin. Professor Atwood was an American of New England, and at one time one of the faculty of Bowdoin College, Maine.

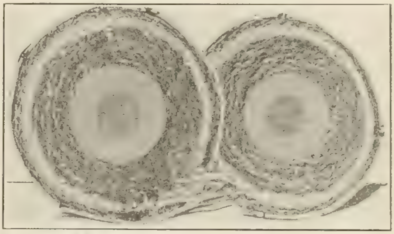
In 1906 he went to Germany as a teacher of English. He married and settled in Berlin, later being instrumental in founding the very excellent association of which he was secretary.

RUBBER IN BASE BALLS.

The actual manufacture of a ball begins with the formation of a piece of cork into a piece about the size of, and resembling, a marble. These pieces are previously examined and weighed and those not up to the required specifications are discarded. In the meantime, in another part of the factory, rubber is being molded into hemispheres that enclose the cork center, and are vulcanized.

The center is now ready for winding with wool yarn, the wool having been imported from Austrialia in the raw state in bales and put through the various operations of yarn making. The gage of the yarn and the tension under which it is wound must be exact, otherwise the ball will exceed the proper size.

When the wool yarn has been wound to almost the regulation size of the ball it is finished off with a winding of strong cotton thread, and an application of rubber cement given. The ball is



(A. G. Spalding & Bros.)

Baseball with Cork and Rubber Center.

now ready for its cover, which is sewn on by hand. The sewers, who work with awl and the strongest cotton thread, stretch on the two pieces of horsehide, the latter having been in preparation for at least sixteen weeks, and it is then given a final inspection before the box is sealed.

Some of the details that enter into the making of a baseball will be of interest, for instance: the cover measures approximately 25 square inches and is cut with special dies, only the best part of the horsehide being used. The length of the blue and white wool yarn windings, if stretched out in a single string, would measure over 400 yards, nearly a quarter of a mile.

Although the ball in a general way has followed the same specifications for many years, it was not until 1910 that the cork center was introduced which has since justified all the claims made for it.

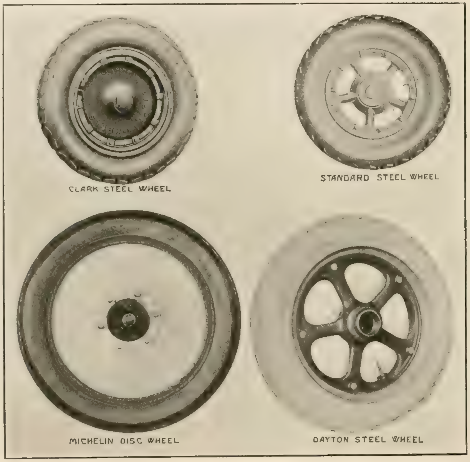
To assert that too much rubber in a ball would tend to make it dead seems ridiculous, but such was the case, and the remedy was discovered in the introduction of a small pieec of cork the center of what heretofore had been a solid piece of rubber. ("Spalding's Journal of American Sports.")

Penang, during the eleven months ended November 30, 1919, exported to Great Britain 208,115 pounds of crude rubber and to the United States, 121,734 pounds.

The National Automobile Shows.

The twentieth annual national automobile show, under the auspices of the National Automobile Chamber of Commerce, was held in New York City, January 3 to 10. Passenger cars were exhibited at the Grand Central Palace and trucks at the New York 8th Coast Artillery Armory. At this year's show there were listed in the catalog 84 makers of passenger cars, 74 of trucks, and 284 manufacturers of accessories. Unquestionably the exhibition was the largest and most successful so far held.

A notable feature of the show was the increased use over last year of disk and steel wheels on both passenger cars and trucks. The superiority of such wheels over those built of wood has been fully demonstrated by transport experience during the war and apparently will be more widely adopted each year, especially for the heavier cars and trucks, as is said to be the general rule on cars of European manufacture.



Metal Wheel Equipment for Solid and Pneumatic Tires Was the Feature of the Show.

ACCESSORIES AT THE PASSENGER CAR SHOW.

Of special interest among the accessory exhibits the following may be mentioned:

Auto Pedal Pad Co. Molded rubber foot pads for pedal operation.

Automatic Safety Tire Valve Corp. The Lox-on air chuck, a device for use in making a secure air connection with the valve for inflation of the tire.

Breeze Manufacturing Co. Flexible metallic tubing.

L. C. Chase & Co. Automobile topping, robes, mohair velvets, etc.

Coffield Tire Protector Co. A crescent-shaped endless pure gum protector to be placed between the tube and the tire tread. The effect is to deflect nails from penetrating the tube by means of a yielding thick mass of well-cured rubber.

Compression Tube & Tire Corp. A specially molded high-grade inner tube so shaped as to hold air after puncture by reason of the compressive strain exerted on the tread and side wall portions of the tube by the inflation pressure.

Eastern Rubber Co. Magic Mend, a self-curing plastic rubber composition adapted to close permanently small punctures in inner tubes, water bottles or similar soft rubber articles.

Essenkay Products Co. Tire-filling solid composition as a substitute for air-inflated inner tubes.

Essex Rubber Co. High quality red inner tubes and molded accessories.

General Electric Co. Fabroil gears. These consist of a cotton filler compressed under hydraulic pressure of several tons per square inch of side surface and held in compression by steel shrouds or side plates and threaded studs passing entirely through. Mazda lamps, and the Tungar apparatus for recharging batteries.

Keystone Rubber Mfg. Co. Tire accessories, cement, patches and inner tubes.

Morse Chain Co. Silent chain for transmitting power from gear to gear in front end drives in a variety of applications.

L. J. Mutty Co. Dridek automobile topping; single and double-texture rubber waterproofed cloths.

Geo. H. Reves Manufacturing Co.. Auto pedal pads.

A. Schrader's Son, Inc. Tire valves, pressure gages and special connections.

C. A. Shaler Co. Electrically operated apparatus for sectional repair vulcanizing.

Story Rubber Corp Bonner inner tubes, having one ply fabric on thickened rubber tread, the surface of which supports compression under pressure and prevents leaks.

Titeflex Metal Hose Corp. Flexible metal tubing without sliding joints for carbureter, exhaust, muffler and conduit connections.

Westinghouse Electric & Manufacturing Co. Rectigon battery chargers, Mazda lamps, air compressors and portable electric instruments.

ACCESSORIES AT THE TRUCK SHOW.

Jaxon Steel Products Co. A full floating wheel wherein the axle is carried by a disk supported on six pure rubber molded wheels which absorb the road shocks encountered by the surrounding steel rim solid tire.

Lambert Trublpruf Tire Co. A laminated solid tire built up with double plies of pictioned duck alternating with thick layers of rubber composition. The latter being pierced crosswise of the treadway by large holes in the two lower layers and staggered upper with lower, thus making a non-puncturable resilient whole.

Sewell Cushion Wheel Co. A composite wood and rubber wheel tired with an ordinary solid rubber tire. The construction includes a compressable bridge-like molded strip of resilient rubber held between the parts of a double felloc, faced each side by a molded ring of rubber held in place by bolted-on rings.

Wellman-Seaver-Morgan Co. Exhibited their tire-applying press, adapted for heavy hydraulic duty in mounting and demounting solid rubber tires.

News of the American Rubber Trade.

DIVIDENDS.

The Archer Cord Tire Sales Co., Louisville, Kentucky, has declared a six per cent cash dividend and a ten per cent stock dividend. Checks for the cash dividend, which is payable quarterly on stock of record December 20, 1919, were mailed January 15, 1920, and will be mailed at corresponding times hereafter. The stock dividend is payable to stock of record July 15.

The Brunswick-Balke-Collender Co., Chicago, Illinois, has declared the first quarterly dividend for 1920 on the common stock, at one and three-quarters per cent, payable February 15 on stock of record February 5, 1920.

The Electric Rubber Reclaiming Co., Barberton, Ohio, has declared and paid January 1, 1920, its regular quarterly dividend of one and three-quarters per cent on preferred stock.

The Hood Rubber Co., Watertown, Massachusetts, has declared its regular quarterly dividend of one and three quarters per cent, payable February 2 on preferred stock of record January 20, 1920.

The India Tire & Rubber Co., Mogadore, Ohio, has declared a stock dividend of forty per cent, payable January 2, 1920.

The Kelly-Springfield Tire Co., New York City, has declared the following dividends: regular quarterly, $1 per share, and stock dividends of three per cent on common stock, both payable February 2 on stock of record January 17; also quarterly dividend of $2 per share on eight per cent preferred stock, payable February 16 on stock of record February 2, 1920.

The Sterling Tire Corp., Rutherford, New Jersey, has declared the regular quarterly dividend at the rate of seven per cent per annum, for the three months ended Decembr 31, 1919, payable by check mailed January 15, 1920, to shareholders of record December 31, 1919.

The Portage Rubber Co., Barberton, Ohio, has declared a dividend of two per cent on its common stock.

The Rochester Tire and Rubber Co., Buffalo, New York, has declared the regular semi-annual dividend of seven per cent on outstanding preferred stock. This company has authorized a change in its name to "The Powertown Tire Corporation."

The Standard Underground Cable Co., Pittsburgh, Pennsylvania, has declared the following dividends: quarterly, three per cent; extra, three per cent; and special, three per cent; all payable January 10 on stock of record January 3, 1920.

The United States Rubber Co., New York City, has declared the following dividends: quarterly, two per cent, on common and preferred stock of record January 15, payable January 31; twelve and one-half per cent stock dividend, payable February 19 on common stock of record February 19, 1920.

FINANCIAL NOTES.

At the regular quarterly meeting of the directors of The B. F. Goodrich Co., held January 21, 1920, a dividend of 3½ per cent was declared on the preferred stock, 1¾ per cent payable Aprп 1, 1920, to the preferred stockholders of record at the close of business March 22, 1920, and 1¾ per cent payable July 1, 1920, to preferred stockholders of record at the close of business June 21, 1920. An additional dividend of ½ per cent was declared on the common stock, which, with the dividend of 1 per cent declared at the meeting of October 15, 1919, makes a total dividend of 1½ per cent payable on February 16, 1920, to the common stockholders of record at the close of business February 5, 1920. A dividend of 1½ per cent was also declared on the common stock, payable on May 15, 1920, to the common stockholders of record at the close of business May 5, 1920.

The directors voted, subject to the approval of the stockholders at their annual meeting March 10, 1920, to retire 11,880 shares of the preferred stock prior to July 1, 1920, in accordance with the requirements of the Charter.

THE FIRESTONE TIRE & RUBBER CO. STATEMENT.

The annual report of the Firestone Tire & Rubber Co. for the fiscal year ended October 31, 1919, shows consistent growth in volume of business and profits. The sales for the year were $91,078,513, against $75,801,506 for the preceding year, an increase of $15,277,006, or 20 per cent. The profits for the year, after allowances for depreciation and deducting bad accounts, were $9,306,978, of which $2,597,787 was paid as dividends, the balance being placed to surplus subject to income and profits tax accrued. It was announced at the annual meeting that an extra dividend of $2 per share would be paid to stockholders of record December 15, and that it was hoped to put each quarterly dividend on that basis.

During the year the capital stock of the company was increased from $15,000,000 to $75,000,000, divided into $10,000,000 of 6 per cent preferred stock, $40,000,000 of 7 per cent preferred stock and $25,000,000 of common stock. Of the increased capital thus authorized, $10,000,000 has been sold, approximately half of it to employes of the company. Firestone sales are now moving at the rate of $150,000,000 a year, and that is the goal set for the present year.

The balance sheet as of October 31, 1919, follows:

Assets.		
Lands, buildings, machinery and equipment		$18,820,214.82
Net sound book value.		
Investments in miscellaneous stocks and bonds		895,804.50
Current assets:		
Finished and in-process goods and materials and supplies	$24,159,519.58	
Cash	3,749,744.40	
United States Liberty Loan and Victory Bonds—market value	1,264,216.56	
Accounts and notes receivable	15,645,416.71	
Total current assets		44,818,897.25
House and lot accounts receivable and unsold real estate of the Coventry Land and Improvement Co.		3,812,409.77
Due from employes on account of purchase of common capital stock and sundry advances		5,004,811.38
Stock purchases are secured by deposit of stock as collateral.		
Expenditures applicable to future operations		401,460.83
Total		$73,753,598.55
Liabilities.		
Preferred, 6%, cumulative capital stock		$10,000,000.00
Authorized issue $10,000,000.		
Preferred, 7%, cumulative capital stock		10,000,000.00
Authorized issue $40,000,000.		
Common capital stock		3,500,000.00
Authorized issue $25,000,000.		
Current liabilities:		
Notes and acceptances payable	$5,812,691.06	
Accounts payable	3,336,517.81	
Accrued salaries, wages, taxes, etc.	1,639,869.56	
Subscription to United States Victory Bonds—unmatured installments	238,700.00	
Total current liabilities		11,027,778.43
Mortgages and notes payable of the Coventry Land and Improvement Co.		1,899,112.00
Reserves:		
For welfare work and pensions	$1,341,638.83	
For insurance losses	554,530.49	
Total reserves		1,896,169.32
Surplus		*35,430,538.80
Total		$73,753,598.55

*Subject to provision for corporation income and profits tax accrued for the year ended October 31, 1919.

Note.—The Firestone Tire & Rubber Co. has a contingent liability as endorser on $130,388.53 of notes and trade acceptances receivable, discounted.

The directorate elected by the stockholders is as follows: Harvey S. Firestone, A. C. Miller, L. E. Sisler, S. G. Carlshuff, J. C. Robertson, J. W. Thomas, Harvey S. Firestone, Jr., A. G. Partridge, C. A. Meyers and Thomas Clements. The officers reelected are Harvey S. Firestone, president; A. C. Miller, vice-president and general counsel; S. G. Carlshuff, secretary; J. G. Robertson, treasurer. Three new vice-presidencies were created, as follows: A. G. Partridge, vice-president, in charge of sales;

J. W. Thomas, vice-president, in charge of manufacturing; Thomas Clements, vice-president, in charge of offices and purchases.

ANNUAL BALANCE SHEET OF THE FISK RUBBER CO.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, has recently issued its annual balance sheet for the year ended September 30, 1919, which shows the following figures:

ASSETS.

Capital assets:		
At Chicopee Falls—		
Land	$197,473.63	
Buildings	3,694,739.50	
Mold equipment	868,571.69	
Machinery	2,714,145.51	
Plant equipment	2,403,054.19	
		$9,877,984.52
At branches—		
Land	$171,629.54	
Buildings	93,734.93	
*Leasehold	4,523.19	
Equipment for stores	688,310.01	
		958,197.67
Total replacement value		$10,836,182.19
Reserve for depreciation		1,721,624.88
Sound value of capital assets		$9,114,557.31
Good will		8,000,000.00
		$17,114,557.31
Investments:		
Miscellaneous, including Federal Rubber Co., 25,500 shares		$230,001.00
Current assets:		
Raw materials and supplies at cost or less		$3,968,056.16
Work in process at cost		728,123.45
Finished stock at cost		9,652,332.62
Accounts receivable, less reserve		9,316,650.40
Notes		71,458.72
Collateral notes—employes' subscriptions to capital stock		93,277.26
Cash		3,675,810.95
United States Liberty Bonds collateral to loan, per contra	$2,754,700.00	
Less officers' and employes' payments	210,153.50	
		2,544,546.50
		$30,050,256.04
Deferred charges:		
Prepaid rents, royalties, local taxes, interest and insurance		$84,246.78
Stationery and office supplies		38,026.24
Other prepaid expenses		143,887.20
		266,160.22
		$47,660,974.57

*Leasehold property is our Pittsburgh branch located on leased land, being charged off during the period of lease.

LIABILITIES.

Capital stock:		
7 Per cent cumulative first preferred—		
Authorized and issued: 150,000 shares, par $100	$15,000,000.00	
Less purchased for retirement, 5,000 shares, par $100	500,000.00	
		$14,500,000.00
7 Per cent cumulative second preferred convertibles—		
Authorized 70,000 shares, par $100	$7,000,000.00	
Less 20,955 shares, par $100, converted into common stock	2,095,500.00	
Outstanding 49,045 shares, par $100		4,904,500.00
Common:		
Authorized 800,000 shares, par $25	$20,000,000.00	
Unissued 480,000 shares, par $25	12,000,000.00	
Issued 320,000 shares, par $25	$8,000,000.00	
Issued 114,380 shares, par $25, for conversion of first preferred convertible and second preferred stocks	2,859,500.00	
Outstanding 434,380 shares, par $25		10,859,500.00
Total capital stock outstanding		$30,264,000.00
Current liabilities:		
Loans payable		$1,650,000.00
Accounts payable		2,830,601.74
Accrued taxes and wages		276,476.04
Loans payable, per contra—United States Liberty Bonds		2,149,500.00
		$6,906,577.78
Balance of 1918 Federal income and war taxes (due December 15, 1919.)		$356,547.15
Excess of appraisal value of capital assets over book value at March 31, 1919		$1,027,931.86
Reserves:		
Reserve for branch insurance liability assumed by company		$103,797.90
Reserve for mileage guarantee		100,416.58
Reserve for contingencies		52,679.75
Reserve for 1919 Federal income and war taxes		839,879.74
		$1,096,773.97
Surplus:		
Balance at December 31, 1918		$4,425,923.35
Surplus appropriated for retirement of old first preferred stocks restored to general surplus		1,938,542.19
Premium received on sale of 25,000 shares second preferred stocks		875,000.00
Miscellaneous income, including $191,000 resulting from conversion of first preferred convertible stock into common stock on basis 5 for		195,689.85
Profit January 1, 1919, to September 30, 1919, per schedule 7		4,199 399.06
		$11,634,554.45
Deduct:		
Dividends declared (first preferred stock—to August 1, 1919)		$492,796.58
Dividends declared (second preferred stock—to September 1, 1919)		215,774.00
Provision for Federal income and war taxes		1,012,641.70
Premium paid for retirement of old issue of first preferred stock and commissions paid underwriters of new first preferred and second preferred stocks		1,878,995.55
Miscellaneous expenses in connection with isssue and sale of new first preferred and second preferred stocks		25,202.81
		$3,625,410.64
Balance		$8,009,143.81
		$47,660,974.57

The Hood Rubber Co., Watertown, Massachusetts, has formed a new subsidiary company under the name of Hood Products Co., Inc., which will deal in all kinds of rubber and leather goods, has been incorporated under Massachusetts laws with an authorized capital of $1,500,000, consisting of 10,000 preferred and 5,000 common shares. The preferred dividends will be cumulative at 7 per cent.

Sales of the Mason Tire & Rubber Co. for its third fiscal year, ended October 31, 1919, amounted to $3,468,858.52, with a net profit of $223,705.52. This is an increase of about 50 per cent over the preceding year's totals. During the past few months the company has opened ten additional direct factory branches in the United States, making eighteen in operation. The goal is a $7,000,000 business during the present fiscal year.

DUNLOP AMERICA LIMITED TO BUILD TIRE PLANT AT BUFFALO.

Dunlop America Limited has been incorporated, and will acquire all the rights of the original American Dunlop Tire Co. About 150 acres of land at Buffalo, New York, have been purchased, upon which will be erected a tire plant of the most modern kind. Cord fabric, which will be exclusively used, will be spun, twisted and woven from the raw cotton in a specially designed fabric plant on the Buffalo site. The Dunlop company believes in specialization and, therefore, with the exception of the Dunlop golf ball, its production will be confined to high-grade pneumatic cord and solid truck tires.

Dunlop America Limited as an American company will be operated by an American staff. The board will include a strong American element, as well as some of the chief members of the board of the British company, and will have the benefit of a full interchange of patents and technical processes with the British and other Dunlop companies, as well as the services free of cost of an advisory committee constituted from the expert staff of the British organization. The names of the directors and executive officers of Dunlop America Limited will be announced later.

SAVOLD TIRE REORGANIZATION.

The Savold Tire Corporation, New York City, which was incorporated early in 1919, and whose stocks had such an erratic career on the New York curb market, has been thoroughly reorganized in order that full advantage might bè taken of existing possibilities. Those who formerly controlled its policies have stepped aside and a new personnel is now in charge.

THE PENNSYLVANIA RUBBER CO.

The Pennsylvania Rubber Co., which was incorporated in May, 1899, by Herbert Du Puy and others, began business in Erie, Pennsylvania, where it bought up the business of the Keystone Rubber Co. and the plant of the Erie Rubber Co., one of the pioneers in the trade, going back to the '80s. Three years later the plant was moved to Jeannette, Pennsylvania, on the Pennsylvania Railroad, twenty-six miles from Pittsburgh, where since 1902 it has gone on manufacturing belting, packing, hose, all kinds of rubber goods, particularly tennis balls and tires, at first for bicycles and carriages, then when the automobile came, for motor cars.

The business has expanded greatly in late years under the management of Seneca G. Lewis, so that four years ago the India Rubber World published a picture of the improvements in the plant. At the end of 1917 the capital of the company was increased to $6,000,000.

The illustration gives some idea of the remarkable expansion of the business of the company in the past few years by the comparison of the original factory with the present plant.

It also shows to some extent the buildings which the company is putting up to secure the welfare and comfort of its employes.

The company employed 460 hands in 1910, and turned out 120 motor tires a day and as many tubes. This year the number of employes is 2,849, the daily output of automobile tires is 3,000, and of bicycle tires 3,000 also, while 5,500 automobile tubes are turned out. The company manufactures, besides, a greater number of tennis balls than any other concern in America.

The new buildings now being constructed will treble the present production. The company has also purchased two hundred acres of ground, extending from the factory to the Lincoln Highway, on which it plans to build 1,200 houses for the workmen; 71 of these houses in "Paruso Park" are already finished or are nearing completion.

PLANT OF THE PENNSYLVANIA RUBBER CO., JEANETTE, PENNSYLVANIA.

NEW INCORPORATIONS.

Allen Tire & Rubber Co., December 30, 1919 (Delaware), $1,000,000. M. L. Horty; S. L. Mackey; M. C. Kelly—all of Wilmington, Delaware.

Andover Rubber Co., November 17, 1919 (Massachusetts), $300,000. A. A. Gleason; J. J. Higgins, both of 60 State street, Boston; F. B. Carlisle, Andover—all in Massachusetts. Principal office, Andover, Massachusetts. To manufacture and deal in automobile tires.

Arrow Tire & Rubber Co., October 20, 1919 (Delaware), $50,000. C. B. Bishop; S. H. Baynard, Jr.; A. M. Fox—all of Wilmington, Delaware. Delaware agent, Delaware Charter Co., 904 Market street, Wilmington, Delaware. To manufacture and deal in supplies for automobiles, etc.

Becker & Rolfe, Inc., December 10, 1919 (New Jersey), $50,000. C. N. Becker; J. C. Rolfe, both of New Brunswick; R. E. Watson, Highland Park—all in New Jersey. Principal office, 41 Paterson street, New Brunswick, New Jersey. Agent in charge, R. E. Watson. To buy, sell, and generally deal in automobile tires, tubes, etc.

Berman Tire Co., Inc., January 12, 1920 (New York), $5,000. J. Shavelson, 1010 Flatbush avenue; M. E. Levine, 1150 President street, both in Brooklyn; S. Berman, 242 West 48th street, New York City—all in New York. To deal in tires.

Burrows, Archer & Roberts, Inc., December 30, 1919 (New York), $20,000. W. Burrows, 63 Park Row, New York City; W. L. Archer, Mt. Vernon; E. S. Roberts, Crestwood—all in New York. To manufacture tires and rubber goods.

Carlisle Tire Corp., November 13, 1919 (Delaware), $3,000,000. J. S. Bretz; H. Von Briesen; E. M. Simpson—all of New York. To manufacture tires, casings, etc.

Corona Cord Tire Co., November 26, 1919 (Pennsylvania), $500,000. T. Phillips, Jr., president; H. B. Callahan, vice-president; C. H. Miller, secretary and treasurer; J. V. and E. Ritts, B. D. Phillips and A. C. Fisher, directors. Principal office, East Butler, Pennsylvania. To manufacture cord tires and inner tubes.

Dixie Rubber Co., November 26, 1919 (Mississippi), $1,000,000. T. J. Graham, Indianola; J. W. Peyton and J. M. Clower—both of Dyer; E. N. Case, Sunflower; L. C. Cadenhead, Mahned—all in Mississippi; N. C. Elliott and T. Kirk—both of Memphis, Tennessee. Principal office, Jackson, Mississippi. To manufacture, buy and sell automobile tires and inner tubes and rubber goods, etc.

Doyle-Gearhart Tire Co., October 1, 1919 (California), $25,000. H. S. Doyle; J. W. Gearhart; P. H. Bottoms. Principal office, Fresno, California. To deal in automobile tires and accessories.

Elasticap Co., The, September 25, 1919 (New Jersey), $125,000. J. C. Farr, president, 75 Tenth street; J. B. Hamilton, vice-president, 1110 Park avenue; E. C. Farr, treasurer, 939 Washington street—all of Hoboken; A. T. Bruce, secretary, 789 Jackson Road, North Bergen—both in New Jersey. Principal office, 702 Clinton street, Hoboken, New Jersey. Agent in charge, W. C. Farr. To manufacture and sell mechanical and electrical goods and devices and particularly a patented rubber splice-insulator known as "Elasticap" to replace the rubber elastic tape now used for end-splices in fixtures, outlet boxes, etc.

F. & G. Tire Co., Inc., December 30, 1919 (New York), $5,000. W. P. Fraley, Jamaica; L. A. Giegerich, Jr., Riverdale on Hudson; C. J. Brown, Great Neck—all in New York. To deal in tires.

Globe Webbing Co., Inc., January 3, 1920 (New York), $30,000. B. L. Pearlman, 26 West 43rd street; G. W. Covert, 274 East 165th street, both in New York City; E. H. Pearlman, 285 St. Johns Place, Brooklyn—all in New York. To manufacture webbing, etc.

Grand Rapids Tire & Rubber Corp., January 7, 1920 (Michigan), $3,000,000. F. G. Withrow; M. J. Goldnir, both of Grand Rapids; L. A. Brown, Alto—all in Michigan. To manufacture automobile tires, etc.

Howe Rubber Corp., September 29, 1919 (Delaware), $18,000,000. T. L. Croteau; H. E. Knox; S. E. Dill—all of Wilmington, Delaware. To import, export and deal in crude and refined rubber and other products.

India Machine & Rubber Mold Co., The, January 1, 1920 (Ohio), $100,000. W. C. Wenk, president and treasurer; N. C. Williams, vice-president; G. T. Williams, secretary and general manager; F. Wolford; R. L. Kryder, directors. Principal office, Akron, Ohio. To manufacture special rubber machinery, cores, molds, etc.

Indian Tire & Rubber Co., November 20, 1919 (Delaware), $1,000,000. T. L. Croteau; P. B. Drew; H. E. Knox—all of Wilmington, Delaware.

Le Doux Rubber Co., November 17, 1919 (Delaware), $1,500,000. T. L. Ernst; L. S. Dumensil; J. J. Mechan—all of New York. To manufacture articles made of rubber.

Mandleberg Rainwear Co., Inc., The, December 31, 1919 (New York), $750,000. J. N. Kennedy, president and treasurer; C. F. Nield, vice-president; A. Davies, secretary. Principal office, 42 West 23rd street, New York City. To manufacture raincoats.

National Rubber & Belting Co., December 6, 1919 (West Virginia), $25,000. Homer and B. H. Wiseman; E. J. Jarroll; C. M. Dunnavant; R. Higgins—all of Charleston, West Virginia. Principal office, Charleston, West Virginia. To buy, sell and deal in mechanical rubber goods, etc.

National Rubber Corp., November 3, 1919 (California), $25,000. K. C. Cooper, manager. Principal office, 1003 South Figueroa street, Los Angeles, California. To deal in rubber goods.

Newtown Tire Co., Inc., January 22, 1920 (New York), $100,000. M. M. Burnet, 19 East Ninth street; J. F. Brandenberg, 111 West Eleventh street, both of New York City; G. A. Senior, Arlington, New Jersey. To manufacture tires.

Pocono Rubber Cloth Co., The, December 18, 1919 (New Jersey), $500,000 N. E. Bowman; T. S. Cart, both of Mt. Vernon, New York; R. H. Gulliver, Trenton, New Jersey. Principal office, 137 East State street, Trenton, New Jersey. Agent in charge, F. R. Brace. To manufacture rubberized cloth and other fabrics.

Portage Tire & Rubber Co., January 7, 1920 (New York), $100,000. S. B. Howard; G. V. Reilly; R. K. Thistle—all of New York. To deal in rubber tires, etc.

Puncture-Proof Pneumatic Tire Protector, Inc., October 1, 1919 (Delaware), $75,000. S. B. Howard; A. W. Britton, G. V. Reilly—all of New York. To manufacture and sell devices of all kinds for the protection of tires.

Ramo Tire & Rubber Co., September 23, 1919 (Delaware), $1,000,000. S. G. and D. Bear and C. K. Weter—all of Pittsburgh, Pa. To manufacture and sell tires and tubes.

Red Seal Rubber & Cement Co., The, December 4, 1919 (New Jersey), $250,000. George B. and Clarence A. Wilson, both of 19 Burgess place; W. A. Wilson, Second and South streets—all of Passaic; J. H. Smith, Jr., [illegible] Washington avenue, Rutherford—both in New Jersey, R. C. Wilson, 157 West 47th street, New York City. Principal office, Second and South streets, Passaic, New Jersey. Agent in charge, C. A. Wilson. To manufacture, buy and sell all kinds of patent rubber, cement, etc.

Rosbach & Bros., J. H., September 15, 1919 (Delaware), $4,000,000. H. R. Limburg; W. A. Hirsch; W. J. Mayer—all of New York. To deal in hides, skins, rubber goods, etc.

Rubber Trading Co., Inc., September 26, 1919 (Delaware), $500,000. T. L. Croteau; H. E. Knox, S. E. Dill—all of Wilmington, Delaware. To import and export rubber, etc.

Sinclair Rubber Co., Inc., September 16, 1919 (New York), $25,000. C. M. Pyle, president; I. J. Solomon, vice-president; E. P. Brown, secretary and treasurer. Principal office, 1679 Broadway, New York City. To remold tires.

Slohm Tire & Mould Co., Inc., January 8, 1920 (New York), $10,000. H. Raflovich; L. Slohm; W. Hartsberg—all of Buffalo, New York. Principal office, Buffalo, New York. To manufacture tires.

Tomah Rubber Works, September 24, 1919 (Wisconsin), $25,000. L. Hofmeister, president and treasurer, 174 Sixteenth street; C. E. Gage, vice-president, 881 Eleventh street; M. E. Prentiss, secretary, 1101 North avenue—all of Milwaukee, Wisconsin. Principal office, Milwaukee, Wisconsin. To manufacture, buy, sell and deal in rubber tubes, tires, and rubber specialties.

Union Rubber & Asbestos Co., January 3, 1920 (New Jersey), $50,000. D. M. Lovett, Trenton, New Jersey; C. H. Swoger, Pittsburgh; J. M. Shear and R. A. Mackie—both of Bradford; H. M. Prill and D. W. Mackie—both of Warren—all three in Pennsylvania. Principal office, 224 South Warren street, Trenton, New Jersey. Agent in charge, D. M. Lovett. To manufacture, buy, sell and deal in all goods, merchandise, and articles made wholly or in part of rubber.

Universal Rubber Goods Co., October 30, 1919 (Delaware), $1,000,000. A. W. Britton; S. B. Howard; G. V. Reilly—all of Wilmington, Delaware. To manufacture and build tires of rubber or metal.

Weinman Elastic Web Co., October 17, 1919 (New York), $50,000. L. Weinman; J. P. Segal; H. Danziger—all of 258 Broadway, New York City. To manufacture braid, lace and webbing.

West Side Auto Tire & Supply Co., November 28, 1919 (New Jersey), $25,000. Walter and Thomas Troy, both of 226 Wilkinson avenue; W. Russ, 444 Jersey avenue—all of Jersey City, New Jersey. Principal office, 746 West Side avenue, Jersey City, New Jersey. Agent in charge, W. Russ. To deal in autos, tires, etc.

Wigg Tire Corp., January 5, 1920 (New York), $100,000. C. and M. E. Wigg, both of Nutley, New Jersey; B. W. Everett, 1 Nassau street, New York City. To manufacture tires, etc.

VICE-PRESIDENT IN CHARGE OF SALES.

A. G. Partridge, recently elected vice-president in charge of sale and a director of the Firestone Tire & Rubber Co., Akron, Ohio, has been in the tire business since its infancy. Born in Jamestown, New York, he began his rubber career with the Diamond Rubber Co., Akron, Ohio, in 1899. Six years later, while in charge of the New York Diamond branch, he resigned to join the Firestone sales force. His advancement thereafter was rapid. In 1911 he was appointed assistant sales manager, in which capacity he visited the principal cities of the country developing new avenues of trade and promoting enthusiasm among the branch offices. On the election of R. J. Firestone to a vice-presidency in 1916, Mr. Partridge succeeded him as general sales manager, which position he held during the company's greatest growth and up to his own election to the directorate. He has been well prepared for his larger responsibilities by those he has carried for the company in the past, and his election is in accord with the Firestone policy of advancing men who have made good. His entire career has been in sales work, and in that side of the firm's activities he will continue.

A. G. Partridge.

JOHN W. THOMAS, VICE-PRESIDENT.

John W. Thomas, newly elected vice-president in charge of manufacturing of the Firestone Tire & Rubber Co., Akron, Ohio, has been with the company for twelve years. He has been works manager for some time and responsible for production since 1911. Having made his way up through the production end of the plant, he is well fitted for his larger work by intimate knowledge, experience and conspicuous ability.

John W. Thomas.

A native son of the Buckeye State, Mr. Thomas was born in Tallmadge, Ohio, in 1880. He spent his boyhood days on a farm, entering Buchtel Academy at the age of 17, and completing his education at Buchtel College, from which he graduated in 1904 with a degree of Ph. B. Shortly after graduation he entered the laboratory of The B. F. Goodrich Co., Akron, Ohio, where he spent three years in research and experimental work. In January, 1908, he joined the Akron, Ohio, organization of the Firestone Tire & Rubber Co. and installed its laboratory, where he served as chemist for two years, going thence to the manufacturing department, serving an apprenticeship in one tire manufacturing unit after another, and becoming manager of one of the departments. In 1911 he was appointed superintendent of the factory, and in 1916 he was elected a member of the board of directors of the company. As chairman of the solid tire division of the War Service Committee of the Rubber Industry of the U. S. A. he has earned the gratitude of the trade. Mr. Thomas makes his home in Akron, is married and has four children, two boys and twin girls. He is a member of the Congregational Church, of the Lone Star Fraternity, the Portage Country Club, Akron City Club, Rotary Club, Ohio Society of New York, Society of Automotive Engineers, Knights of Pythias, and the Akron Chamber of Commerce, of which last organization he is a director.

PERSONAL MENTION.

Victor W. Fink, for the last ten years connected with the Rubber Importers' & Dealers' Co., Inc., New York City, has been placed in charge of the crude rubber department of the firm of E. S. Kuh & Valk Co., Produce Exchange Building, New York City.

R. W. Wheeler, Bush Terminal, Brooklyn, New York, has been appointed representative in the State of New York for the Cleveland Osborn Manufacturing Co., authorized to do business in New York.

Thomas F. Hetherman, formerly connected with Neuss Hesslein & Co., Inc., on January 1 formed a new corporation with Robin & de Laurant, under the name of Hetherman & Co., Inc., at 487 Broadway, New York City, as a broker specializing in Far Eastern produce.

J. E. Mayl, who has been New England district sales manager of the Firestone Tire & Rubber Co., Akron, Ohio, with headquarters in Boston, has been promoted to Eastern sales manager with headquarters in New York City, replacing Lewis G. Fairbanks, who has been elected vice-president and general manager of the Firestone Steel Products Co., manufacturers of rims, etc.

J. V. Mowe, formerly assistant general sales manager of the Kelly-Springfield Tire Co., has been promoted to the position of general sales manager, succeeding Otis R. Cook, who has been connected with the company for the past nine years and has been vice-president and general sales manager for the past six years. Mr. Cook will remain in Cleveland, Ohio, looking after special work for the company as well as cooperating with the financial interests in New York City, and will retain all of his stock in the corporation and remain on the board of directors.

W. H. Bell has been appointed assistant general sales manager of the Kelly-Springfield Tire Co.

EASTERN AND SOUTHERN NOTES.

The Kelly-Springfield Tire Co. is about to commence the erection of a 16-story office building in New York City, to which it will remove the general sales department which has been located in Cleveland, Ohio, and where the executive offices of the company will be established.

The Beacon Tire Co., Inc., Beacon, New York, has completed its three-story addition and equipped it with machinery of the latest type.

The Burnet-Webb Tire Corp., 518 South Clinton street, Syracuse, New York, has taken over exclusively the Syracuse branch of the Sterling Tire Corp., Rutherford, New Jersey, where, in addition to the wholesale distribution of Sterling tires and tubes, it will retail standard makes of tires, tubes, and accessories. The officers of the company are: William E. Housel, president; Arthur E. Webb, vice-president in charge of territorial dealer business; J. H. Burnet, secretary and treasurer in charge of sales and service.

The Mutual Tire & Rubber Co., New York City, has opened at Springfield, Massachusetts, and New Haven, Connecticut, retail and sporting goods departments in its branches in those cities. The company operates a chain of automobile tire, accessory, and supply stores.

The Forrest Tire & Rubber Co., Shubert Building, Philadelphia, Pennsylvania, has been incorporated under the laws of Delaware with 1,000,000 shares of fully paid and non-assessable shares of common stock at a par value of $1, with the following officers: R. E. Connor, president; Olie T. Alveberg, vice-president Abraham Mitnick, secretary and treasurer. Rudolph Shlifer is general manager and Samuel G. Grossley, engineer.

The Archer Cord Tire Sales Co., Louisville, Kentucky, at its recent annual meeting elected the following officers: W. F. Bigelow, president (reelected); W. A. Bieter, vice-president; Maurice Hessian, secretary and treasurer; Frederick Graham, chairman of the executive committee.

The Dixie Rubber Co., 768-770 Randolph Building, Memphis, Tennessee, recently incorporated under the laws of Mississippi, expects to begin construction of its plant in Memphis in April. Arrangements for the building and equipment have been completed and the company hopes to begin production of cord and fabric tires and inner tubes in the autumn.

FOOTWEAR PRICES INCREASE.

Price announcements on footwear made on January 1 by the United States Rubber Co. for the current year show an average increase of approximately twenty per cent on the full line.

On January 1, 1919, the company's footwear prices were reduced, the average cut for the whole line being about five per cent. This price reduction followed closely the decrease in the cost of materials that came soon after the signing of the armistice. During the past year the cost of these materials mounted to even higher levels than during the war, and the increase in footwear prices which has recently gone into effect is a result of the higher cost of materials and labor.

Taking the five per cent reduction of a year ago into consideration, the average increase in price for the two-year period of 1919-1920 is only fifteen per cent.

THE RUBBER TRADE IN NEW JERSEY.

By Our Regular Correspondent.

TRENTON NOTES.

The managers and foremen of the Thermoid Rubber Co., Trenton, recently held their second annual banquet and entertainment at Hildebrecht's. T. A. Welger, superintendent of the factory, was presented with a handsome amethyst ring by his foremen. Members of the committee in charge comprised John Coleman, T. A. Welger, A. D. Nevins and E. L. Royal.

The Trenton rubber manufacturers responded liberally to the fund raised for the poor children of Trenton during the holiday season. The children were given an entertainment in a local theater and each one presented with pretty gifts.

The recent round-up of "Reds" in Trenton and vicinity found but a handful of radicals employed in the rubber plants, and these men were finally released by the Government authorities.

The Puritan Rubber Manufacturing Co., whose plant on Perrine avenue, Trenton, was recently destroyed by fire, has taken out a building permit for the erection of new works on the old site. The building will be one story brick, 28 by 128 feet in size, and will cost $7,500.

The Luzerne Rubber Co., Trenton, has purchased a tract of land, 200 by 200 feet feet, opposite its works on Muirhead avenue and intends later to enlarge the plant.

The Joseph Stokes Rubber Co., Trenton, has contributed $250 to the police pension fund of Trenton.

Alfred Whitehead, secretary of the Whitehead Brothers Rubber Co., has been ill at his home in Trenton.

The seventy caddies employed at the Trenton Country Club were recently given a dinner at the club, where gifts were also presented. John A. Lambert, treasurer and general manager of the Acme Rubber Manufacturing Co., acted as chairman of the affair.

William J. R. Stokes, treasurer of the Thermoid Rubber Co., Trenton, has been apointed a member of the Trenton Sinking Fund Commission. Mr. Stokes was formerly city treasurer of Trenton.

The Union Rubber & Asbestos Co. has been incorporated and has opened an office at 224 South Warren street, Trenton. The company will deal in mechanical rubber goods and asbestos products of all kinds, especially the rubber goods used in the oil business. The officers of the new concern are: Donald W. Mackie, president; J. M. Shear, vice-president; Charles E. Day, sales manager; Harry M. Prill, treasurer; Charles H. Swoger, secretary, and D. M. Lovett, general manager. Mr. Swoger has been in the rubber business for the past twenty years. The company will soon employ a force of salesmen in Pennsylvania and the southwestern oil districts, as well as in other parts of the country.

Horace B. Tobin, secretary and treasurer of the United & Globe Rubber Co., Trenton, has been made a director of the Standard Fire Insurance Company.

The Crescent Insulated Wire & Cable Co., Trenton, will build on recently acquired property a one-story factory addition of steel and concrete, 50 by 125 feet, to cost, with equipment, about $40,000.

The Netherlands Gutta Percha Co., Singapore, manufacturer of rubber goods, has let a contract in Trenton for a large supply of transfer patterns for the stamping of tubes and radiator hose.

MISCELLANEOUS NEW JERSEY NOTES.

The Overman Cushion Tire Co., Belleville, New Jersey, has plans drawn for a two-story factory, 64 by 120 feet, at Cortlandt and Rutgers streets.

The Rydon Tire & Rubber Co. has let a contract for the erection of a brick and steel factory building at Fourth and Railroad avenues, Asbury Park, New Jersey, to cost $100,000. The structure will be 75 by 185 feet.

The Pocono Rubber Cloth Co., manufacturers of rubberized cloth for automobile tops and various specialties, has purchased the plant of the Howard Demountable Rim Co., in Hamilton Township, New Jersey, and will establish a large factory there. The property consists of three acres and a manufacturing plant 90 by 170 feet. The Pocono company has also obtained options on adjoining lands along the main line of the Pennsylvania Railroad for future use. The plant cost the Pocono company $45,000. About 100 hands will be employed.

Brighton Mills, Inc., Passaic, New Jersey, has devised a service button for employes who remain with the company and serve full time except for illness or other excusable absence. The button given at the end of one year is of blue enamel with gilt lettering; second year, bronze; fifth year, silver; tenth year, gold. The design consists of the monogram "B. M." in a central circle; the words 'Brighton Mills" in an intermediate one; and the words "Loyalty," "Cooperation," and "Fellowship" in the outermost one which is indented between the words.

TRENTON RUBBER MANUFACTURERS' ASSOCIATION.

This association has been in existence a little over four years and has resulted in much benefit to the local rubber manufacturers, all of which are members. The roster of the association includes the Acme Rubber Manufacturing Co., Ajax Rubber Co., Inc., Bergougnan Rubber Corp., Essex Rubber Co., Empire

ANNUAL MEETING AND BANQUET OF THE TRENTON RUBBER MANUFACTURERS' ASSOCIATION AT THE TRENTON COUNTRY CLUB.

Rubber & Tire Co., Globe Rubber Tire Co., Hamilton Rubber Manufacturing Co., Home Rubber Co., Crescent Insulated Wire & Cable Co., Luzerne Rubber Co., Semple Rubber Co., Joseph Stokes Rubber Co., Thermoid Rubber Co., United & Globe Rubber Co., Whitehead Bros. Rubber Co., Mercer Rubber Co., all of Trenton, and the Vulcanized Rubber Co., Morrisville, Pennsylvania; Quaker City Rubber Co., Philadelphia, Pennsylvania; Electric Hose & Rubber Co., Wilmington, Delaware.

Meetings are held every two months except during the summer period. Matters of particular as well as general interest are discussed at these meetings, and the friendly intercourse arising has been of much benefit in many ways to the members. The labor turn-over was one of the first matters given attention, and after a short time this feature of economic waste was very much reduced.

The bi-monthly meetings are always held in the evening, when those present partake of the famous cuisine of the Trenton Country Club.

The annual meeting held December 8, and names of officers elected at that time were recorded in THE INDIA RUBBER WORLD January 1, 1920.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE FIRST MONTH of the new year found the manufacturers of rubber goods in Rhode Island ready for a continuance of the season of great prosperity that has been unprecedented for the past four years. Everything is favorable to the year 1920, exceeding any previous twelve months in the history of the industry. Orders on hand are sufficient to justify this prophecy, but the labor situation continues to cause the manufacturers of rubber goods, in common with practically all other lines, considerable worry. Practically every plant in the State is looking for, but only in comparatively few cases, is finding, experienced help. And this, notwithstanding the substantial increases that have recently been made in the wage schedules.

The Atlantic Tubing Co., of Knightsville, is giving free life insurance to all its employes who have been with the concern six months or more. The initial amount of insurance issued to any employe is $500, and this amount increases each year by $250 until a maximum of $1,000 is reached. A blanket policy covers all the lives, and each person insured is presented with a certificate. He names his beneficiary in the same manner as he would under an ordinary policy, and has the provilege of changing the beneficiary as circumstances demand. No medical examination is required.

One of the largest and most important mill plant purchases that have occurred in this state in many months was consummated recently when the plant of the Greene & Daniels Co. of Pawtucket was transferred to the Ninigret Mills Co. of Boston, the majority stock of which is owned by The Fisk Rubber Co., of Chicopee Falls, Massachusetts. This concern is a newly formed Massachusetts corporation. with a capital stock of $3,000,000, divided into $2,500,000 preferred and $500,000 common stock. J. A. Brander, of Brander & Curry, Inc., New York city, is president; Charles F. Broughton, treasurer of the Wamsutta Mills, New Bedford, Massachusetts, vice-president; H. T. Fisk, of The Fisk Rubber Co., treasurer; Henry Otte, first assistant treasurer; Charles S. Fowler, second assistant treasurer; Arthur Houghton, secretary, and John E. Searle, clerk.

The company will operate two plants for the manufacture of automobile tire yarns and fabrics, one being located at Pawtucket and the other at Westerly. The Ninigret Mills, at Westerly, which will be operated under the direction of Mr. Fowler, are already equipped with twisting, spooling and weaving machinery, but 20,000 spindles are to be added at an expense approximating $1,000,000 and a new building, to cost $500,000, is to be erected which will afford facilities for the employment of some 700 persons. This plant will have an annual capacity of 250,000,000 pounds of tire fabrics, and will carry an annual payroll of nearly $1,000,000.

The Greene & Daniels plant is located on Central street, and employs about 600 textile workers. It will be under the direction of Mr. Otte, and is to be thoroughly overhauled and arranged for the production of tire yarns and fabrics.

January was a busy month at the plant of the National India Rubber Co., Bristol, because of numerous conferences of the committees on industrial relations and employes' welfare; conferences of sales forces and department heads, and other activities, together with material improvements of the plant, and the unusual business activities.

At a conference of the committees on industrial relations of the rubber factories controlled by the United States Rubber Co., held at the National factory, there were inspections and comparisons of plans. The physicians, dentists, and nurses of the factories also held a convention the same day at the DeWolf Inn at Bristol, when papers were read by several, including Dr. M. J. O'Brien, dentist at the Bristol plant, who spoke on "Industrial Dentistry."

In line with other improvements in the welfare work at the National factory, the circulating library, which the company has maintained for the benefit of its employes for a long time, is to be materially enlarged, the demands upon its facilities having increased to a considerable extent in the last few months.

A powerful pump for use in bringing salt water from Bristol harbor to the National factory has been set in place at the pumping station on Thames street, greatly increasing the factory water supply.

Mrs. Augusta Mapes, who was employed at the National factory for more than 40 years as overseer in the clothing and other departments, previous to some ten years ago, died at the Home for Aged Women in Bristol on January 11, in her 87th year.

The Revere Rubber Co. continues to extend and improve its plant on Valley and Hemlock streets, Providence, and has recently purchased several additional tracts of land, so that the holdings of this concern have increased considerably during the past year. The company is now erecting for storage purposes a three-story fireproof building of steel, brick and concrete on Hemlock street. It is 120 feet by 110 feet, and work is being pushed as rapidly as possible. The company is also building an addition to one of its two-story factory buildings on Eagle street.

The Kokomo Tire Co., a corporation to deal in motor cars, tires and accessories, in Providence, with a capital stock of $10,000, has been granted a charter under the laws of Rhode Island. The incorporators are Maurice Robinson, David C. Adelman and Charles M. Robinson.

The National Rubber Co., 36 Franklin street, Providence, has been purchased by Amedo Morville and Carlo Morville, who will continue the business.

Ludger Goyer and Gustave Grandine have filed their statement with the city clerk of Central Falls, that they are the owners of the Reliable Vulcanizing & Tire Co., 575 Dexter street, that city.

The firm of Albert Bliss & Co., has been incorporated under the laws of Rhode Island, and organized as the Bliss Rubber Co., and will continue business at 130 Empire street, Providence. Albert Bliss is president and general manager, and the firm will handle Racine tires.

The Columbia Narrow Fabric Co., manufacturers of elastic webbing at Shannock, is planning an addition to increase the plant's operations. The concern recently negotiated for the purchase of the Carmichael Mill property at Shannock.

Three new mills are to be added to the plant of the Tubular Woven Fabric Co., Pawtucket, to adjoin the present property at Main and Carver street and to extend to the Pawtucket river. One of the structures will be of brick, four stories high, 58 by 183 feet, and the other two buildings will be one story high, 99 by 37 feet, and 60 by 105 feet, respectively. The estimated cost of the new buildings will be $200,000.

The New England Elastic Braid Co., 18 Broadway, Pawtucket, is owned by Mrs. Agnes Coucher of that city, according to her statement filed at the city clerk's office.

W. Maxwell Reed, for the past year and a half plant manager of the American Wringer Co., at Woonsocket, has resigned. John F. Sweeney, assistant plant manager and sales agent, will fill the position temporarily.

The Broadway Tire Exchange, 107 Broadway, Providence, has changed the firm name to Millers, Inc., the new officers being David Miller, president; Bernard H. Miller, treasurer and general manager; Henry J. Miller, vice-president, and Samuel Miller, secretary. Charles E. Angell and Angelo Uranoli, formerly of the Broadway Tire Co., Providence, have taken over the vulcanizing department and have opened a shop at 50 Broadway.

Trial of the suit of the I. T. S. Rubber Co., of Elyria, Ohio, against the United Lace & Braid Manufacturing Co., of Providence, in which the plaintiff alleges infringement of a patent on a rubber heel, was heard in the United States District Court before Judge Arthur L. Brown early in the month. The plaintiff asked that the court grant a permanent injunction, restraining the defendant from the further use of the heels in controversy, and also for an accounting and settlement from the defendant company of the sales of rubber heels which the plaintiff declares are an infringement on their patent rights. The case was taken under advisement.

THE RUBBER TRADE IN MASSACHUSETTS.

By a Special Correspondent.

The ninth annual convention of the National Shoe Retailers' Association, held in Mechanics' Building, Boston, January 12, 13, 14 and 15, proved to be a triumph, exceeding in attendance, number of exhibitors and of important addresses all previous gatherings of the association. Some 6,000 buyers from all parts of the country overtaxed the capacity of the city's hotels. At the various business sessions many timely talks were given by leaders in the industry, some with motion picture, the subjects treated including general business and market conditions, style and price tendencies, mainufacturing and sales problems, etc.

Interested centered, however, in the manufacturers' exhibits in Paul Revere Hall, where the rubber industry was well represented by the following firms displaying rubbers, rubber boots and overshoes, rubber and fabric shoes, rubber heels and fiber soles and machinery: Beacon Falls Rubber Shoe Co., Beacon Falls, Connecticut; Cambridge Rubber Co., Cambridge, Massachusetts; Firestone Tire & Rubber Co., Akron, Ohio; United Shoe Machinery Co., Boston, Massachusetts; Foster Rubber Co., Boston, Massachusetts; The B. F. Goodrich Co., Akron, Ohio; The Goodyear Tire & Rubber Co., Akron, Ohio; Hood Rubber Co., Watertown, Masachusetts; Plymouth Rubber Co., Canton, Massachusetts; United Lace & Braid Manufacturing Co., Providence, Rhode Island.

Two miniature rubber shoe factories operated in the basement of Mechanics' Building by the United States Rubber Co. attracted much attention. Expert shoemakers demonstrated how rubber shoes and white canvas fiber-soled shoes are made, starting with the crude rubber and going right through to the finished product.

The second evening, the Style Show, one of the most popular features of past conventions, was repeated in elaborated form. Beautiful young women, appropriately costumed, paraded along the broad, elevated "Chemin des Dames" and other war-named avenues, and mingled with the crowd displaying the newest styles in all sorts of footwear. To show the latest dictum in rubber and fabric sport shoes, there were bathing girls, tennis girls, golfing girls and basket-ball girls. Children's and men's canvas footwear were also shown.

The convention came to a close Thursday evening with a banquet in Convention Hall, at which Governor Calvin Coolidge and Senator David I. Walsh, of Massachusetts, were the principal speakers. The next national footwear convention will be held at Milwaukee, Wisconsin.

Some 800 foremen in the footwear division of the United States

Rubber Co. held their second annual convention in Boston, December 29 and 30, for the purpose of discussing technical and production problems of the industry with the aim of standardizing methods of operation in the various factories.

The supervisory forces of 17 different footwear factories operated by the company in Cambridge, Malden, Melrose, Stoughton and Millville, Massachusetts; Bristol and Woonsocket, Rhode Island; New Haven, Naugatuck, Waterbury and Milford, Connecticut; New Brunswick, New Jersey; Williamsport, Pennsylvania; St. Louis, Missouri; and Hastings, Michigan, were represented.

The convention opened with a general session in Ford Hall at which Myron H. Clark, general factory manager of the footwear division, presided. Homer E. Sawyer, vice-president of the company, spoke on industrial relations; C. R. Haynes discussed technical factory problems; George L. Lawrence, production factory manager, touched upon the problems of quantity production; C. T. McCarthy, general manager of the Naugatuck factory, outlined the use of charts and statistics in factory administration, and A. T. Hopkins, service manager, led a discussion on industrial relations.

During the afternoon and the next day the convention was dwivided into departmental groups for luncheon in the various hotels and discussion of common problems. The first evening a smoker and entertainment was given in Ford Hall, at which the National India Rubber Co. Band, of Bristol, Rhode Island, played under the direction of F. E. Essex. The convention came to a close the second evening with a reception and banquet given to the officials of the company at the Copley-Plaza Hotel, the guests including Charles B. Seger, president; Homer E. Sawyer, vice-president; Myron H. Clark, general footwear factory manager; George H. Mayo, general manager of sales, and C. W. Barnes, general sales agent. Topical songs were rendered by the various factory groups, each under the direction of a cheer leader. Spare moments during the two days were devoted to sightseeing trips to points of interest about the city.

Realizing that a knowledge of English means better opportunities and more comforts of life to the immigrant, the Hood Rubber Co. plans to make a wide-spread campaign in Americanization work. Census cards have been given to the foremen in each department. Every foreigner is being interviewed personally. Teachers from Cambridge and Watertown have been secured; class-rooms in different parts of the plant have been arranged; books and equipment purchased; meetings with motion picture films, and classes conducted by Mr. Mahoney in charge of the State Americanization Work and George Quinby, of the Associated Industries of Massachusetts, are being held in the restaurant. The classes chosen for this work are made up of men and women chosen from different parts of the plant, and the intelligence and interest shown by them only too conclusively proves that there is a boundless field for this work, and an infinite amount of good can be done for the people of foreign birth who have become a part of the community.

The Mulconroy Co., Philadelphia, Pennsylvania, manufacturer of metallic hose, etc., opened, on January 1, a branch store at 85 Purchase street, Boston, Massachusetts, through which to handle the New England trade.

At the recent annual meeting of Aleppo Temple, Ancient and Accepted Order of Nobles of the Mystic Shrine, Francis H. Appleton, of F. H. Appleton & Son, Inc., reclaimers, and Joseph H. Work, dealer in lasts for rubber shoes, were elected respectively assistant rabban and treasurer. Both have long been prominently identified with various Masonic bodies in Boston.

Dr. Robert S. Quinby, service manager of the Hood Rubber Co., Watertown, has been elected president of the Employment Managers' Association, an organization composed of an extensive membership of men selected from New England industries to make a detailed investigation of better employment relations.

The various organizations headed by George N. Tougas have taken the entire second floor at 161 Summer street, Boston, for headquarters and main sales offices. The Tougas organizations include the Tougas Shoe Co., Boston, shoe jobbers; the Salem Die Co., Salem, die manufacturers; George N. Tougas, Boston, shoe and rubber manufacturers' supplies. Mr. Tougas is also a director of the Brockton Trust Co., Brockton, Massachusetts.


GEORGE N. TOUGAS

The demand for Killion cushion heels is such that the Killion Rubber Co., Dorchester, will discontinue its mechanical and all other lines and continue its efforts to heels alone. Various alterations have been made in the plant, a new mixer, presses and other equipment have been installed, and the company will soon be in a position to double its present production.

Owing to the death of L. L. Cheney, Boston, salesman for the Clifton Manufacturing Co., manufacturers of clothing, carriage cloth and proofed fabrics, at Jamaica Plain, the firm will temporarily be represented in this territory by I. M. Post and T. Frank McCarthy, its New York City salesmen.

Frank A. Vanderlip, a director of the United States Rubber Co., and one time assistant secretary of the treasury, in a recent address before the Old South Meeting House Forum, attributed chiefly to the excessive issue of paper money by the United States and other countries during the war the present high prices and declined purchasing power of the dollar. He urged "spiritual regeneration" as the remedy and asserted the need to deflate by self-denial, although it would test the character of the nation to accomplish it.

With the organiaztion of the Tyrian Service Association by employes of the Tyer Rubber Co., Andover, there begins another interesting experiment in industrial relations. The preamble to the constitution sets forth the belief that employers and employes have common interests, and that all problems can be solved and permanent prosperity assured by this considerate and earnest cooperation. The employes therefore undertake by frank discussion and earnest effort to solve the problems confronting the Tyer Rubber Co. and themselves in order to promote their common welfare and to advocate sound Americanism in such a way as to serve the community, commonwealth and nation.

The business of the association is to be transacted by a committee of twenty-five persons representing the various departments by allotment according to the number of operatives in each. Eight may be elected by the management, eight by the foremen's committee and the balance are to be elected by and from the employe membership. Monthly meetings are to be held, and the committee will serve as the channel of communication between the employes and the company, making such suggestions or recommendations as are deemed advisable. The following matters are regarded as within the scope of discussion by the committee: General welfare of the employes and the company; methods and equipment; output and cost; working hours; wages and economy; misunderstanding between the company and the employes; suggestions.

A recent survey of the operatives of the plant gave the following result regarding citizenship: Number of citizens, 81.2

per cent; number holding first place, 10.2 per cent; number of aliens, 8.6 per cent. Nearly all are of English speaking stock.

The Athol Manufacturing Co., Althol, Massachusetts, manufacturer of pneumatic rubber goods, announces that a new company will soon be formed to conduct the business of its Metropolitan Air Goods Department. Richard A. Whall, formerly secretary and treasurer of the Metropolitan Air Goods Co., originally at Reading, Massachusetts, is air goods manager of the Athol Manufacturing Co., and many new articles of his design have been placed on the market.

The Taunton Rubber Co., Taunton, reports that its 1919 business, notably in "Peerless" heels, was double that of 1918. A new high grade heel under the brand "Columbia" will soon be placed on the market. Three salesmen are introducing these goods to the trade, namely, W. Gomberg, Frederick Eppler and Harry Crossman. The officers of the company remain as in the past, William L. Gifford, president; Joseph L. Gifford, treasurer.

Several hundred delegates from the National Shoe Retailers' Association convention in Boston were entertained at a luncheon given by M. M. Converse, president of the Converse Rubber Shoe Co., Malden, at the factory restaurant on January 13. They were afterward shown through the plant and displayed much interest in the processes of rubber shoe manufacture.

The new five-story storage addition to the south end of the shipping room is nearly completed. The four-story addition to the north end of the building is also well along. The first floor will enlarge the mill room for Converse tires, while the floors above will be occupied by the receiving department, its former quarters providing needed expansion in the shoe factory.

An oil burning system is being installed at the plant of F. H. Appleton & Son, Inc., at Franklin, Massachusetts, to overcome the coal shortage.

REORGANIZATION OF THE BOSTON BELTING CO.

W. E. Hardy, F. H. Rice, H. H. Whitesel and associates, who have been operating the Boston Belting Corp., so far as production and sales are concerned, have purchased and taken over all assets of the corporation which relate to the mechanical rubber goods business. The Boston Belting Co., whose major assets had been transferred to the Boston Belting Corp. some two years ago, had never been dissolved. Consequently, on November 6, when Thomas A. Forsyth and J. H. D. Smith resigned as directors and as president and treasurer, respectively, their positions were filled by the election of W. E. Hardy, president and general manager; F. H. Rice, treasurer, and H. H. Whitesel, director and sales manager. Therefore, the business is continued without break, inasmuch as the new officers had operated the company for two years prior to its sale, under the management of Mr. Forsyth.

The Boston Belting Co., incorporated under the laws of the State of Massachusetts, was originally established in 1828, incorporated by State Legislative Grant in 1845 as the Goodyear Manufacturing Co., the firm name being changed in 1847 to Boston Belting Co. The present capitalization is $1,015,000; $515,000 preferred issue; $500,000, common. All stock has been issued. Over one-third of all employes are shareholders.

H. H. Whitesel, who grew up in the mining fields of Colorado and Missouri, was engaged in the supply business at Joplin, Missouri, some fifteen years ago. He became identified with the Diamond Rubber Co. in 1908, as field salesman, later becoming St. Louis branch manager and then general mining representative, continuing with the Diamond Rubber Co. until 1915. he then took up the western sales of the Boston Belting Co. and in January, 1918, became general sales manager.

F. H. Rice was an Ohio farmer boy. After spending six years in the machine tool department of the Warner & Swasey Co. of Cleveland, Ohio, specializing in cost accounting, he became identified with the treasury and accounting departments of the Diamond Rubber Co. in 1908, continuing in this position for four years, then joining the organization of the Firestone Tire & Rubber Co. for three years. In 1915 he became assistant treasurer of the Boston Belting Co.

W. E. Hardy, upon his graduation from Buchtel College—now Akron University—spent a few years mining in Arizona and Old Mexico. After a year with the Brown Hoisting Machine Co., of Cleveland, Ohio, he got a "job" operating a belt press with the Diamond Rubber Co. at Akron, Ohio, in 1903, later becoming successively assistant sales manager, New York manager of mechanical sales and general mechanical sales manager at Akron. He joined the Boston Belting Co. organization in 1915.

PORTAGE WORKS MANAGER.

John T. Johnson, works manager of The Portage Rubber Co., of Akron, Ohio, is working out production plans that entail the building of a large new unit to the Portage factory at Barberton, Ohio, to be devoted almost exclusively to the production of cord tires. Work will be started soon on the new structure which is to comprise a header building with three wings, each of which will be 200 by 60 feet and several stories in height.

John T. Johnson.

Mr. Johnson is a graduate of the mechanical engineering college of Cornell University, was for many years with The B. F. Goodrich Co. at Akron. Starting in the cord tire department, he became manager of that department and later was placed in charge of the Goodrich tire experimental department. For a short time he was works manager of the Cord Tire Corp. at Chester, West Virginia, leaving that position to come to the Portage company. He is a keen student of industrial relations and an enthusiastic supporter of athletics for both men and women.

McGRAW'S BALTIMORE BRANCH MANAGER.

L. L. McAnaney, who has been appointed manager of the Baltimore branch of The McGraw Tire & Rubber Company, Cleveland, Ohio, is one of the best known tire men in the country, having been identified with the industry for the past seventeen years.

Mr. McAnaney's position in the tire business is an enviable one, as he by no means started at the top of the ladder. Starting as a stenographer in the factory of The B. F. Goodrich Co. at Akron, Ohio, he was next made a salesman, working the territory around Boston for the Goodrich company. The marked ability of Mr. McAnaney soon won for him another promotion—that of manager of the Goodrich company's Cleveland branch. In Cleveland he was a big success and became one of the most popular tire men in Ohio. For over nine years he managed the Goodrich branch, while for over four years previous to his connection with the McGraw company he served as manager for the Republic Rubber Co., Youngstown, Ohio.

L. L. McAnaney.

Mr. McAnaney's pleasing personality, his energy, and his ability as a tire expert, are certain to win for him and the McGraw company a host of new friends in the Baltimore territory.

THE RUBBER TRADE IN OHIO.

By Our Regular Correspondent.

AKRON NOTES.

The B. F. Goodrich Co. and The Goodyear Tire & Rubber Co. have taken out permits for additions to their plants in Akron to cost nearly $3,000,000. The permit issued to the Goodrich company was for an $800,000 addition, which was followed a few days later by another one calling for the expenditure of $1,400,000.

These permits, company officials state, do not represent the actual expenditure for the buildings to be erected, since they are based upon cost of construction to-day, and it is well known that the cost of all building materials and labor will have advanced a great deal before the work is completed a year hence.

The great question in the minds of the factory managers of both of these companies is where they can house the men to man these plants.

The Portage Rubber Co. recently decided to issue another $1,000,000 worth of capital stock to stockholders. Persons holding five shares of common stock are privileged to purchase one share of the new issue. The capitalization of the company is not to be increased, only $2,500,000 worth of common and $1,300,000 of preferred stock having been issued of the original $10,000,000 authorized. The business of the company has doubled during the past few months.

Akron's $1,000,000 automobile show, held in the largest garage in the world, was a success. The attendance during the week of the show was approximately 35,000. Plans are being made for an even greater show next year.

The Philadelphia Rubber Works Co., Akron, has made arrangements for the construction of a $17,000 addition to its plant. Work will commence on the addition in the very near future. A building permit for the structure has been obtained from the city building department.

Promotions for several sales executives were among the New Year changes in personnel announced by the Firestone Tire & Rubber Co., Akron.

E. W. BeSaw, who has been western sales manager for three years, with headquarters in Akron, becomes the general sales manager, succeeding A. G. Partridge, who was recently made vice-president in charge of sales.

F. K. Starbird, who has been a district sales manager, with headquarters in Minneapolis, succeeds Mr. BeSaw as western sales manager.

L. G. Fairbank, who has been eastern sales manager, with headquarters in Akron, becomes vice-president and general manager of Firestone Steel Products Co.

Paul P. Sheeks, graduate of South Dakota University, and an all-around athlete, has been appointed coach and athletic director of the Firestone Tire & Rubber Co., Akron.

At a special meeting of the stockholders of the Amazon Rubber Co., Akron, steps were taken to increase the capitalization of the company from $400,000 to $1,500,000.

The Miller Rubber Co., Akron, according to F. C. Millhoff, its general sales manager, enjoyed during 1919 the biggest tire year in its history, from the standpoint of production and sales, the increase over the sales of the previous year amounting to approximately 50 per cent.

The coal strike was met by The General Tire & Rubber Co., Akron, by the purchase of an option on a mine of 30 tons, daily capacity for 30 days and asking for volunteers from the employes of the company to mine the coal. Fifty men immediately responded, of whom eight were experienced miners. Trucks were used by the company to carry the coal to the plant.

The business of The General Tire & Rubber Co. amounted to $5,000,000 during the past year, it was announced at the annual meeting of the stockholders of the company recently. This amount is 95 per cent greater than the business during the previous year. The officers of the company who served during the past year were reelected.

The new clubhouse of The Goodyear Tire & Rubber Co., situated near the company plant, will be ready for occupancy about February 1. An appropriate program for the opening is being arranged by the company. The building is probably one of the most pretentious ever erected for welfare work in this country. It is seven stories high and will tower above the surrounding Goodyear buildings. It will contain a gymnasium, a theatre to accommodate 2,000 persons, a swimming pool, a reading room, a library, music rooms, a cafeteria and a film manufacturing department.

One of the floors will be devoted to the Goodyear University, which will be established in the near future. Plans for this educational institution have not yet been completed, but it is believed in well informed circles that instruction will be given which will make it possible for an employe to obtain a degree equivalent to that of doctor of philosophy in the ordinary university.

The H. B. Bixler Co., headed by H. B. Bixler, a consulting engineer with offices in the Ohio Building, Akron, has announced plans for a laboratory and manufacturing testing plant which will sell its services to the smaller rubber companies in the United States. Mr. Bixler's plans include a factory where rubber goods will be manufactured on a small but absolutely commercial scale. The plant which is to be built in Akron during the first months of the new year will cost approximately $600,000.

At the recent directors' meeting of The Williams Foundry & Machine Co., Akron, F. E. Holcomb was reelected president and general manager of the company. Mr. Holcomb was elected president of the concern in 1918, succeeding J. K. Williams in that office. He was formerly manager of the Akron plant of the Kelly-Springfield Tire Co.

F. E. Holcomb.

The other officers of the company are: S. E. Ziliox, vice-president; G. C. Dietz, treasurer, and W. J. Slater, secretary and assistant treasurer; directors, Charles Herberich, Aaron Burnett, and Charles Reymhann.

The Williams Foundry & Machine Co. manufactures tire repair equipment in addition to building machinery and appliances for tire and rubber plants. Its development has been steady and consistent and the treasurer's report for the year just ended states that the business for the preceding fiscal year amounted to more than $2,000,000.

The Portage Rubber Co., Akron and Barberton, Ohio, at the annual meeting of its directors held on January 13, 1920, reelected the following officers: M. S. Long, president; James Christy, chairman of board of directors; J. W. Maguire, vice-president and general manager. The newly elected officers are: H. M. Kerr, secretary; W. E. Wilson, treasurer; and R. J. Cole, assistant treasurer. Mr. Kerr will also act as controller.

Ground is being broken for a large addition to the Portage Company's plant, to take care of increasing business, and it is expected that the new addition will double the present capacity.

The B. & W. Rubber Co., Akron, has completed its main building, 60 by 240 feet, two stories in height. The machinery for the mechanical department is installed and in operation and that for the tire department is being installed. It is hoped that the tire department will be in operation by April 1, with a daily production of 150 tires. H. A. Backderf is president of the company.

CLEVELAND NOTES.

The Cleveland Osborn Manufacturing Co., Cleveland, Ohio, has changed its name to The Osborn Manufacturing Co., Inc.

The Tyler-Patterson Co., 404 Superior Building, Cleveland, Ohio, has been formed by Edgar J. Tyler, until recently vice-president and director of Ralph L. Fuller & Co., Inc., and C. B. Patterson, formerly in charge of the rubber materials division of the Fuller company. The new concern will act as manufacturers' agents, brokers and dealers in raw materials for the rubber industry and others.

The Uncle Sam Tire Co. has changed its name to The Hubbell Tire & Rubber Co., with offices at 6545 Carnegie avenue, Cleveland, Ohio. It manufactures tires and tire machinery and will install equipment for the manufacture of its own patented tire molds and vulcanizers. The authorized capital has been increased from $200,000 to $1,200,000.

MISCELLANEOUS OHIO NOTES.

The Mason Tire & Rubber Co., Kent, Ohio, at its annual stockholders' meeting, elected the following directors for the fiscal year 1920: O. M. Mason, John H. Diehl, R. M. MacKinnon, D. M. Mason, E. G. Tillotson and W. R. Green. These in turn, at the first directors' meeting, elected the following officers: O. M. Mason, president; John H. Diehl, first vice-president; R. W. MacKinnon, second vice-president; D. M. Mason, treasurer, and William A. Cluff, secretary. W. J. Rennick and H. W. Sidnell were also appointed assistant treasurer and assistant secretary, respectively.

The Marion Tire & Rubber Co., Marion, Ohio, was reorganized at the beginning of 1920, and its capital increased to $750,000. The new officers are nearly all Akron men. The president is A. F. Ayers; vice-president, W. E. Cameron; secretary, G. W. McLaughlin; treasurer, S. F. Zilliox. The other directors are R. C. Ellsworth and W. A. Patterson, of Akron; C. W. Mapes, J W. Jacoby and R. D. Belden, of Marion, and W. H. Holreistott, of New York. W. A. Patterson was made factory manager. The capacity of the Marion plant at present is 1,500 tubes and 400 tires per day, but it is planned to double this production as soon as possible.

The Ashland Tire & Rubber Co., Ashland, Ohio, expects to complete the first unit of its factory in February. It is 225 feet long and 100 wide, with 45,000 square feet of floor space, and is built of reinforced concrete. The main building, power house, and two smaller buildings will cost approximately $150,000. The machinery has been ordered and a two months' supply of crude rubber purchased. The company will manufacture cord and fabric tires.

Export arrangements have been made with A. Metzner, of Cleveland, whereby George W. Bond will represent the Ashland company on his present trip abroad. He will visit England, Czecho-Slovakia, Germany and Austria, and other Central European nations.

The Ashland Tire & Rubber Co. was incorporated in June, 1919, with $500,000 capital stock, of which it has sold more than $350,000 to date. The officers of the company are: J. Fickel, president; G. C. Weyher, vice-president, and A. A. Fickel, secretary and treasurer. The president and H. C. Bate, one of the directors, left in January on a three weeks' business trip to Cuba to make a careful study of that market for automobile and truck tires.

The India Tire & Rubber Co., Mogadore, Ohio, has just completed the new building south of its initial structure, besides improving the older building. At the annual meeting on January 19, stockholders were asked to ratify an increase in the capital stock from $1,500,000 to $5,000,000, this increase having been acted on favorably by the board of directors to take care of increasing business.

Plans for increasing the capital of the Interlocking Cord Tire & Belt Co., of Mogadore, was decided upon at a stockholders' meeting, held recently, but no definite announcement has been made as to the amount. The company is made up of 125 Akron business men. For the past year it has manufactured 30 by 3 tires, but arrangements are now being made to include other sizes. The purpose of the new capital is said to be to bring the capacity of the factory to 1,000 tires per day.

The McGraw Tire & Rubber Co. at the annual meeting of stockholders held at East Palestine, Ohio, on January 12, 1920, elected officers for the ensuing year: E. C. McGraw, president; John Morgan and R. W. McGraw, vice-presidents; John Morgan, treasurer; L. M. Kyes, secretary; H. C. Johnston, assistant secretary. Directors: E. C. McGraw, John Morgan, R. W. McGraw, L. M. Kyes, George Flaccus, J. C. Chamberlin, S. L. McCune, William Leary, A. W. Henn and H. M. Bacon.

During 1919 the business each month showed substantial increases over the previous year's record. In 1920 new branches will be added to the fourteen already established. The officers deny emphatically the rumors of the sale or merger of the company.

F. E. Kaeppel, recently associated with the Mechanical Rubber Co., Chicago, Illinois, and formerly with the Federal Rubber Co., Cudahy, Wisconsin, has been appointed general sales manager of the newly organized Ohio State Rubber Tire Co., Port Clinton, Ohio, which builds tires and tubes for the jobbing trade exclusively. Mr. Kaeppel will have sole charge of the company's sales throughout the United States.

TRAILERS TO CUT THE COST OF MOTOR HAULAGE.

More than half a billion dollars a year is being spent unnecessarily in the United States for road haulage by motor truck. Some 600,000 trucks throughout the country are rendering an annual service of about 7,950,000,000 ton miles at a cost not far from $1,828,500,000. This is based on an average operating cost of 23 cents per ton-mile.

Tables of operating costs of trailers and semi-trailers show the cost to vary from about three and one-half cents to six and one-half cents per ton-mile, according to type and size of trailer. This indicates five cents as an average, but to be conservative, an average of ten cents per ton-mile is taken as the basic cost of haulage with trailers and semi-trailers.

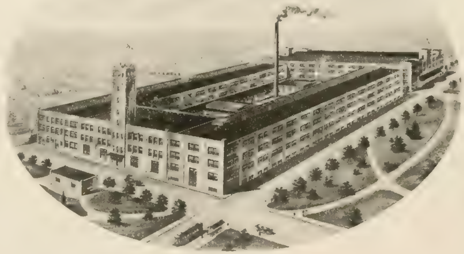
If every motor truck were to draw one trailer or semi-trailer of the same load capacity as the truck, half the total tonnage would be carried on the trailers at a saving of 13 cents per ton-mile or a total of $516,750,000 annually in the nation's motor haulage bill. This is the solution if the cost of motor haulage at distances greater than fifty miles is to be reduced materially and put on a competitive basis.

Incidentally 600,000 trailers would call for 1,200,000 to 2,400,000 tires for original equipment and from 300,000 to 600,000 spare tires besides.

THE PERFECTION TIRE & RUBBER CO.

One of the pleasantest experiences of a recent Western trip was a visit of a representative of The India Rubber World to the plant of The Perfection Tire & Rubber Co., at Fort Madison Iowa, one of the most progressive rubber manufacturing concerns in the Middle West. This plant, comprising 380 acres of land, is most favorably located on the main lines of the C. B. & Q. and Santa Fe railroads and is an attractive example of rubber mill architecture. The factory buildings are of fire-proof construction, with dimensions of 350 by 180 feet, affording a floor space of 260,000 square feet. They are equipped with automatic sprinklers and fire doors throughout and the arrangement of the various departments constitute a most ingenious plan to economize effort and avert lost motion. Separate from these buildings are a well equipped tool house and one devoted to spreader work.

A large number of substantial and attractive dwellings, costing from $5,500 to $8,000, have been erected for the factory executives and are now being occupied by them. An imposing brick structure, now being built, on the main street, in front of the factory, will serve as a club for the entertainment of visitors. Each room will have a bath attached and dining and entertainment facilities will be provided for the guests of the company.


Plant of The Perfection Tire & Rubber Co., Fort Madison, Iowa.

The mill and calender rooms, building and vulcanizing departments are equipped with the most modern types of machinery and devices known to rubber manufacturing usage. The laboratory in charge of a competent chemist, is fitted with the latest and most approved appliances. The power plant is in consonance with the general character of the mill, and leaves little to be desired in point of complete and up-to-date equipment. The power itself is derived from the Keokuk Dam said to be the largest in the country and yielding power at $0.007 per kilowatt. The present output of 700 tires and 500 tubes a day will be increased to meet the growing demand for these products. The company has on hand sufficient material, including chemicals, crude rubber, and fabric to meet its requirements until next September.

The products of The Perfection Tire & Rubber Co., include an asbestos protected tire of unique, patented structure, for which is claimed unusual durability and inexpensive mileage. Another, is a cord tire built on the Dickinson cord tire machine controlled by the company, and is expected to prove an important factor in tire production. The third is a ribbed or plain tread fabric tire which has elicited favorable comment and a good demand. Perfection gray and red inner tubes and inner linings are of construction and quality commensurate with general "Perfection" standards. The favorable labor conditions in this section are reflected in the fact that the 600 employes of the company are 100 per cent American.

The president and general manager of the company, Preston E. Roberts, who is admittedly responsible for the development and present status of The Perfection Tire & Rubber Co., is a man of unusual capacity, versatile and resourceful in a marked, unusual degree. The other officers are R. J. Evans, vice-president and F. J. Keating, secretary and treasurer. The board of directors comprise Rufus F. Robinson, Chicago, Illinois; Preston E. Roberts, Fort Madison, Iowa; F. J. Keating, Peoria, Illinois; J. F. Figley, Canton, Ohio; Edwin Telman, Peoria, Illinois. R. J. Evans, Wabash, Indiana; H. M. Scambler, Chicago, Illinois.

The general superintendent, William T. Whitlock, was formerly with the G. & J. Tire & Rubber Co. and The Fisk Rubber Co., and is an expert in modern tire production. He is ably assisted by Curtis L. Moody.

The Wabash, Indiana, division of The Perfection Tire & Rubber Co., is devoted to the manufacture of mechanical goods and asbestos fabrics. It comprises 100,000 square feet of floor space and it is stated that the output of this division is contracted on a cash in advance basis. The products are filter cloth, plain cloth, wire inserted cloth, yarns, mantle yarn, tape and listing, braided tubing, braided cord, twisted cord rope packing, wick packing, mill board, carded fibre and a general line of mechanical and molded specialties including plumbers' supplies, braided flax packing and shoe soles and heels.

An arrangement covering a period of twenty years has been made by The Perfection Tire and Rubber Co., with the Nemours Trading Corp., who have undertaken the entire distribution of "Perfection" products.

MID-WESTERN NOTES.

By a Special Correspondent.

At the annual meeting of the directors of the Mid-West Rubber Manufacturers' Association, held in Chicago January 15, the following officers were elected for the ensuing year:

John T. Christie, president; Hawkeye Tire & Rubber Co., Des Moines, Iowa; C. Wright, vice-president; Racine Auto Tire Co., Racine, Wisconsin; W. W. Wuchter, secretary; Nebraska Tire & Rubber Co., Omaha, Nebraska; George B. Dryden, treasurer, Dryden Rubber Co., Chicago, Illinois.

At the annual meeting of the Nebraska Tire & Rubber Co., held at Omaha, Nebraska, January 5, a resolution was unanimously adopted changing the capital stock of the company to $200,000 preferred stock and $300,000 common stock, and authorizing the officers to offer for sale $100,000 of the new common stock. The following were reelected to the board of directors for the coming year: James E. Cornish, V. E. Holm, S. C. Wolfe, George W. Masson, G. C. Peironnet, Alva Smith and W. W. Wuchter. The board of directors later reelected the following officers for the year: Alva Smith, president; G. C. Peironnet, vice-president; F. M. Holloway, secretary; W. W. Wuchter, general manager and treasurer.

With the commencement of the new year and its new addition complete and machinery installed, the Wilson Tire & Rubber Co., Springfield, Illinois, has changed the policy of the company from making the "Wearwell" tires to making a fabric tire of Egyptian fabric guaranteed for 6,000 miles. It has also part of its new cord equipment in and is building cord tires which will be guaranteed for 8,000 miles. The factory output will be approximately 800 tires per day by the end of February.

The Brunswick-Balke-Collender Co., Chicago, Illinois, manufactures billiard tables, phonographs, phonograph records, automobile tires and hard rubber goods, and the output is largely oversold in all departments. Five new factories for the manu-

facture of the Brunswick phonographs and phonograph records were purchased in different cities during 1919, and ground will be broken in the early spring for a large addition to the tire manufacturing plant at Muskegon, giving a capacity of 5,000 tires per day. Sales for 1919 were $25,000,000 as against $12,-416,000 in 1918. Estimates based on sales during January, 1920, put the total sales for the current year at $45,000,000 exclusive of the sales of the two lumber mills which the company owns in upper Michigan.

The Standard Four Tire Co., Keokuk, Iowa, held its annual sales convention, January 6-10, 1920, at Keokuk. All salesmen and branch managers were in attendance, talks by prominent men were given and a dinner and dance was held January 7. The close cooperation between the management and the employes is one of the features of this company and as one salesman remarked, "The whole company is like one large family, less the usual family disputes."

Robert J. Garrene, general manager of the New Ten Broeck Tyre Co., recently entertained about five hundred employes and their families at the plant with a vaudeville and cabaret "par excellence." Walther Grote, factory superintendent and assistant general manager, mystified the audience with a sleight of hand performance. Allan Heine, advertising manager, next on the program with a violin solo, was followed by a professional interpretation of how they dance in Hawaii. After refreshments were served, a jazz orchestra furnished music for a dance, which was thoroughly enjoyed by everyone.

Inaugurating a new policy of establishing distributing centers for its products in various sections of the country, the Republic Rubber Co., Youngstown, Ohio, has opened a western distributing warehouse at First and St. George streets, St. Louis, Missouri, under the management of Edgar Evans. The St. Louis branch, which has just removed from 2020 Locust street to 1021-1029 Arcade Building, will continue to be operated independently under the management of L. N. Bartlett, who will conduct a truck tire service department in the basement of the distributing center building.

Glenn H. Morris, formerly of Los Angeles, California, has been appointed advertising manager of Thomas E. Wilson & Co., Chicago, Illinois, dealers in sporting goods.

Claude Platt, who has been with The Fisk Rubber Co., Chicopee Falls, Massachusetts, for fourteen years, of late having served as special factory representative, has resigned to enter the retail automobile trade in Chicago, Illinois, his home city.

The Kerr Co., Fort Worth, Texas, has changed its address from 1501½ to 207½ Main street. It expects to begin actual construction of its plant in February and production about May 1. The officers are: A. H. Kerr, president and treasurer; J. A. Dacus, vice-president and general manager; J. A. Smith, secretary; F. X. Schuler, consulting engineer.

The Portage Rubber Co., Akron and Barberton, Ohio, has established a distributing warehouse in Chicago, Illinois, in addition to several new factory branches in various parts of the country.

PACIFIC COAST NOTES.

By Our Regular Correspondent.

LOS ANGELES NOTES.

The executive offices of the Samson Tire & Rubber Corp. have been removed from the factory at Compton to large and commodious quarters at 333 West Pico street, Los Angeles, where the service station has been located for several months. The company, of which Adolf Schleicker is president, manufactures cord tires.

William J. Kelly, dean of the rubber importers of the United States, of the firm of Poel & Kelley, New York City, spent a fortnight in Los Angeles on his way to Honolulu with his daughter, Miss Jeannette Kelly. He also visited San Diego and San Francisco. During his Los Angeles sojourn he was a guest at the winter residence of Henry C. Pearson, publisher of The India Rubber World, and passed several hours on the golf links of the Brentwood Country Club.

Steps to organize a Pacific Coast Cotton Exchange were taken recently in Los Angeles when men identified with every phase of this growing industry in California and Arizona met at the Los Angeles Athletic Club. Leading cotton growers, shippers, manufacturers and representatives of local banks were present.

The Mohawk Rubber Co., of Akron, Ohio, has leased the ground floor of the Flower Auditorium Building, Los Angeles, where a factory branch in charge of Carl Laux will be established.

B. F. Wade, operating as the B. F. Wade Tire Co., of 512 East Eighth street, Los Angeles, has filed in the United States Court an involuntary petition in bankruptcy. The creditors asking that Wade be adjudged a bankrupt are the Canton-Blackstone Co., with a claim of $17,516.93, the Tyer Rubber Co., of Andover, Massachusetts, $13,675.43, and the Dayton Rubber Manufacturing Co., $2,000. W. H. Moore, Jr., was appointed receiver for the concern under a bond of $4,000.

Edward M. Snuffin, district manager of the Ajax Rubber Co. in Los Angeles, has returned from a two weeks' tour of Arizona during which he completed arrangements for the establishment of a factory branch in Phoenix.

What constitutes somewhat of an innovation in tire distribution methods has been inaugurated in southern California by the Rubber Products Co., of Barberton, Ohio, manufacturers of "Stronghold" and "Barberton" tires. As the result of recent negotiations the Ralphs Grocery Co., Los Angeles, becomes the distributer of these brands of tires and they will be placed before the consumer through the chain of seven Ralphs retail stores in Los Angeles and by other dealers in the surrounding towns.

J. B. Wood, distributor of Hewitt tires and tubes in Los Angeles, is planning to bring the factory basket-ball team from Buffalo to Los Angeles and is trying to arrange a series of games for the event with some of the best teams on the Coast.

H. G. Smith, manager of the Los Angeles branch of the Ajax Rubber Co., Inc., for the past four years, has resigned to accept a position in a different capacity. He was one of the best known figures on automobile row.

The Los Angeles branch of the Firestone Tire & Rubber Co., with a newly organized bowling team, has entered the first national telegraphic tournament organized by that company, scheduled for February 1. It is open to all branches of the company and will be rolled simultaneously on that night, the names of the individual players and their scores being telegraphed to Akron in code. A. G. Partridge, vice-president in charge of sales, has donated a beautiful trophy cup as a prize to become the permanent property of the team winning the title two years. E. M. Barlow, of the sales department, is manager of the Los Angeles team. The line-up is as follows: E. A. Douglas, captain; R. A. Guthridge, R. Y. Copelin, G. O. Fries, H. Johnston, R. W. Irwin and H. V. Wilson.

J. B. Linerd, president of the Globe Rubber Tire Manufacturing Co., of Trenton, New Jersey, was a recent visitor in Los Angeles. He is said to be the youngest head of a tire concern in the United States. During his visit he was in conference with A. T. Smith, Pacific Coast representative of the Globe company and W. Reeve Gartzmann, manager of Hawley, King & Co., Southern California distributors.

Construction work is going forward rapidly on the new building being erected for the Miller Rubber Co. of California at 1239 South Olive Street, Los Angeles. The building, owned by Jonathan R. Scott, will cost $26,000. It is a two-story brick structure especially designed for the local branch of the company.

Harold Austin Freeman, a graduate of the University of Southern California, class of 1916, is to be in charge of the chemical laboratory of the Goodyear plant at Los Angeles.

New Year's greetings from Frank R. Carroll, head of The B. F. Goodrich Co. interests in the Orient have been received in Los Angeles. He was formerly in charge of the Los Angeles branch, but was assigned to Japan, where American tires are making tremendous gains.

W. S. Thatcher, of the Los Angeles branch of the Brunswick-Balke-Collender Co. tire department, has received word of the expansion plans of the concern, by which the capacity of the plant has been doubled. Samuel J. Turnes, general sales manager in California, accompanied by E. Tatman, assistant sales manager, recently paid a visit to Los Angeles.

Louis Lichtenberger, president of the Lichtenberger-Ferguson Co., factory distributor of Norwalk tires in Los Angeles, says that January is a heavy buying month in the tire trade while December is the slowest month of the year. The low ebb is due to weather conditions and to the fact that dealers do not want to carry a big stock through their annual inventory period which usually takes place the first of each year. According to Mr. Lichtenberger, the following is a table of percentage for the year's distribution of tires throughout the country based on three years' records:

Month.	Per Cent	Month.	Per Cent.
January	10 1/10	July	10 4/10
February	8 4/10	August	9 5/10
March	10 3/10	September	7 1/10
April	8 3/10	October	6 4/10
May	9 8/10	November	4 9/10
June	10 1/10	December	4 7/10

Marshall E. Morris, manager of salesmen for The Goodyear Tire & Rubber Co., has been appointed a member of the board of directors of The Goodyear Tire & Rubber Co., of California. Mr. Morris first came to the Goodyear company as manager of the carriage tire department in 1912. Since that time his rise has been remarkable even for the rubber industry.

Frank Westerhoff, who formerly represented the Standard Four Tire Co., Keokuk, Iowa, in Illinois, has been appointed manager for the company at its branch at 348 West Pico street, Los Angeles.

A movement has been started to make Los Angeles, California, the terminus of the Lincoln Highway. The proposal is to establish a branch of the great trancontinental highway from Ely, Nevada, to the California city, a distance of 770 miles. Ely is the first town reached after crossing the desert section of the Great Salt Lake country.

NORTHWESTERN NOTES.

Leavens & Howard, of Portland, Oregon, Pacific Northwest distributers for the Sewall cushion wheel for trucks, have opened a branch in Seattle.

The Western Rubber Co. has begun to manufacture tires in its new plant in South Tacoma, Washington. Machinery was installed early in the year, there being some little delay in getting shipments. The plant is so located that raw rubber can be handled from ship side to the factory direct. The plant started with a working force of 125 men. Elmer Dover, former secretary of the Republican National Committee, and later Pacific Coast manager for Byllesby & Co., operators of public service plants, is president of the concern.

The Washington Tire & Rubber Co., Spokane, Washington, started operations in a small way in May, 1919, and entered its first full year's production January 1, 1920. The production will reach 200 casings and 200 tubes a day during February, to be increased from month to month. At the present time 120 workers are employed, 94 per cent of whom are stockholders in the company.

Although its estimated production for 1920 was placed at 60,000 casings and 40,000 tubes, it is believed that the demand for its product, which is being marketed under the trade name "Western States," will increase to 100,000 casings and 100,000 tubes this year. At present fabric tires only are made, but later cord tires will be manufactured.

The officers of the company are all representative and well known Spokane business men. The president is A. G. Hanauer, vice-president, T. S. Lane, and secretary-treasurer, H. S. Burdick.

CANADIAN NOTES.

The new price list on rubber footwear was issued in Canada on December 26, 1919, instead of two months later as is usual. The prices are considerably higher than the old list, being approximately from 10 to 15 per cent more on light lines and from 15 to 20 and 25 per cent on other goods. Advances in the cost of raw stocks and labor are given as the reasons for the issuing of the new price list at the earlier date.

The Canadian Board of Commerce, on November 26, 1919, issued an order that the margin of gross profit on sales of boots, shoes, rubbers, overshoes, etc., in retail shoe stores shall not exceed 33⅓ per cent of the sale price.

Gutta Percha & Rubber, Limited, held a meeting of branch managers in Toronto recently, at the King Edward Hotel. The Ontario division extends to Brockville in the East, to Sarnia in the West, and to North Bay in the North.

The Canadian Shoe Manufacturers' Association held its annual convention in Quebec City, at Chateau Frontenac, January 20-21.

The Ames Holden McCready System, Rubber Section, has appointed H. A. Braendle, M. A., physicist in charge of its Montreal laboratories and H. F. Schippel, B. Sc., research engineer. Mr. Braendle is a g raduate of the University of Toronto where he conducted research work on colloids under Professor E. F. Burton, while Mr. Schippel was formerly on the staff of McGill University. Both men were also more recently with the general laboratories of the Canadian Consolidated Rubber Co., Limited.

W. B. Wiegand, formerly general technical superintendent of the Canadian Consolidated Rubber Co., Limited, has been appointed director of manufacturing for the Rubber Section of the Ames Holden McCready System, Montreal, Quebec.

The British & Foreign Agencies, Limited, 17 St. John street, Montreal, Quebec, has secured the exclusive Canadian agency for "Lastawl" fibrous rubber soling manufactured by The "Lastawl" Co., 132 Boundary street, Liverpool, England..

The Canadian Customs Department has ruled on the duties to be levied on a number of articles containing rubber, making them invariably higher than the British preferential rates. The rates are: Belting, not of leather, 27½ per cent ad valorem; belts, other than transmission belts, 17½ per cent; finished parts of garters and hose supporters, 20 per cent; brake lining, 30 per cent. The last article is subject in addition to a war tax of 7½ per cent ad valorem.

Quebec in 1918 exported 159,175 tons of asbestos and asbestic, valued at $9,053,945, as compared with 154,452 tons, valued at $7,240,697 in 1917. The stock on hand December 31, 1918, was 14,609 tons of the value of $2,085,395. The average value per ton of asbestos in 1918 was $63.35, as against $52.45 in 1917. Of the 1918 exports 6,518,687, more than two-thirds, went to the United States.

The Rubber Trade in Great Britain.

By Our Regular Correspondent.

Manufacturers in the United Kingdom are hoping that 1920 will open with the resuscitation of The India Rubber World, or rather a cessation of its suspended animation. We have our own labor worries here of one sort or another, but so far our trade journals have come out regularly.

Although the country is supposed to be on the verge of bankruptcy there seems to be plenty of money for investment, as well as for personal requirements. I hear that the Greengate Rubber Co.'s issue of new capital was quickly subscribed for, and there have been other concerns, including the St. Albans Rubber Works, which make the Grimston tire, that have done well in this respect. The Eastern produce firm of Harrisons & Crosfield, Limited, who are largely concerned with plantation rubber, have raised their capital to £2,525,000 and made an issue of 400,000 shares of 10 per cent cumulative preferred ordinary stock at £1 each, to be used for the general purposes of the business.

INTEREST IN COTTON MILLS CONTINUES.

The speculative boom in cotton mills shows no abatement and the Chancellor of the Exchequer is considering where he is to come in on the profits which are being made. With regard to the price of cotton goods, which will certainly not be easier in the near future, Mr. Ormrod, when presiding at the annual meeting of the Dunlop Rubber Co., mentioned that the price of cotton duck is now 400 to 500 per cent over pre-war prices. No doubt the new invasion of America by the Dunlop tire will receive due notice in The India Rubber World, and I shall not comment on it here.

RUBBER AND POLITICS.

The "Anti-Dumping Bill," to give it its popular name, will probably not be heard of again, as its provisions are distasteful to Protectionists and Free Traders alike. Quite probably it will be replaced by a simpler measure dealing with the so-called "key industries" alone. This will mean that such few rubber goods as we import into this country will be able to come in without irksome formalities. Mr. Justice Sankey's ruling that the banning of imported goods by the Board of Trade is illegal has naturally made a big stir and much interest is centered upon the government's appeal to the House of Lords. Pending this appeal, banned goods, interesting to rubber manufacturers, notably zinc oxide and lithopone, will be allowed in, but importers are warned that if the government's appeal succeeds, the importers will have to face the consequences of their action.

I have not heard from any unbiased source whether the zinc oxide now being made in England is quite equal to that which used to come from the Vicille Montague Co. on the Continent, or whether it is only on a par with what used to be obtained from America, this latter never having been considered equal to the continental, though it had an advantage in price. Now that the use of lithopone as a substitute for zinc oxide has become so firmly established, the latter is not likely to be in the same general demand as in pre-war days. An important point with regard to the present unrestricted import of zinc oxide and lithopone is that the government is not in a position to restrict importation from countries affected by a collapse in exchange, unless or until enabling legislation for the purpose is enacted by Parliament.

ADVISORY COMMITTEE FOR AERONAUTICS.

A preliminary report on the variation of the hydrogen permeability of rubber membranes with alteration in temperature was made to the above government committee during the war by D. B. Porritt and W. S. Allen, the work having been carried out by them in the research department of the North British Rubber Co. It was expected that the results of the investigation would prove of benefit both in the design of laboratory testing apparatus and as indicating the results which might be expected from an envelope under the ordinary condition of usage. A few previous experiments carried out at that National Physical Laboratory showed that the variation due to temperature amounts to about 7 per cent per degree centigrade. The plotted curve of the North British results show a consistent increase in permeability as the temperature rises. Thus the loss of hydrogen in liters per square meter per 24 hours was as follows:

Period of Time.	Temperature, Degrees.	Loss of Hydrogen in Liters.
24 hours	1.0 C.	2.26
24 hours	7.5 C.	3.31
24 hours	15.0 C.	4.56
24 hours	25.0 C	8.19

These results, the authors say, clearly illustrate the necessity for the careful regulation of temperature when testing balloon fabrics for gas tightness. They further show the increased loss of gas which must be experienced by airships in the summer months and point to the desirability of adopting every available precaution to keep the interior of sheds at a low temperature, whether by ventilation, refrigeration or by protecting the roof by some heat reflecting composition. The gas loss from the upper surface of a balloon fabric in sunshine, they say, must be very serious since the surface of the fabric will absorb a considerable amount of heat. Variations in atmospheric pressures are unimportant.

THE MACKINTOSH TRADE.

There is considerable demand for waterproofs, and many developments are noticeable compared with the trade of five years ago. Greater warmth is a feature which came in with the war. Thus we have the mackintosh with a detachable fleece lining, being adaptable for either summer or winter use. With regard to the high-class mackintoshes, lined throughout with white fur, put on the market by an important firm of London outfitters at a price in the neighborhood of 14 guineas, I doubt if the sales will continue to any extent now that trench warfare is a thing of the past.

These coats are uncomfortably hot to walk about in, though for standing about, or for driving in, when the weather is wet, as well as cold, they form an important addition to one's ordinary outfit. These coats do not seem to be very well known, as a proofer and maker-up of garments told me he had never seen or heard of one. An ordinary fur coat has, of course, a long life (moths permitting), but the ordinary vulcanized mackintosh has not, and it seems to me that the combination of the two, even though the fur is not the chinchilla variety at a guinea an ounce, must always remain an article of luxury for the wealthy. Another new feature is the triple-proof raincoat, i. e., a rain-proof coat interlined with rubber, the main object being greater warmth, this being the desideratum of both sexes.

TRADE NOTES.

The boot polish department of Wood-Milne, Limited, has been disposed of to Hargraves Bros. & Co., Limited, Hull. Now that the Wood-Milne company has become such a large concern in the tire world, it is not altogether surprising that business of less importance and of more competitive character should be disposed of to specialists.

It is announced that electric cables are to be made at Woolwich Arsenal. Various schemes have been mooted for the use

of spare government buildings for this or that trade purpose, and manufacturers interested have generally opposed them. It will be interesting to see if anything of the sort occurs in this case.

The report of the India Rubber, Gutta Percha and Telegraph Works Co., Limited, of Silvertown, shows a profit of £71,913, a reduction on last year. This is stated to be due to the various difficulties arising out of the reconstruction period, leading to a diminution in output.

At the annual meeting of W. & A. Bates, Limited, Leicester, when there was declared a profit of £42,972 and a dividend of 10 per cent for the year, the chairman, P. H. Lockhart, spoke at length on the importance of motor transport in the present congested state of the railways, saying that arrangements are being made to cover every town and village in the county by a motor system. Mr. Lockhart is now with Alex Johnstone and J. Tinto, a vice-president of the Federation of British Industries.

During a violent gale, which occurred on the day predicted for the end of the world, considerable damage was done to the Globe Rubber Works, Manchester, a huge shed about 200 feet long being lifted bodily from its supports and carried 20 or 30 feet by the wind until it crashed into the firm's offices.

William Symington & Co., Limited, 22 Fenchurch street, London, E. C. 3, has changed its name to "General Rubber Co., Ltd.," in order to have a uniform style for all branches in the various rubber-producing and consuming markets of the world.

Hale & Son, 10 Fenchurch avenue, London, E. C. 3, dealers in crude rubber, have taken William B. J. Horne into partnership. Mr. Horne has been associated with the firm for the last fourteen years.

While $25,000,000 worth of first-class American automobile tires were allowed to rot at Verneuil, France, according to the "American Economist," the British Government made arrangements by which the Hercules Tyre Co. will take over the sale of all the pneumatic tires and tubes discarded by the British army in France. Some of these have been sent to the French works, the others are returning by shiploads to England from Marseilles, Calais, Boulogne and St. Malo.

Liverpool imported from the United States in 1918 gutta percha of the value of $703,676, and manufactured rubber goods valued at $910,399, motor cars and rubber tires and tubes valued at $517,279, rubber shoes valued at $254,774, and waterproof garments worth $67,785.

BRITISH KEY INDUSTRIES TO BE PROTECTED.

The important restrictions intended to shield British industry during the period of demobilization and of change from war to peace conditions came to an end September 1, and the future trade policy of the United Kingdom as announced by the Prime Minister embraces three proposals of interest to the rubber industry of the world. They are that Parliament deal effectively with dumping; that it equip the Board of Trade with emergency powers to check a sudden and undue importation of goods at prices altogether below the cost of production in the United Kingdom, owing to the collapse of exchanges; also that the Board of Trade be empowered to prohibit the import, except under license, of goods which are in competition with key industries.

Their object is to defend the United Kingdom against unfair competition that might destroy certain unstable key industries that could not be maintained in the face of extensive dumping of foreign goods beneath the price at which they are sold in the country where produced, and of German goods at exchange rates so extravagantly in favor of Great Britain that the goods would sell at prices not only lower than those current in Germany, but lower than the cost of production in Great Britain. By unstable key industries is meant those essential for war or the maintenance of the country during war; those of inadequate producing capacity to meet the nation's war needs; those requiring Government aid in war time, and those unable without such aid to maintain themselves at the level of production shown by war to be essential to the national life.

That the British rubber goods manufacturing industry is essential for war is obvious, and that the United Kingdom desires to maintain its independence in the manufacture as well as the production of rubber is certain. The high American exchange rate is unfavorable to England, yet while the determination to abandon further support of exchanges may cause a further rise in American exchange, and will doubtless increase the cost of many raw materials obtained from America, it will also raise a higher barrier against the import of American manufactured goods which are considered essential to stimulate greater home production.

Thus far rubber products have not been specifically mentioned among the key industries to be protected, although certain raw materials used in the manufacture of rubber goods have been listed. Pending legislation, a general license under Prohibition of Import Proclamations will be issued by the Board of Trade, having effect as from September 1, 1919, and authorizing the importation into the United Kingdom of all goods not specified in a list consisting of synthetic drugs, organic chemicals and numerous miscellaneous commodities, the only items of prime interest to the rubber industry being zinc oxide and lithopone.

The preferential tariff dating from September 1 last, which explicitly favors goods coming from British colonies and possessions, takes the place of the war restrictions which expired in August. Under these restrictions foreign tires could not be imported free. The new tariff arranges that motor cars and parts thereof "from the colonies shall pay only two-thirds of the full rate." The British Rubber Tyre Manufacturers' Association, as its chairman declared at the annual meeting, made a big fight to prevent the restrictions from being removed on tires, then tried to have tires defined as "parts thereof" in the tariff, and now will endeavor to have tires included in the next budget as dutiable. He also declared that the British tire trade must be made as strong as the transatlantic competition, that no one concern could meet the coming demand and that all the manufacturers should work together. That Great Britain must right the balance as regards the consumption of rubber and that the bulk of British-produced rubber should be used in British factories. The Association is an amalgamation of British tire manufacturers, among them the Dunlop company, which has started an aggressive American campaign and is big enough to resemble a trust.

When tanks were first used in the war, the British War Office originally intended to equip them with balata belting. Experiments by Sir William Trilton at Lincoln in August, 1915, put an end to that project.

Rubber has been sold in London as far ahead as 1923 at *2s. 4½d.* a pound ex warehouse. For 1920 and 1921 the price has been *2s. 6¼d.*

A Swedish syndicate is being formed at Stockholm on the lines of the old East India Co. of Gothenburg, with a capital of 30,000,000 kroner[1], whose main object is to buy rubber and other plantations in the Dutch East Indies, to work them by modern methods and ship the products by steamer direct to Sweden.

[1]One krona equals $0.268 United States currency.

Rubber Planting Notes.

PLANT DISEASE ALARMS UNWARRANTED.

While admitting that the question of rubber diseases in the Far Eastern plantations is important and noting that everyone can see the marks of them on the trees and that the reason why many estates are reported to be immune is that they have not been examined scientifically, "The India-Rubber Journal" is inclined to be ironical about disease scares, ascribing much of their severity to the imagination of the local press in enumerating the successive scourges which have not interfered with the development of the plantations.

The first alarm was over *Fomes* and other fungi that attacked the roots; then came the black stripe canker which affected tapped trees; this was followed by *Ustulina*, and the latest is the brown bast disease, of which the cause is yet undiscovered. The pink disease alone so far, though ever present, has not aroused concern. So long as no leaf disease attacks *Hevea brasiliensis*, rubber producers need not fear.

RUBBER RESEARCH IN CEYLON.

Rubber research was interfered with by the calling away of investigators for war service. The Rubber Growers' Association did not favor the plan of having all research combined and directed from a central body in England. Plans are formed for training young men to inspect the rubber districts in the way the tea districts are now inspected. A book on "Rubber Research in Ceylon" is to be published soon; it is made up of the bulletins that have been issued by the Ceylon Research Commission.

The investigation of rubber diseases is kept up in Ceylon, Professor T. Petch at Peradeniya having received 232 specimens. He reports that brown bast has spread throughout all the rubber districts, though it is more common in the drier regions. The cause and nature of the disease has not yet been fully decided upon, and the measures taken to overcome it seem to have varying success in the different provinces.

INVESTIGATIONS OF HEVEA IN MALAYA.

Variation in the *Hevea brasiliensis* that grows in Malaya have been, studied closely by Stafford Whitby, who gives the results in the "Annals of Botany." His investigations concerned the amount of rubber yielded by individual trees of the same age and growing under the same conditions, and also the possible relation between the girth of the trunk and the yield of rubber. About 1,000 seven-year-old trees in their third year of tapping on a normal plantation of about 13 acres, were under observation. As the seed from which the eastern plantations were grown was not selected seed the results are of particular interest.

Great variations were found in the rubber content of the latex of different trees, but the strength of the latex was constant for each tree, as a rule. Some trees yielded only 23 grams of rubber to 100 cubic centimeters of latex, and others yielded 54 to 55 grams; the mean of 243 trees examined was 36.58 grams to 100 cubic centimeters. Moreover, the older the tree the larger the rubber content; Mr. Whitby sets the yearly increase at ½ gram.

The yield of individual trees was found to be comparatively constant, a tree that was a high yielder at one time continued to be a high yielder through the two years of observation. The results were drawn from the examination of 1,011 seven-year-old trees. A large number of trees yielded from nothing to two grams a day, a few yielded over 27 grams; the average was 7.12 grams. Less than a tenth of all the trees yielded 28 per cent of the total, while over an eighth gave only 2.9 per cent of the yield, and certainly did not pay for tapping. Four exceptional trees yielded 41.45, 41.56, 41.72 and 42.77 grams a day. The possibilities of improving rubber yield by a proper selection of seeds seems clear.

The investigation into the girths, while it showed that trees with large trunks were good yielders and those with small trunks poor yielders, did not determine the matter clearly enough to justify destroying trees. The investigation of A. A. L. Rutgers in Sumatra, printed in the "*Archief voor de Rubbercultuur Nederlandsch-Indië*," agree with Mr. Whitby's results.

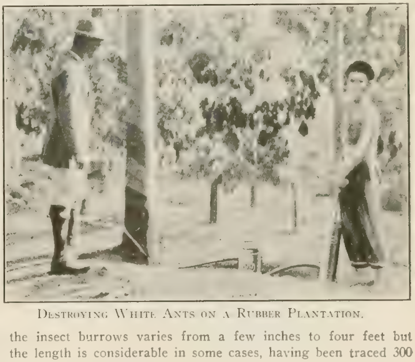
It is not possible under present plantation conditions, where high and low-yielding trees are intermixed, to determine whether seeds from a high-yielding tree will produce other trees that are also high-yielding. To decide that, the young trees should be segregated so that the pollen from the poor yielders cannot fall upon them.

SCIENTIFIC RUBBER PLANTING IN INDO-CHINA.

At Saigon, in French Indo-China, an official rubber laboratory has been established as a branch of the local Pasteur Institute, with Dr. Lahille in charge of it. Governor-General Maspéro took on himself the responsibility of adding the money needed to the budget. The Scientific Institute of Indo-China has also been brought into being, whose agricultural department will supervise *Hevea* culture as one of its functions. Both laboratory and institute will work, so far as rubber is concerned, in close connection with the newly instituted rubber department of the Marseilles Colonial Institute, which is in charge of Dr. Van Pelt.

WHITE ANT EXTERMINATOR.

The termites or "white ants," as they are usually called, are troublesome pests on rubber plantations where they enter the roots of the trees and often excavate the stem. The depth of the insect burrows varies from a few inches to four feet but the length is considerable in some cases, having been traced 300 feet from the nest.



Destroying White Ants on a Rubber Plantation.

Soil insecticides are said to be practically useless in exterminating these pests and fumigation is the only satisfactory method. A poisonous white ant powder is heated in a machine comprising a charcoal furnace, generating fumes that are forced into the burrows by means of an air pump. All openings being sealed with clay, the fumes will destroy the ants and eggs in a few days' time. (The Four Oaks Spraying Machine Co., Four Oaks, Sutton Coldfield, near Birmingham, England.)

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED DECEMBER 2, 1919.

No. 1,323,259. Puncture proof tire interliner. H. A. Falvey, Chicago, Ill.
[illegible] Demountable rim for tires. L. De Holczer, Sioux City, Iowa.
[illegible] Ear air douche. C. F. Gottfried, Brooklyn, N. Y.
1,323,487. Inking pad of sponge rubber. C. H. Payne, Cincinnati, Ohio.
1,323,610. Collapsible pneumatic mattress. G. B. Price, Topliff, Utah.
1,323,629. Rubber-tired rocker crutch. R. G. Hall, 616 Morgan Building, Portland, Me. This invention was described in The India Rubber World July 1, 1918, page 607.
[illegible] Surgical appliance. E. H. Galligan, Providence.
[illegible] Stream-line shield for cables, stay wires, and the like. R. H. Upson, assignor to The Goodyear Tire & Rubber Co.—both of Akron, Ohio.

ISSUED DECEMBER 9, 1919.

[illegible] Resilient tire. J. E. MacKay, Los Angeles, Calif.
[illegible] Vehicle tire with inflatable inner tube having a confining layer of inelastic material extending transversely around it, but extending across the tube at the valve to provide a reinforced valve seat. E. Sterns, St. Louis, Mo., assignor by mesne assignments to Surety Tire & Rubber Co., Wilmington, Del.
[illegible] Protective covering for pneumatic tires. C. Allen, Sydney, New South Wales, Australia.
[illegible] Auxiliary tire as pneumatic tire protector. C. Allen, Sydney, New South Wales, Australia.
1,324,400. Heel retainer. J. E. Ludlam, Bridgeport, Conn.
1,324,695. Tire tread. L. Schissel, Brooklyn, N. Y.
1,324,723. Fountain pen. B. B. Bradford, Fort Madison, Iowa.
1,324,730. Animal head with rubber lined mouth, for fur pieces, etc. T. Cohen and M. Lichtenstein—both of New York, N. Y.

ISSUED DECEMBER 16, 1919.

1,324,941. Air-cooled vehicle tire with rubber blocks in air chambers. T. C. Watkins, Ingram, Pa.
1,324,993. Rubber heel. W. C. Belknap, assignor to R. E. Miller, Inc.—both of New York, N. Y.
1,325,012. Low air pressure signal for tires. D. D. Getman, White Butte, S. D.
1,325,017. Wind shield wiper. L. C. Hill, assignor to Packard Motor Car Co.—both of Detroit, Mich.
1,325,019. Relief valve for pneumatic tires. C. A. Hussey, Battle Creek, Mich.
1,325,141. Reinforced pneumatic tire. H. G. Cave, New York, N. Y.
1,325,233. Pneumatic tire with three air chambers separated by rubber webs. J. D. Cooper, assignor of one-third to W. Parsons—both of Toronto, Ontario, Canada.
1,325,364. Reinforced tire. J. G. Lowe, Shelby, Ala.
1,325,367. Rubber heel. C. T. Maddock, Elyria, assignor of one-half to J. G. Schullian, Cleveland—both of Ohio.
1,325,389. Anti-skidding attachment for tires, with rubber blocks. J. B. Adduci, Boston, Mass.
1,325,391. Rubber hand stamp. E. S. Burroughs, Liverpool, England.
1,325,392. Fountain pen. G. T. Byers, Nyack, N. Y.
1,325,443. Fountain pen. F. W. Lee, Spokane, Wash.
1,325,448. Non-metallic wall for reservoirs having an inner coating of material insoluble in the lighter hydrocarbons and an outer self-sealing envelope composed of a layer of non-vulcanized rubber between two sheets of vulcanized fabric. A. Macbeth, assignor to Société The Dunlop Rubber Co., Limited—both of Paris, France.

REISSUES.

14,770 Demountable rim for tires. H. Bretscher, New York, N. Y., assignor of one-half to Felix Spitzner.

ISSUED DECEMBER 23, 1919.

1,325,607. Bather's wrist appliance to serve as pocket. E. H. Barber, Worcester, Mass.
1,325,695 Resilient heel. L. T. Fay, assignor to The Fay Rubber Products Co.—both of Elyria, Ohio.
1,325,714. Demountable rim. W. E. Copithorn, Natick, Mass.
1,325,717. Garter. R. Gorton, Brookline, Mass.
1,325,798. Patch fabric and method of manufacture. J. G. Moomy, Erie, Pa.
1,325,822. Rubber heel for shoes. G. F. Wells, Elyria, Ohio.
1,325,833. Rubber cushion wheel W. H. Damon, Los Angeles, Calif.
1,325,844. Fountain pen. H. S. Hasselquist, Chicago, Ill.
1,325,903. Device for cleaning windshields. C. B. O'Neill, Clymer, Pa.
1,325,918. Tire valve and alarm. F. H. Valiton, Deer Lodge, Mont.
1,326,090. Demountable rim for tires. L. H Perlman, New York, N. Y.
1,326,145. Windshield wiper. G. I. Stadeker, Chicago, Ill. For description see The India Rubber World, November 1, 1918, page 89.
1,326,154 Pneumatic tire. J. A. Johnson, Greenfield, assignor, by direct and mesne assignments, to J. W. P. Tire Company—both of Indianapolis, Ind.

ISSUED DECEMBER 30, 1919.

1,326,180. Tire lock. W. T. Campbell, St. Louis, Mo.
[illegible] Fountain pen cap. C. A. Luck, assignor to The Conklin Pen Manufacturing Co.—both of Toledo, Ohio.
1,326,250. Hose coupling. A. J. Brown, Union Hill, N. J., and A. A. Somerville, Flushing, N. Y., assignors to New York Belting & Packing Co., New York City.
1,326,418. Demountable rim. C. L. Peters and A. L. Johnson, assignors to Two Part Rim Company, Inc.—all of Worcester, Mass.
1,326,437. Motor vehicle wheel. C. V. Boys, Westminster, England.
1,326,444. Tire. J. Faske, Detroit, Mich.
1,326,445. Pneumatic or air valve for inflating various bodies. T. H. Fewlass, Detroit, Mich.
1,326,455. Dust cap for tire valves. P. W. Kautzman, West Hoboken, N. J., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.
1,326,542. Shoe-toe protector of vulcanized rubber and fabric. A. L. Stebor, Jr., Plainfield, N. J.

THE DOMINION OF CANADA.

ISSUED DECEMBER 2, 1919.

194,338. Wheel rim. L. L. Broyles, Vancouver, Washington, U. S. A.
194,347. Patch for tires. J. N. Davis, Denver, Colorado, U. S. A.
194,376. Tire having means for carrying air under super-atmospheric pressure. W. Huber, Ottawa, Ontario, Canada.
194,475. Disk wheel with pneumatic tire. The Interlocking Rim and Wheel Company, assignee of L. B. Harvey, both of San Francisco, Calif., U. S. A.
194,484. Rubber heel. R. E. Miller, Inc., assignee of Wilber C. Belknap—both of New York City, U. S. A. For description see The India Rubber World, December 1, 1919, page 157.

ISSUED DECEMBER 9, 1919.

194,517. Renewable tread for tires. J. H. Gill and J. D. Rea—both of Dunedin, New Zealand.
194,611. Wheel with demountable rim. C. F. Rubsam, New York City, U. S. A.
194,630. Demountable wheel rim. E. Oliver, Daytona, Florida, U. S. A.
194,642. Respirator. L. W. Paul and C. Hall—both of Pittsburgh, Pa.
194,651. Pneumatic tire. H Bretscher, New York City, U. S. A.
194,668. Demountable wheel rim. E. Eggimann, Madison, Wis., U. S. A.
194,683. Pneumatic suspension for vehicles. J. Hofmann, Aiken, South Carolina, U. S. A.
194,689. Pneumatic tire. E. A. Jones, Los Angeles, Calif., U. S. A.
194,691. Rubber tire. E. B. Killen, London, E. C. 4, England.
194,707. Demountable tire rim. J. H. Miskimen, Glendive, Montana, U. S. A.
194,714. Pneumatic tire. W. D. McNaull, Toledo, Ohio.
194,729. Rubber shoe sole of fabric and composition. J. Solomon, Oberlin, Ohio, U. S. A.
194,732. Hose coupling. A. E. Stove, London, England.
194,738. Dual pneumatic wheel rim. E. C. Walters, Akron, Ohio, U. S. A.
194,772. Hose coupling. The Independent Pneumatic Tool Co., Chicago, assignee of J. T. Nelson, Aurora—both in Illinois, U. S. A.
194,778. Piston packing. H. W. Johns-Manville Co., assignee of G. Christenson—both of New York City, U. S. A.
194,779. Piston packing. The H. W. Johns-Manville Co., assignee of G. Christenson—both of New York City, U. S. A.
194,780. Packing ring of rubber and fiber. The H. W. Johns-Manville Co., assignee of G. Christenson—both of New York City, U. S. A.
194,793. Detachable wheel rim. The Rapid Remountable Rim Co., assignee of O. P. Edstrom—both of San Francisco, Calif., U. S. A.
194,803. Hose coupling. The S. S. White Dental Mfg. Co., Philadelphia, Pa., assignee of W. R. Porter, Prince Bay, N. Y.—both in U. S. A.

ISSUED DECEMBER 16, 1919.

194,836. Rubber shoe sole. J. C. Jardine and J. Dickie—both of Summerside, Prince Edward Island, Canada.
194,846. Spring tire. W. Ashcroft, Garson Quarry, Manitoba, Canada.
194,848. Spring tire. H. C. Babel, Buffalo, N. Y., U. S. A.
194,876. Tire with sponge rubber core and air chamber. A. A. Crozier, London, England.
194,877. Tire with sponge rubber core and air chamber. A. A. Crozier, London, England.
194,878. Pneumatic tire of treated, rubber-coated rawhide. A. A. Crozier, London, England.
194,891. Automobile tire rim. E. P. Dill, Pittsburgh, Kansas, U. S. A.
194,920. Resilient tire. J. Jozak, Milwaukee, Wis., U. S. A.
194,938. Demountable rim for tires. H. P. Mulcahy, East Fremantle, Western Australia, Australia.
194,943. Demountable tire rim. W. W. McRea, Waikarim Canterbury, N. Z.
194,988. Pneumatic tire. W N. Stephens, Toronto, Ontario, Canada.
195,008. Tire tube. H. N. Wayne, Los Angeles, Calif., U. S. A.
195,045. Cushion tire. The Lambert Multiplus Co., assignee of H. M. Lambert—both of Portland, Oregon, U. S. A.
195,075. Pneumatic tire. Peter Malacos and M. Bratsis, assignee of a half interest, both of Wheeling, West Virginia, U. S. A.

ISSUED DECEMBER 23, 1919.

195,105. Demountable rim for tires. F. Spranger and N. M. Spranger—both of Detroit, Mich., U. S. A.
195,118. Listening apparatus with pneumatic cushions. A. Bloch, Paris, France.
195,121. Pneumatic tire. T Bradshaw, Oakland, Calif., U. S. A.
195,193. Demountable tire rim. E. A. Jones, Los Angeles, Calif., U. S. A.
195,194. Demountable tire rim. E. J. Jones, Los Angeles, Calif., U. S. A.
195,211. Surgical bust substitute. L. A. Meileue, British Columbia, Canada.
195,251. Stopper for rubber bath tubs, etc. M. C. Schweinert, West Hoboken, N. J., U. S. A.
195,296. Stethoscope. J. D. Pollard, Chicago, Ill., U. S. A.

ISSUED DECEMBER 30, 1919.

195,401. Pneumatic tire. J. F. Beeselman, East Chicago, Ill., U. S. A.
195,403. Spring tire. L. F. Biesmeyer, Onamois, Mo., U. S. A.
195,411. Collapsible rim for tires. J. A. Brereton, Toronto, Ontario, Canada.

Chemical Patents will be found on page 291. Machinery Patents on page 298.

195,430. Spring tire. A. A. Culbertson, Topeka, Kansas, U. S. A.

195,443. Tire casing. J. W. H. Dew, London, E. C., England.

195,477. Tire tube. A. E. Henderson, Toronto, Ontario, Canada.

195,462. Rubber-covered pedals for automobiles. (See The India Rubber World, October 1, 1918, page 33.)

195,506. Resilient vehicle tire. C. V. Merling, Centralia, Washington, U. S. A.

195,539. Cigarette and cigar cases. F. S. Russell, Glasgow, Scotland.

195,552. Pneumatic mattress. M. G. Stevenson, Orange Lake, Florida, U. S. A.

195,555. Gas Mask. M. Stogran, Cowan, Manitoba, Canada.

195,560. Demountable tire rim. B. T. Amburello, New York City, U. S. A.

195,628. Demountable tire rim. The Lightning Change Rim Corporation, Berrien Springs, Michigan, assignee of C. B. Deeds, Savanna, Ill., both in U. S. A.

195,629. Collapsible rim. The Lightning Change Rim Corp., Berrien Springs, Michigan, assignee of C. B. Deeds, Savanna, Ill., both in U. S. A.

THE UNITED KINGDOM.

ISSUED DECEMBER 3, 1919.

133,226. Reversible elastic heel pad with an interchangeable packing piece of rubber, etc. A. W. Oliver and F. Jennings, 35 New Cavendish street, London.

133,253. Filer pad to arch instep, attached by elastic bands. J. Chorlton, Staleywood, Mottram Old Road, and P. Hollingworth, 1 Knowl street—both in Staleybridge, Cheshire.

133,264. Tire valve. H. P. Kraft, 219 Godwin avenue, Ridgewood, N. J., U. S. A.

133,348. Kite balloon with ballonet. E. Prassone and L. Avorio, Savoy Hotel, London.

133,349. Captive kite balloon with gas container formed as a spheroid, ellipsoid, ovoid, etc., instead of a sphere. E. Prassone and L. Avorio, Savoy Hotel, London.

133,421. Dual tread spring wheel with continuous outer resilient suspension ring embedded in rubber and fitted with rubber treads. W. Heggie, 11 Georges Quay, Dublin.

ISSUED DECEMBER 10, 1919.

133,431. Renewable tread for pneumatic tire. I. H. Gill, J. D. Rea, and L. Sanderson, 40 Dowling street, Dunedin, New Zealand.

133,533. Fountain pen containing solid ink, etc. A. D. Moll, 35 Faunce street, Kensington, London.

133,547. Detachable rim for tires. A. E. Alexander, 306 High Holborn, London. (General Rim Co., 47 West 34th street, New York City, U. S. A.)

ISSUED DECEMBER 17, 1919.

133,832. Rubber and rubber-impregnated canvas sole for boots. J. E. Grosjean, 121 West Market street, Lima, Ohio, U. S. A.

133,855. Stand for drying painted golf balls. D. Conacher, 28 Royal Exchange Square, Glasgow.

133,863. Demountable rim for tires. B. F. C. Haanel, 236 First avenue, Ottawa, Ontario, Canada

133,871. Device for fastening boots or shoes with two side openings closed by elastic laces which permit removal without unfastening. L. Fullarton, 76 Dockhead street, Saltcoats, Ayrshire.

133,899. Tread band of fabric and rubber for pneumatic tires. T. Bradshaw, 263 Newton avenue, Oakland, Calif., U. S. A.

133,909. Hose coupling. W. Shackleton, 50 Cameron street, and J. J. Coggans, 50 Lauderdale Gardens, Hyndland—both in Glasgow.

133,932. A heel with core of wood, cork, etc., covered with vulcanite, rubber, or rubber and canvas compound molded thereon and vulcanized.

134,025. Wound dam of rubber. W. H. Taylor, 44 Summerhill Gardens, Toronto, Canada.

134,030. Suction denture with soft rubber annular suction disk. A. W. Fisher, Bryn Estyn, Whitchurch, Shropshire.

ISSUED DECEMBER 24, 1919.

134,080. Detachable heel for boots. C. P. Maher, 1836 Hutchison street, and E. J. Fetherstonhaugh, 286 St. James street—both in Montreal, Canada.

134,145. Rubber sole for boots. J. C. Jardine and J. Dickie, Summerside, Prince Edward Island, Canada.

134,165. Revoluble heel pad for boots. F. E. Freeman, 23 Lansdown Parade, Cheltenham, Gloucestershire.

134,317. Wheel tire composed of inflated rubber balls packed into an ordinary tire cover. J. M. Cooper, 63 Cumballa Hill, Bombay, India.

ISSUED DECEMBER 31, 1919.

134,407. Coupling for attaching inflating tube to a tire valve comprising a rubber bush to fit over valve stem. Wood-Milne, Limited, and W. E. Miller, Albion street, Gaythorn, Manchester.

134,420. Securing device for rubber heels, shoe buttons, etc. A. Nixon, 34 Deramore street, Great Western street, Rusholme, Manchester.

134,421. Rubber sole provided with reinforcing material which affords a hold for nails, to permit attachment. F. A. Nolan, 216 New York Life Building, St. Paul, Minn., U. S. A.

134,424. Driving belt of open mesh fabric filled with rubber. A. Cairns and T. W. Cairns, 22 Bessborough Road, Oxton, Birkenhead.

134,432. Respirators. Conde de Ramirez de Arellano, Batchelor's Farm, near Horsham, Sussex.

134,437. Stuffing-box substitutes of rubber, etc. A. E. I. Scanes, Strathfield, Harboro' Road, Ashton-on-Mersey, T. Brighouse, 5 Grosvenor street, Stretford, Manchester, and British Westinghouse Electric & Manufacturing Co., 2 Norfolk street, Strand, Westminster.

134,488. Tire valve. C. Marsh, 41 Francis Terrace, Lovely Lane, Warrington, Lancashire.

GERMANY.

PATENTS ISSUED, WITH DATES OF APPLICATION.

317,641. (April 16, 1916.) Artificial arm. Allgemeine Krankenhaus-Einrichtungs Geschellschaft m. b. H., 20-21 Johannisstrasse, Berlin, and Karl Albert Scherer, 113 Hartwigstrasse, Berlin-Pankow.

317,695. (April 25, 1917.) Packing with rubber ring, particularly for coolers with interchangeable parts. Süddeutsche Kuhlerfabrik, Feuerbach, Wurttenberg.

TRADE MARKS.

THE UNITED STATES.

No. 113,368. The word Endurance—rubber composition soles, half soles, and heels. The Marathon Tire & Rubber Co., Cuyahoga Falls, O.

113,369. The word Speed—rubber and composition soles, half-soles, and heels. The Marathon Tire & Rubber Co., Cuyahoga Falls, O.

115,139. The word Alwrite—fountain pens, etc. A. T. Cross Pencil Co., Providence, R. I.

116,595. Representation of a stone against a wheel with a tire on it—boots, overshoes, pacs, gum shoes, arctics, and gaiters, of rubber and fabric or felt. Firestone Tire & Rubber Co., Akron, O.

116,618. The word American—game balls of all kinds having rubber bladders or cores, rubber home-plates, etc. Simmons Hardware Co., St. Louis, Mo.

116,659. Representation of a life-saver behind the word Teethsaver—toothache gum, etc. The F. M. Keeler Co., Boston, Mass.

117,282. The word Kippy—boots and shoes made wholly or partly of leather, rubber, or fabric. Slater & Morrill, Inc., South Braintree, Mass.

118,446. Representation of a label bearing inside of scroll-work a lady's boot with an elastic gusset—elastic gusset webs. W. Preston & Son, Limited, Leicester, England.

119,163. Representation of two Brownie-type figures with the words "Moore's Fountain Pens" between—fountain pens. The Moore Pen Co., Boston, Mass.

119,301. The words Mi Babi Dainti—sanitary baby pants. M. S. George, St. Louis, Mo.

119,302. The words Mi Ladi Dainti—ladies' sanitary aprons, etc. M. S. George, St. Louis, Mo.

119,460. The words E-Z Blow—toy balloons. The Western Reserve Rubber Co., Kenmore, O.

121,042. The word Railroad—tires. Ira V. Humphrey, Philadelphia, Pa.

121,466. Representation of a yellow panel bearing a star within a diamond above a facsimile of the signature "Eberhard Faber" and the printed words Eberhard Faber, New York, Oldest Pencil Factory in America—erasers, rubber bands, etc. Eberhard Faber, New York and Brooklyn, N. Y.

121,644. Representation of a tire within which a comic face is formed by fancy lettering of the word Shurfix and the words Laughs at punctures—filler for pneumatic tires. Shurefix Manufacturing Co., Seattle, Wash.

121,882. The word Thrift—rubber and canvas shoes. United States Rubber Co., New York City and New Brunswick, N. J.

121,900. The letters and word O and G—rubber belting, hose, machinery packing, etc. Imperial Belting Co., Chicago, Ill.

121,948. The word Sculpté—hollow and solid rubber tires for heavy and other vehicles, rubber covers and casings for tires, all with anti-skid rubber ribs. Société Generale des Etablissements Bergougnan, Clermont-Ferrand, France.

122,375. The word Usco—rubber and rubber and fabric gloves and bathing caps. United States Rubber Co., New Brunswick, N. J., and New York City.

122,633. A white disk on the end of a fountain pen—fountain pens. The Evans Dollar Pen Co., Waterloo, Ia.

122,885. The words Para-Tite—material for patching pneumatic tires, inner tubes, and other rubber articles. The Federal Rubber Co., Cudahy, Wis.

123,408. The word Grainster on a shield—fabric and rubber conveyer belts. United States Rubber Co., New Brunswick, N. J., and New York City.

124,770. The word McGraw—rubber tires and tubes. The McGraw Tire & Rubber Co., East Palestine, O.

DESIGNS.

THE UNITED STATES.

No. 54,229. Rubber sole-pad for boots and shoes. Patented December 2, 1919. Term 14 years. L. R. Bandler, New York City, assignor by mesne assignments to Pioneer Products, Inc., Malone—both in New York.

54,230. Rubber sole-pad for boots and shoes. Patented December 2, 1919. Term 14 years. L. R. Bandler, New York City, assignor by mesne assignments to Pioneer Products, Inc., Malone—both in New York.

54,231. Rubber heel-pad for boots and shoes. Patented December 2, 1919. Term 14 years. L. R. Bandler, New York City, assignor by mesne assignments to Pioneer Products, Inc., Malone—both in New York.

54,236. Tire casing. Patented December 9, 1919. Term 14 years. F. H. Brewster, assignor to The Madison Tire & Rubber Co., Inc.—both of Buffalo, N. Y.

54,237. Tire casing. Patented December 9, 1919. Term 14 years. F. H. Brewster, assignor to The Madison Tire & Rubber Co., Inc.—both of Buffalo, N. Y.

54,246. Tire casing. Patented December 9, 1919. Term 14 years. F. S. Dickinson, New York City.

54,247. Tire casing. Patented December 9, 1919. Term 14 years. F. S. Dickinson, New York City.

54,248. Tire casing. Patented December 9, 1919. Term 14 years. E. N. Downes, Charlotte, N. C.

54,255. Tire. Patented December 9, 1919. Term 7 years. C. C. Gates, Denver, Colo.

54,261. Tire. Patented December 9, 1919. Term 14 years. E. Hopkinson, New York City.

54,262. Tire. Patented December 9, 1919. Term 14 years. G. Hubach, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls—both in Massachusetts.

54,263. Tire. Patented December 9, 1919. Term 14 years. G. Hubach, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls—both in Massachusetts.

54,264. Tire. Patented December 9, 1919. Term 14 years. G. Hubach, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls—both in Massachusetts.

54,273. Tire cover. Patented December 9, 1919. Term 14 years. P. M. Lockwood, Kansas City, Mo.

54,274. Tire cover. Patented December 9, 1919. Term 14 years. P. M. Lockwood, Kansas City, Mo.

54,275. Tire cover. Patented December 9, 1919. Term 14 years. P. M. Lockwood, Kansas City, Mo.

54,276. Tire. Patented December 9, 1919. Term 7 years. C. W. McKone, assignor to The Gordon Tire & Rubber Co.—both of Canton, O.

54,278. Tire. Patented December 9, 1919. Term 14 years. C. E. Murray, Jr., assignor to Empire Rubbber & Tire Co.—both of Trenton, N. J.

54,281. Tire. Patented December 9, 1919. Term 14 years. F. C. Plouf, Minneapolis, Minn.

54,286. Tire. Patented December 9, 1919. Term 7 years. C. Spreckels, Coronado, assignor to The Savage Tire Co., San Diego—both in California.

54,287. Tire. Patented December 9, 1919. Term 7 years. C. Spreckels, Coronado, asssignor to The Savage Tire Co., San Diego—both in California.

54,290. Tire casing. Patented December 9, 1919. Term 14 years. K. H. Stubenvoll, assignor to Gillette Rubber Co.—both of Eau Claire, Wis.

54,291. Tire. Patented December 9, 1919. Term 7 years. J. Tenney, Jr., Plainfield, N. J.

54,306. Tire tread. Patented December 23, 1919. Term 14 years. F. E. Burrall, assignor to Liberty Tire & Rubber Co.—both of Green Bay, Wis.

54,318. Pneumatic tire. Patented December 23, 1919. Term 14 years. A. Hargraves, Akron, O., assignor to Proehl Tire & Rubber Co., Chicago, Ill.

54,321. Tire tread. Patented December 23, 1919. Term 14 years. H. L. Kenyon, Satauket, N. Y.

54,324. Tire. Patented December 23, 1919. Term 14 years. J. W. Maguire, assignor to The Brunswick-Balke-Collender Co.—both of Chicago, Ill.

54,329. Tire. Patented December 23, 1919. Term 14 years. G. Nowick, Kansas City, Mo.

54,330. Tire casing. Patented December 23, 1919. Term 7 years. W. C. Owen, Cleveland, O.

54,337. Tire. Patented December 23, 1919. Term 3½ years. F. W. Smith, Rutherford, N. J.

54,345. Square tire. Patented December 23, 1919. Term 7 years. T. Zeger, Sharpsburg, Pa.

JUDICIAL DECISIONS.

General Electric Co. *vs.* Continental Fibre Co.—United States Circuit Court of Appeals, Second Circuit, February 13, 1919.

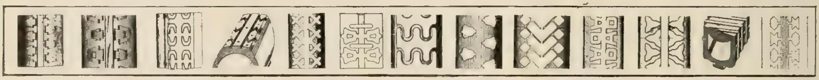
Infringement of Patent No. 1,061,770. Miller made a gear or cog-wheel of highly compressed cotton, held under compression by metallic end plates secured by rivets passing through the cotton. Defendant makes disks of cotton duck impregnated with bakelite, 60 per cent duck and 40 per cent bakelite, which can be cut into gears. Held that, when used for gears, it violated Miller's Patent. ("The Official Gazette," United States Patent Office, November 4, 1919.) ("Federal Reporter," Volume 256, page 660.)

High Court of Justice—Chancery Division. Before Mr. Justice Sargant. November 13, 1919.

In the matter of Muir's Patent. Petition for extension. This is a device for absorbing the shock to a vehicle from striking the road, by means of arranging a vacant space around the hub, which is partly filled with balls or rollers or other forms of wood or metal. The hub may be cushioned with rubber or other resilient substance. The invention may do away with the need for pneumatic tires and is now employed on motor omnibuses, motor trucks and on heavy cars, so that solid rubber tires may be fitted instead of pneumatic tires. The Court extended the patent for seven years. ("Supplement, The Illustrated Official Journal [Patents]," London, England, December 17, 1919.)

In re Mutual Motors Co. Petition of Firestone Tire & Rubber Co.—District Court, Eastern Division of Michigan, Southern District, July 22, 1919.

54,236 54,237 54,255 54,262 54,263 54,264 54,276 54,286 54,287 54,291 54,321 54,324 54,337 54,347



54,246 54,247 54,248 54,261 54,278 54,281 54,290 54,306 54,318 54,329 54,330 54,345 54,348

54,347. Tire casing. Patented December 30, 1919. Term 7 years. J. D. Comstock, assignor to The Cord Tire Corp.—both of Chester, W. Va.

54,348. Tire. Patented December 30, 1919. Term 7 years. H. G. Egbert, Dayton, O.

THE DOMINION OF CANADA.

4,689. Tire tread. Patented November 25, 1919. The Gregory Tire & Rubber Co., Limited, Vancouver, B. C.

4,694. Clamp for windshield wings. J. C., J. J., and E. E. Palmer, trading as Royal Simplex Wind Deflector Co., Toronto, Ont.

CHEMISTS AVAILABLE FOR RUBBER WORK.

The Chemical Warfare Service of the War Department has established an employment bureau under the charge of Major Frederick M. Crossett as director, which is ready to supply skilled chemists to any business that requires their services.

The Government employed 5,400 chemists during the war, who could not hope to obtain honors or distinction for their work. Many of these are unable to go back to the work they did before, owing to the changed conditions. The director has a list of chemists who can be used in the rubber industries.

On the Mutual Motors Co. becoming bankrupt, the Firestone Tire & Rubber Co. endeavored to regain tires and other rubber goods that were in the possession of the Mutual Motors Co., claiming that they had been sold on consignment. The Court, Tuttle, J., delivering the opinion, held that the sale was absolute. Petition not granted. ("Federal Reporter," Volume 260, page 341.)

THE METRIC SYSTEM EXPLAINED.

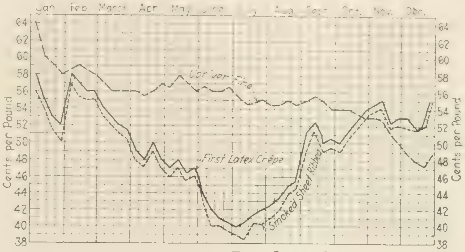
Learn only the units, dollar, meter, liter, gram—dollar, the measure of value; meter, the measure of length; liter, measure of bulk; gram, for weight. You know all about the American dollar. The metric units, meter, liter, gram, are just like dollar, divided decimally and multiplied decimally. If you want to compare metric units with present units, the meter is 10 per cent more than the yard; 500 grams is about 10 per cent more than the pound avoirdupois, the liter is 5 per cent less than the United States liquid quart (13 per cent less than the British liquid quart).

The Spot Crude Rubber Market During 1919.

As was announced in the middle of December, 1918, government restrictions on rubber imports were removed in January and at the same time the armistice began to set ocean transport free so that a decline in prices was to be looked for with the increase in supply. During January, first latex crêpe dropped gradually from 58 cents on January 7 to 52 cents on January 27 and ribbed smoked sheet dropped with it from 56 cents to 50 cents, while the price of upriver fine went from 64¼ cents down to 58 cents.

Early in February large orders were placed by manufacturers, the demand for plantations was active and it seemed as if prices would go up again. The spurt was followed by a reaction which sent the price down steadily not only to the end of the month, but until the middle of the summer, when, aided by large arrivals, the bottom price of the year, 40 cents, was reached. On February 4 first latex crêpe was 58 cents again, as was upriver fine; on February 27 the prices were 55 cents for first latex crêpe and 58 cents for upriver fine.

During March the market was stagnant, there was little demand from buyers, and prices continued to go down. The Pará rubbers reached the level of between 55 and 56 cents, at which upriver fine remained for several months, further decline being checked partly by the holding back of rubber exports by Brazilian financial institutions. First latex crêpe which was 55 cents on March 4 sold for 51½ cents on March 28 and ribbed smoked sheets kept at one cent below the latex price.



Fluctuations of Upriver Fine, First Latex Crêpe and Smoked Sheet Ribbed Spot Rubber During 1919.

In April the market continued dull, plantation grades declined steadily owing to heavy arrivals and little demand. On April 4 first latex crêpe sold for 49 cents. In the middle of the month there was a little animation which sent the price up to 50 cents, but by April 29 it was down again to 48 cents. Some demand for Pará kept the price of upriver fine at 56 cents.

May again was dull for crude rubber, though the price of plantations kept steady owing to oversupply. On May 3, first latex crêpe was at 47 cents; it rose to a cent above, sank to half a cent lower, and by May 28 was at 47 cents again. Upriver fine selling for 56 cents at the beginning of May, rose to 58 cents and dropped again to 56½ cents at the close of the month.

The same story of dull markets is true for June, except that the price of plantations dropped sharply; on June 7 first latex crêpe sold at 44 cents, by June 28 it was selling at 40 to 41 cents. The Pará prices were kept steady, upriver fine staying at 56 to 56½ cents in New York, while 66 cents was asked for it in Pará.

In July the bottom was reached for plantation rubber, arrivals were heavy, manufacturers would not buy and holders would not sell at the prevailing prices, as they expected Germany to but heavily, so first latex crêpe reached 40 cents and ribbed smoked sheets 38½ cents; by the end of the month, however, prices had started on the upward course in which they were to continue during the rest of the year. July 1 latex crêpe sold for 42½ cents, July 31 it had returned to 42 cents. Upriver fine sank also a little with the plantation rubbers, selling for a time at 54½ cents; July 1 it was at 55 cents and also on July 31.

During August the market improved slowly, but steadily; manufacturers began to buy and prices were firm, though there was plenty of rubber on hand. August 1 first latex crêpe sold for 41½ cents; August 25 it sold for 45½ cents. The Pará market was quiet with upriver fine at 54¾ cents at the beginning and close of the month.

With September a remarkable advance began in plantations, which with some breaks, continued to the end of 1920. Manufacturers of tires and of all rubber goods bought heavily and seemed ready to pay any price for the rubber they wanted. While there was speculation, the demand came from consumers. First latex crêpe at 45½ cents on August 30 sold for 51½ in the first week and 52½ in the second week of September and was selling for 50½ on September 29. The Brazil market was quiet and inactive, with upriver fine at 55 cents on September 6 and at 54 cents on September 29.

Throughout October the market continued firm with increasing demand from the factories for plantation, while the Brazilian market was practically dead. During the month the prices of both latex crêpe and smoked sheets rose above that of upriver fine. October 3 the price of first latex crêpe was 50 cents, on October 31 it was 54 cents; at the same date ribbed smoked sheets were 53 cents. Upriver fine was quoted at 54 cents on October 3 and at 53 cents on October 31.

The rise in plantations continued till the middle of November, when there came a temporary drop. The demand of the manufacturers fell off and prices were affected also by the drop in sterling exchange. First latex crêpe at 54 cents on November 1 rose to 55 cents the next week and then dropped, standing at 52½ cents on November 27. There was a like drop in Pará, upriver fine selling at 53½ cents November 1 and at 51 cents November 27.

The crude rubber market continued steady throughout December, taking a sudden rise for plantations in the last week. The steadiness was attributed in part to the firm handling of the Singapore and London markets, but it was due also to the continued demand. December 2 the price for first latex crêpe was 53 cents, December 31 it was 55 cents. It is remarkable that ribbed smoked sheets sold for the same as first latex crêpe, 52½ to 53 cents on December 2, and 55 cents on December 31. There was a further drop in Brazilian rubber, upriver fine selling for 49 cents on December 2 and 31, but having sunk to 47½ cents in the interval.

Upriver fine, which sold at 64¼ cents at the beginning of January, 1919, had fallen to 49 cents on December 31; first latex crêpe sold at 58 cents on January 1, and at 55 cents on December 31, and ribbed smoked sheets at 56 cents on January 1, and 55 cents on December 31.

Rubber estates in the Straits Settlements, which have depended heretofore wholly on cheap coolie labor, are now considering the use of agricultural machinery, such as tractors and harvesters, because there is a shortage of the labor and a general shortage of rice, the principal food throughout the Far East.

Review of the Crude Rubber Market.

NEW YORK.

The crude rubber market, after declining slightly in the first week of January remained very steady throughout the month, falling off a little at the close. The variations were chiefly speculative, but holders maintained their prices, declining to concede the fraction of a cent asked for by bidders. There is a large stock on hand, but not more than will satisfy the anticipated demand. Plantation rubber still commands a higher price than the best grades of Brazilian.

Prices for plantation and South American rubber at the beginning and toward the end of the month are shown in the following quotations:

PLANTATIONS. January 2, first latex crêpe, spot 55¼ cents, futures 55½-55¾ cents; January 26, spot 52 cents, futures 53-53[illegible] cents.

January 2, ribbed smoked sheets 55 cents, futures 55-55½ cents; January 26, spot 52 cents, March-June 52¼ cents, July-December 53¼ cents.

January 2, No. 1, amber crêpe, spot 52½-53 cents, futures 53 cents; January 26, spot 52 cents, futures 52½ cents.

January 2, clear thin brown crêpe, spot 49 cents, futures 49-49½ cents; January 26, spot 48 cents, futures 48 cents.

January 2, No. 1 roll brown crêpe 42 cents to 42½ cents, futures 43 cents; January 26, spot 42 cents, futures 42 cents.

SOUTH AMERICAN PARÁS AND CAUCHO. January 2, spot prices, upriver fine 49½-50 cents, islands fine 48 cents, upriver coarse, 37 cents, islands coarse 24 cents, Cametá coarse 23½-24 cents, caucho ball 35-35½ cents. January 26, upriver fine 47 cents, islands fine 45½ cents, upriver coarse 34½ cents, islands coarse 21 cents, Cametá coarse 23½ cents, Caucho ball 34 cents.

NEW YORK QUOTATIONS.

Following are the New York spot quotations, for one year ago, one month ago and on January 26, the current date:

	February 1, 1919.	January 1, 1920.	January 26, 1920.
PLANTATION HEVEA—			
First latex crêpe	$0.51½ @	$0.55 @	$0.52¼ @
Amber crêpe No. 1	.49 @	.53 @	.52 @
Amber crêpe No. 2	.48 @	.52 @	.51 @
Amber crêpe No. 3	.47 @	.51 @	.50 @
Amber crêpe No. 4	.46 @	.49 @	.48 @
Brown crêpe, thick and thin clean	.46 @	.49 @	.48 @
Brown crêpe, thin specky	.40 @	.45 @	.46 @
Brown crêpe, rolled	.33 @	.43½ @	.42 @
Smoked sheet, ribbed, standard quality	.50 @	.55 @	.52 @
Smoked sheets, plain, standard quality	.49 @	.50 @	.51 @
Unsmoked sheet, standard quality	.48 @	.48 @	.48 @
Colombo scrap No. 1	.35 @	.38 @	.37 @
Colombo scrap No. 2	.33 @	.36 @	.35 @
EAST INDIAN—			
Assam crêpe	*.36 @	.49 @ .50	.46 @ .47
Assam onions	*.44 @	@	.46 @ .48
Penang block scrap	.37 @	.38½ @	.38 @
PONTIANAK—			
Banjermassin	.13¾ @	.13 @	.13 @
Palembang	.16 @	.14 @	@
Pressed block	.21 @	.24 @	.27 @
Sarawak	.12 @	.12 @	.11 @
SOUTH AMERICAN—			
PARAS—			
Upriver fine	.58½ @	.50 @	.47 @
Upriver medium	.53 @	@	.39 @
Upriver coarse	.34½ @	.37 @	.34 @
Upriver weak, fine	.45 @	.40 @	.37 @
Islands, fine	.49 @ .50	.47 @	.45 @
Islands, medium	@	.47 @ .48	.45 @
Islands, coarse	.43 @ .44	.22 @	.22 @
Cametá, coarse	.23½ @	.24 @ .25	.23 @
Madeira, fine	@	.51 @ .52	.47 @
Acre Bolivian, fine	*.55 @	.51 @ .52	.47 @
Peruvian fine	*.56 @	.51 @ .52	.47 @
Tapajos fine	*.55 @	.50 @	.46 @
CAUCHO—			
Lower caucho ball	.32 @	.29½ @	.30 @
Upper caucho ball	.34 @	.34½ @	.34 @

	February 1, 1919.	January 1, 1920.	January 26, 1920.
SOUTH AMERICAN—			
MANICOBAS—			
Ceara negro heads	@	@	.35 @
Ceara scrap	@	@	.32 @
Manicoba (30% guarantee)	.40 @	@	.26 @
Mangabeira thin sheet	.38 @	@	.35 @
CENTRALS—			
Corinto scrap	.36 @	.34½ @ .35	.33 @
Esmeralda sausage	.36 @	.34½ @ .35	.33 @
Central scrap	.36 @	.34 @	.32 @
Central scrap and strip	.33 @	.32 @ .33	.30 @ .31½
Central wet sheet	.24 @	.23 @	.23 @
Guayule (20% guarantee)	.33 @	.28 @	.27 @
Guayule, washed and dried	.46 @	.38 @	.37 @
AFRICANS—			
Niger flake, prime	.25 @	.18 @	.18 @
Benguela, extra No. 1, 28%	.32 @	@	.27 @
Benguela, No. 2, 32½%	.30 @	@	@
Congo prime, black upper	.46 @	.37 @	.39 @
Congo prime, red upper	.46 @	@	.37 @
Kassai black	@	.37 @	.40 @
Rio Nunez ball	*.55 @	@	@
Rio Nunez sheets and strings	*.55 @	.40 @	.40 @
Conakry niggers	*.55 @	.40 @	.40 @
Massai sheets and strings	*.55 @	.40 @	.40 @
GUTTA PERCHA—			
Gutta Siak	.24 @ .25	.27½ @	.26 @
Red Macassar	2.90 @ 3.00	2.60 @	2.90 @
BALATA—			
Block, Ciudad, Bolivar	.72 @	.59 @	.56 @
Colombia	.66 @	.53 @	.50 @
Panama	.56 @	.45 @	.46 @
Surinam sheet	.88 @	.86 @	.82 @
amber	.90 @	.90 @	.84 @

*Nominal.

RECLAIMED RUBBER.

The market for reclaimed rubber during January exhibited the renewal of active demand on the part of users of this product to a gratifying extent. In all lines prices are firm at advances over quotations of a month ago, except in the case of white reclaim, which remains steady.

The demand may be described as active for near by deliveries. Future commitments are not markedly in evidence at the present time.

NEW YORK QUOTATIONS.

January 26, 1920.

Prices subject to change without notice.

Standard reclaims:	
Floating	$0.30 @ $0.35
Friction	.35 @ .40
Mechanical	.12½ @ .13½
Red	.23 @ .24
Shoe	.16 @ .16½
Tires, auto	.16 @ .17
truck	.13 @ .14
White	.22 @ .25

COMPARATIVE HIGH AND LOW SPOT RUBBER PRICES.

January.

	1920.*	1919. Allocated and Free.	1918.
First latex crêpe	$0.55¼ @ .53	$0.58 @ .52	$0.59 @ .52½
Smoked sheet ribbed	.55 @ .53	.56 @ .51	.58 @ .50
Upriver fine	.50 @ .49½	.61 @ .58½	.63 @ .57
Upriver coarse	.37 @ .35½	.36 @ .34	.42 @ .37
Islands fine	.48 @ .46	.54 @ .49	.51 @ .47
Islands coarse	.24 @ .22½	.36 @ .22¾	.26½ @ .24½
Cametá	.24 @ .23½	.25 @ .23	.26½ @ .24½

*Figured only to January 27, 1920.

THE MARKET FOR COMMERCIAL PAPER.

In regard to the financial situation, Albert B. Beers, broker in crude rubber and commercial paper, No. 68 William street, New York City, advises as follows:

"During January there has been a fair demand for paper, mostly from out-of-town banks, and early in the month rates were about 6 per cent for the best rubber names, but at the end of the month buyers wanted 6¼ per cent and 6½ per cent on almost everything. It looks as though rates will rule very firm for some time yet."

ANTWERP RUBBER MARKET.

GRISAR & CO., Antwerp, report [December 24, 1919]:

The market remained quiet during the past week and we close with nearly the same quotations. The stock in Antwerp was about 837 tons. Business in futures is steady with no noticeable change. Prices at closing were from 10.60 to 10.55 francs.

SINGAPORE WEEKLY RUBBER REPORT.

GUTHRIE & CO., LIMITED, Singapore, report [December 4, 1919]: In sympathy with London and New York, there was a good demand for all grades at slightly higher values than last week at the auctions which opened Wednesday. Fine pale crêpe sold at up to 99½ cents or 3 cents better than last auction. Ribber smoked sheet realized up to $1 per pound (seven lots sold at $1.01 and six lots at $1.00½) or 2½ cents dearer than last week's price.

The lower grades were readily taken up at 2/4½ cents above last week's figures.

Out of 1,170 tons catalogd 1,077 tons were offered and 770 tons sold.

The following is the course of values:

	In Singapore, per Pound.[1]	Sterling equivalent per Pound in London.
Sheet, fine ribbed smoked	96c @ 100c	2/ 5⅜ @ 2/ 6½
Sheet, good ribbed smoked	90 @ 95½	2/ 3⅝ @ 2/ 5¼
Crêpe, fine pale	95½ @ 99½	2/ 5¾ @ 2/ 6⅞
Crêpe, good pale	88 @ 95	2/ 3⅝ @ 2/ 5⅝

[1]Quoted in S. S. currency—$1 equals $0.567.

BATAVIA RUBBER MARKET.

HERMANS, MARSMAN & CO., Batavia, report [October 16-November 15, 1919]:

The market opened weak, with small demand for prime smoked sheets at 1.34 guilders for spot and 1.36 for forward delivery. During the first week of November the market improved considerably and prices advanced as far as 1.41-1.46 guilders for prime smoked sheets and first pale crêpe. The market closed weaker, with quotations of 3 cents lower. Little attention was shown to off-qualities and lower grades. The quotations are:

	In Batavia Per ½-kilo.[1] Guilders.	Equivalent Per ½-kilo in U. S. Currency.
First pale crêpe	1.43	$0.572
Prime smoked sheets	1.43	0.572

[1]Quoted per ½-kilo (1.1 pounds) in Dutch Indian guilders ($0.40).

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official report from Singapore states that the export of plantation rubber from Straits Settlements ports in the month of November was 13,426 tons as against 8,338 tons in October and 2,661 tons in the corresponding month last year. The total export for eleven months of the current year amounted to 131,716 tons, compared with 57,537 tons in 1918 and 66,589 tons in 1917. Comparative statistics follow:

	1917.	1918.	1919.
January ... *tons*	3,562	4,302	14,404
February	6,495	2,334	15,661
March	8,299	8,858	20,908
April	6,103	6,584	10,848
May	6,282	13,587	15,845
June	8,775	6,515	5,059
July	7,351	1,978	7,818
August	3,786	1,249	8,933
September	5,679	6,209	10,476
October	4,702	3,260	8,338
November	5,555	2,661	13,426
Totals	66,589	57,537	131,716

CRUDE RUBBER ARRIVALS AT ATLANTIC AND PACIFIC PORTS AS STATED BY SHIPS' MANIFESTS.

PARAS AND CAUCHO AT NEW YORK.

	Pounds.					
	Fine.	Medium.	Coarse.	Caucho.	Mixed Rubber.	Total Pounds.
DECEMBER 25. By the S. S. *Portfield*, from Pará.						
Meyer & Brown, Inc.	......	......	......	16,512	......	16,512
H. A. Astlett & Co.	25,970	......	13,100	1,750	......	40,820
JANUARY 5. By the S. S. *Denis*, from Pará						
General Rubber Co.	42,148	3,598	14,392	......	......	60,138
H. A. Astlett & Co.	25,970	......	13,100	1,700	......	40,820
Raw Products Co.	12,593	9,766	33,924	......	......	56,283
A. Latham & Co.	24.672	6,939	21,845	......	......	53,456
Gaston, Williams & Wigmore	32,382	771	34,838	......	......	67,991
Poel & Kelly	......	......	29,041	......	......	29,041
G. Amsinck & Co., Inc.	21,331	4,883	2,570	......	......	28,784
Cowdrey & Co.	5,140	771	257	......	......	6,168
Meyer & Brown, Inc.	55,125	......	......	......	......	55,125
F. R. Henderson & Co.	36,680	......	62,240	......	4,480	103,400
H. A. Astlett & Co.	42,720	......	52,130	......	......	94,850
Various	......	......	10,000	16,000	......	26,000
JANUARY 8. By the S. S. *Dade County*, from Pará and Manáos.						
Gaston, Williams & Wigmore	12,316	......	11,220	2,640	......	26,176
Paul Bertuch	220,460	......	37,036	......	......	257,496
H. A. Astlett & Co.	126,200	......	131,500	25,350	......	283,050
Various	......	......	29,040	......	......	29,040
JANUARY 9. By the S. S *Browning*, from Pará.						
G. Amsinck & Co., Inc.	......	......	......	......	......	140,976
F. R. Henderson & Co.	7,620	......	22,400	......	......	30,020
H. A. Astlett & Co.	......	......	44,500	......	......	44,500
William Schall & Co.	228,494	......	27,684	80,559	......	336,737
Poel & Kelly	......	......	......	......	......	598,378
Neuss, Hesslein & Co.	......	......	......	......	......	336,292
General Rubber Co.	......	......	......	......	......	147,356

	Pounds					
	Fine.	Medium.	Coarse.	Caucho.	Mixed Rubber.	Total Pounds.
JANUARY 19. By the S. S. *Panama*, from Cristobal.						
William Schall & Co.	......	......	......	1,768	......	1,768
JANUARY 20. By the S. S. *Polycarp*, from Pará and Manáos						
Paul Bertuch	79,721	749	73,657	45,194	......	199,301
Meyer & Brown, Inc.	91,741	......	24,511	2,476	......	118,764
F. R. Henderson & Co.	4,480	......	22,400	13,440	......	40,320
H. A. Astlett & Co.	203,280	......	246,260	27,100	......	476,640
Hagemeyer & Brunn	318,660	......	......	......	......	318,660

PLANTATIONS.

Figured 180 pounds to the bale or case.

	Shipment from:	Shipped to:	Pounds	Totals.
DECEMBER 19. By the S. S. *Carmania*, at New York.				
Poel & Kelly	Liverpool	New York	45,180	
General Rubber Co.	Liverpool	New York	26,280	
Rubber Trading Co.	Liverpool	New York	2,240	163,980
Various	Liverpool	New York	90,280	
DECEMBER 19. By the S. S. *Baltic*, at New York.				
Thornett & Fehr	Liverpool	New York	210.240	210,240
DECEMBER 19. By the S. S. *Rotterdam*, at New York.				
Pablo Hermanos	Rotterdam	New York	16,920	
Joosten & Janssen	Rotterdam	New York	407,340	
Hood Rubber Co.	Rotterdam	Watertown	15.230	
Meyer & Brown, Inc.	Rotterdam	New York	245,280	
Various	Rotterdam	New York	38,170	722,940
DECEMBER 20. By the S. S. *Clan MacGillivray*, at New York.				
Hood Rubber Co.	Colombo	Watertown	11,200	
Meyer & Brown, Inc.	Colombo	New York	473,760	
F. R. Henderson & Co.	Colombo	New York	274,000	
L. Littlejohn & Co., Inc.	Colombo	New York	190,400	
Fred Stern & Co.	Colombo	New York	44,000	993,360
DECEMBER 21. By the S. S. *Nitorian*, at Boston.				
Hood Rubber Co.	London	Watertown	339,063	339,063
DECEMBER 21. By the S. S. *Bolton Castle*, at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	1,120,000	
William H. Stiles & Co.	Singapore	New York	159,300	
Rubber Trading Co.	Singapore	New York	123,200	
Fred Stern & Co.	Singapore	New York	154,000	
F. W. Frost & Co.	Singapore	New York	11,160	
Rogers-Pyatt Shellac Co.	Singapore	New York	38,880	
T. A. Desmond & Co.	Singapore	New York	214,200	
Thornett & Fehr	Singapore	New York	67,500	
W. R. Grace & Co.	Singapore	New York	16,740	
Chas. T. Wilson & Co., Inc.	Singapore	New York	60,660	
J. T. Johnstone & Co.	Singapore	New York	325,500	
F. R. Henderson & Co.	Singapore	New York	1,260,017	
The Fisk Rubber Co.	Singapore	New York	112,680	
Poel & Kelly	Singapore	New York	244,800	
Rubber Importers & Dealers Co., Inc.	Singapore	New York	410,400	
Edward Maurer Co., Inc.	Singapore	New York	134,640	
Robinson & Co.	Singapore	New York	111,660	
Meyer & Brown, Inc.	Singapore	New York	56,000	
Pell & Dumont	Singapore	New York	100,800	
General Rubber Co.	Singapore	New York	355,140	
The Goodyear Tire & Rubber Co.	Singapore	Akron, Ohio	725,940	
Hood Rubber Co.	Penang	Watertown	114,374	
Aldens' Successors, Inc.	Singapore	New York	11,160	6,070,521
Various	P'rt Sw't'nh'm	New York	44,820	
Various	Singapore	New York	98,190	
DECEMBER 25. By S. S. *Orduna*, at New York.				
Poel & Kelly	Liverpool	New York	36,360	
The B. F. Goodrich Co.	Liverpool	Akron	163,800	
W. R. Grace & Co.	Liverpool	New York	58,320	
J. T. Johnstone & Co., Inc.	Liverpool	New York	34,740	293,220
DECEMBER 26. By the S. S. *Toyohoshi Maru*, at New York.				
G. Kawahara Co.	Kobe	New York	75,000	
Gaston Williams & Wigmore	Singapore	New York	103,500	
L. Littlejohn & Co., Inc.	Singapore	New York	47,880	
Mitsui & Co., Limited	Singapore	New York	35,100	
F. R. Henderson & Co.	Singapore	New York	220,760	
Pacific Trading Co.	Singapore	New York	68,490	
Various	Singapore	New York	183 600	734,330
DECEMBER 26. By the S. S. *Port Chalmers*, at New York.				
Chas. T. Wilson Co., Inc.	London	New York	375,000	
Meyer & Brown, Inc.	London	New York	44,820	
Poel & Kelly	London	New York	696.620	
R. F. Downing & Co.	London	New York	52,020	
F. R. Henderson & Co.	London	New York	299,747	
Various	London	New York	3,910.833	5,379,040
DECEMBER 27. By the S. S. *Louis Luckenbach*, at New York				
Joosten & Janssen	Rotterdam	New York	15,480	15,480
DECEMBER 28. By the S. S. *Adriatic*, at New York.				
Brandt's Sons	Southampton	New York	38 700	
Barney Bros. & Co.	Southampton	New York	494,280	
Various	Southampton	New York	187,380	720,360
DECEMBER 29. By the S. S. *Yetorofu Maru*, at New York.				
Chas. T. Wilson Co., Inc.	Singapore	New York	13,500	
Winter, Ross & Co.	Singapore	New York	76,320	
C. T. Trevanion & Co.	Singapore	New York	48,600	
Smith & Schippers	Singapore	New York	14,580	
Meyer & Brown, Inc.	Singapore	New York	404 685	
Various	Singapore	New York	233,655	790,740
DECEMBER 30. By the S S. *Lancastrian*, at New York.				
Various	Antwerp	New York	247,240	247,240
DECEMBER 30. By the S. S. *Belgic*, at New York.				
General Rubber Co.	Liverpool	New York	53,820	
Various	Liverpool	New York	14,940	68,760
JANUARY 2. By the S. S. *Bassam*, at New York.				
Niger Co., Limited	Lagos	New York	107,663	107,663

PLANTATIONS.—Continued.

	Shipment from:	Shipped to:	Pounds.	Totals.
JANUARY [illegible]. By the S. S. *Nieuw Amsterdam*, at New York.				
Poel & Kelly	Rotterdam	New York	61,020	
Various	Rotterdam	New York	324,830	385,850
JANUARY [illegible]. By the S. S. *[illegible]*, at New York.				
General Rubber Co......	[illegible] Priok	New York	254,340	
[illegible] & Co.........	Batavia	New York	61,200	
Estabrooks Co., Limited.	Batavia	New York	203,940	
L. Sutro & Co.........	Soerabaya	New York	34,020	
Foreign Trade Corp....	Soerabaya	New York	6,480	
Various	Soerabaya	New York	360,540	
Various	Penang	New York	32,220	
Various	Batavia	New York	456,660	1,409,400
JANUARY 5. By the S. S. *Mesaba*, at New York.				
Chas. T. Wilson Co., Inc.	London	New York	90,585	
Rubber Trading Co.....	London	New York	31,360	196,106
Various	London	New York	74,161	
JANUARY 5. By the S. S. *Bombay Maru*, at New York.				
F. R. Henderson & Co..	Colombo	New York	67,000	
Meyer & Brown, Inc....	Colombo	New York	22,400	
Various	Colombo	New York	1,070,250	1,159,650
JANUARY 5. By the S. S. *City of Bristol*, at New York.				
Meyer & Brown, Inc...	Colombo	New York	622,062	
Chas. T. Wilson Co., Inc.	Colombo	New York	124,600	
F. R. Henderson & Co..	Colombo	New York	152,000	
Various	Colombo	New York	789,108	1,687,770
JANUARY 6. By the S. S. *Port Albany*, at New York.				
Foreign Trade Bank. Cp.	London	New York	52,740	
Poel & Kelly	London	New York	360,000	
T. D. Downing & Co...	London	New York	63,360	
Meyer & Brown, Inc...	London	New York	11,052	
F. R. Henderson & Co..	London	New York	16,518	
Rubber Trading Co.....	London	New York	52,640	
Various	London	New York	505,150	1,061,460
JANUARY 6. By the S. S. *Anglo Chilean*, at New York.				
Rubber Importers & Dealers Co., Inc..........	Liverpool	New York	115	
Poel & Kelly...........	Liverpool	New York	2,875	
F. R. Henderson & Co.	Liverpool	New York	14,145	
Rubber Trading Co....	Liverpool	New York	25,745	42,880
JANUARY 8. By the S. S. *Madiocn*, at New York.				
Goldman, Sachs & Co...	Soerabaya	New York	69,120	
Joosten & Janssen......	Soerabaya	New York	33,120	
L. Littlejohn & Co., Inc.	Soerabaya	New York	54,540	
L. Sutro & Co.........	Soerabaya	New York	74,700	
Java - Holland American Trading Co.	Soerabaya	New York	9,000	
United Malaysian Rubber Co., Limited.....	Soerabaya	New York	12,600	
Various	Soerabaya	New York	390,600	
Various	Belawan	New York	148,140	
Various	Asahan	New York	44,280	845,100
JANUARY 8. By the S. S. *Westerdyk*, at New York.				
Meyer & Brown, Inc....	Rotterdam	New York	72,148	
F. R. Henderson & Co..	Rotterdam	New York	66,166	138,314
JANUARY 11. By the *War President*, at St. John's.				
Meyer & Brown, Inc...	London	St. John's, N.F.	11,260	11,260
JANUARY 12. By the S. S. *Defiance*, at New York.				
T. D. Downing & Co...	London	New York	128,520	
Various	London	New York	134,820	263,340
JANUARY 12. By the S. S. *Treglisson*, at New York.				
The Goodyear Tire & Rubber Co.	Colombo	Akron	94,320	
C. C. Trevanion & Co...	Colombo	New York	441,000	
Fruhling & Goshen	Colombo	New York	62,100	
Meyer & Brown, Inc....	Colombo	New York	265,000	
Chas. T. Wilson Co., Inc.	Colombo	New York	125,600	988,020
JANUARY 15. By the S. S. *Clan Murdock*, at New York.				
Various	Cochin	New York	356,580	356,580
JANUARY 17. By the S. S. *Yangtsze*, at New York.				
William H. Stiles.......	Singapore	New York	536,220	
Rubber Trading Co.....	Belawan	New York	155,680	
W. G. Ryckman, Inc...	Singapore	New York	5,940	
Chas. T. Wilson Co., Inc.	Singapore	New York	179,750	
Pacific Trading Corp of America	Singapore	New York	45,540	
F. R. Henderson & Co...	Singapore	New York	510,250	
Aldens' Successors, Inc..	Singapore	New York	59,760	
The B. F. Goodrich Co..	Singapore	Akron	538,920	
The Goodyear Tire & Rubber Co.	Singapore	Akron	425,340	
J. T. Johnstone & Co., Inc.	Belawan	New York	13,500	
Boston Insulated Wire & Cable Co.	Singapore	Dorchester	5,400	
The Goodyear Tire & Rubber Co.	Deli	New York	77,760	
Edward Maurer & Co., Inc.	Singapore	New York	216,000	
Poel & Kelly	Singapore	New York	594,180	
L. Littlejohn & Co., Inc.	Singapore	New York	1,476,620	
Fred Stern & Co.......	Singapore	New York	671,940	
The General Rubber Co.	Singapore	New York	711,540	
The General Rubber Co.	Belawan	New York	17,460	
Hadden & Co..........	Singapore	New York	203,400	
Weise & Co...........	Singapore	New York	40,500	
Rubber Importers, and Dealers' Co., Inc.....	Singapore	New York	421,480	
Thornett & Fehr........	Singapore	New York	145,800	
Joosten & Janssen......	Singapore	New York	38,700	
Irwin Harrison Crosfield	Belawan	New York	57,960	
Robinson & Co.	Singapore	New York	29,960	
M. F. Sargent & Co....	Singapore	New York	51,040	
Mexican Crude Rubber Co.	Swettenham	New York	58,500	
Meyer & Brown, Inc....	Singapore	New York	403,200	
Various	Belauan	New York	193,520	
Various	Soerabaya	New York	29,880	
Various	Teluk Anson	New York	5,680	
Various	P'rt Dickson	New York	51,120	
Various	Singapore	New York	1,531,080	9,483,620
JANUARY 17. By the S. S. *City of Colombo*, at New York.				
The Goodyear Tire & Rubber Co..........	Colombo	Akron	137,880	
C. T. Wilson & Co., Inc.	Colombo	New York	318,020	
General Rubber Co.....	Colombo	New York	403,200	
Hood Rubber Co.......	Colombo	Watertown	11,220	
Rubber Trading Co.....	Colombo	New York	22,400	
Various	Colombo	New York	543,420	1,436,140
JANUARY 19. By the S. S. *Winifredian*, at Boston.				
Hood Rubber Co.......	London	Watertown	5,122	5,122
JANUARY 22. By the S. S. *Worcester*, at New York.				
Hood Rubber Co.......	London	Watertown	130,500	130,500
JANUARY 22. By the S. S. *Cedric*, at New York.				
General Rubber Co.....	Liverpool	New York	25,920	
Chas. T. Wilson Co., Inc.	Liverpool	New York	41,146	
Various	Liverpool	New York	107,460	174,526
JANUARY 23. By the S. S. *Noordam*, at New York.				
Poel & Kelly...........	Rotterdam	New York	155,520	
Meyer & Brown, Inc....	Rotterdam	New York	177,251	
Various	Rotterdam	New York	142,069	474,840
JANUARY 23. By the S. S. *Manhattan*, at New York.				
Rubber Trading Co.....	London	New York	34,160	
T. D. Downing & Co...	London	New York	108,360	
Ajax Rubber Co., Inc..	London	New York	180	
Donner & Co..........	London	New York	29,120	
Meyer & Brown, Inc...	London	New York	22,423	
Chas. T. Wilson Co., Inc.	London	New York	55,563	
Various	London	New York	932,704	1,182,510
JANUARY 23. By the S. S. *Glensanda*, at New York.				
F. R. Henderson & Co..	London	New York	112,000	
Chas. T. Wilson Co., Inc.	London	New York	241,939	
Rubber Trading Co.....	London	New York	112,000	
Various	London	New York	723,416	1,189,355
JANUARY 23. By the S. S. *Comeric*, at New York.				
Meyer & Brown, Inc....	Colombo	New York	210,560	
F. R. Henderson & Co	Colombo	New York	341,202	
Hood Rubber Co.......	Colombo	Watertown	11,210	562,972
JANUARY 23. By the S. S. *Eurylochus*, at New York.				
General Rubber Co......	Singapore	New York	156,000	
William H. Stiles & Co..	Singapore	New York	20,160	
Edward Boustead & Co..	Singapore	New York	48,600	
Meyer & Brown, Inc...	Singapore	New York	224,000	
Aldens' Successors, Inc.	Singapore	New York	173,700	
Pell & Dumont, Inc.....	Singapore	New York	86,400	
Fred Stern & Co.......	Singapore	New York	208,260	
East Asiatic Co........	Singapore	New York	129,420	
Rubber Trading Co.....	Singapore	New York	22,400	
Balfour, Williamson & Co.	Singapore	New York	63,000	
L. Littlejohn & Co., Inc.	Singapore	New York	300,600	
Poel & Kelly...........	Singapore	New York	19,800	
F. R. Henderson & Co..	Singapore	New York	58,240	
The Goodyear Tire & Rubber Co.	Singapore	Akron	327,960	
Rubber Importers' & Dealers' Co., Inc......	Singapore	New York	131,400	
W. T. Sargent & Co....	Singapore	New York	42,480	
The B. F. Goodrich Co..	Singapore	Akron	478,620	
A. S. Fox & Co........	Singapore	New York	27,000	
W. T. Sargent & Co....	Singapore	New York	42,480	
William H. Stiles & Co..	Penang	New York	79,200	
Edward Boustead & Co..	Penang	New York	87,120	
J. T. Johnstone & Co., Inc.	Pt. Swet'nh'm	New York	150,000	
J. T. Johnstone & Co., Inc.	Deli	New York	146,520	
Vernon Metal & Produce Co.	Deli	New York	12,060	
Thornett & Fehr........	Deli	New York	20,160	
Fred. Stern & Co.......	Deli	New York	89,820	
Wm. Stokes & Co......	Deli	New York	41,920	
L. Littlejohn Co., Inc...	Deli	New York	1,800	
The Fisk Rubber Co....	Deli	Chicopee F.	60,480	
A. C. Fox & Co........	Pt. Swet'nh'm	New York	28,800	
Poel & Kelly...........	Penang	New York	114,480	
Pacific Trading Co......	Penang	New York	25,200	
Various	Singapore	New York	449,280	
Various	Deli	New York	43,200	
Various	Zamboanga	New York	21,600	3,932,160
JANUARY 23. By the S. S. *Kanagawa Maru*, at New York.				
Chas. T. Wilson & Co., Inc.	Colombo	New York	96,000	
W. Reid Williams, Inc..	Colombo	New York	75,000	
Adolph Hirsch & Co., Inc.	Colombo	New York	44,800	
Poel & Kelly...........	Colombo	New York	128,,100	
Meyer & Brown, Inc...	Colombo	New York	405,400	749,300

BALATA.

	Shipment from:	Shipped to:	Pounds.	Totals.
December 18. By the S. S. *Mayaro*, at New York.				
Edward Maurer Co., Inc.	Cristobal	New York	23,400	
R. J. Dick, Ltd.	Cristobal	Passaic	214,650	
Southern Sales Corp...	Cristobal	New York	86,850	
South & Central America Commercial Co	Cristobal	New York	46,650	
American Trading Co...	Cristobal	New York	16,500	
General Export & Commercial Co.	Cristobal	New York	14,100	402,150
December 19. By the S. S. *Atenas*, at New York.				
H. Marne & Co........	Cartagena	New York	1,350	1,350
December 19. By the S. S. *Panama*, at New York.				
Wellman, Peck & Co....	Cristobal	New York	4,050	
Heilbron, Wolff & Co...	Cristobal	New York	1,050	
Ultramares Corp.	Cristobal	New York	1,140	6,240
December 20. By the S. S. *Mohican*, at New York.				
Ultramares Corp.	Port Columbia	New York	5,700	5,700
December 21. By the S. S. *Fort Gaines*, at New York.				
American Trading Co..	Cristobal	New York	3,750	3,750
December 24. By the S. S. *General G. W. Goethals*, at New York.				
Ultramares Corp.	Cristobal	New York	4,250	4,250
December 25. By the S. S. *Orduna*, at New York.				
Earle Bros.	Liverpool	New York	16,000	16,000
December 25. By the S. S. *Ancon*, at New York.				
Fidanque Bros. & Sons..	Cristobal	New York	1,850	
Hollingshurst & Co.....	Cristobal	New York	1,350	3,200
December 26. By the S. S. *Commewijne*, at New York.				
Arkell & Douglas......	Paramaribo	New York	3,360	3,360
December 26. By the S. S. *Francis*, at New York.				
R. del Castello & Co....	Cartagena	New York	5,250	5,250
December 27. By the S. S. *Maraval*, at New York.				
South & Central American Commercial Co...	British W. I. Ciudad	Bolivar	11,400	11,400
December 28. By the S. S. *Adriatic*, at New York.				
Various	Southampton	New York	1,950	1,950
December 30. By the S. S. *Thelma*, at New York.				
G. Amsinck & Co., Inc.	Cartegena	New York	6,300	6,300
January 2. By the S. S. *Colon*, at New York.				
Mecke & Co............	Cristobal	New York	3,000	
Ultramares Corp.	Cristobal	New York	6,900	
H. Wolff & Co.........	Cristobal	New York	900	10,800
January 19. By the S. S. *Cristobal*, at New York.				
Isaac Brandon & Bros...	Cristobal	New York	2,550	
P. Nephews Co.........	Cristobal	New York	900	3,450
January 19. By the S. S. *Gen. W. C. Gorgas*, at New York.				
H. Marquardt & Co....	Cristobal	New York	13,500	
Chas. E. Griffin.........	Cristobal	New York	1,350	14,850
January 23. By the S. S. *Parima*, at New York.				
Middleton & Co........	Georgetown	New York	87,000	87,000

CENTRALS.

	Shipment from:	Shipped to:	Pounds.	Totals.
December 19. By the S. S. *Panama*, at New York.				
W. R. Grace & Co.....	Cristobal	New York	4,050	
A. M. Capen's Sons....	Cristobal	New York	3,750	
Dormales & Co........	Cristobal	New York	1,170	
Mecke & Co...........	Cristobal	New York	6,750	
Willman, Peck & Co....	Cristobal	New York	1,350	
Ultramares Corp.	Cristobal	New York	300	17,370
December 24. By the S. S. *G. W. Goethals*, at New York.				
Holtrans Co., Inc.......	Cristobal	New York	15,000	
Pablo Calvet & Co......	Cristobal	New York	6,000	21,000
December 25. By the S. S. *Ancon*, at New York.				
L. Turnure & Co.....	Cristobal	New York	3,900	
American Trading Co..	Cristobal	New York	6,000	
G. Amsinck & Co., Inc..	Cristobal	New York	10,800	
Neuss, Hesslein & Co...	Cristobal	New York	5,100	
Parmelee & Co.........	Cristobal	New York	5,850	
Sembrada & Co........	Cristobal	New York	33,300	
A. M. Capen's Sons....	Cristobal	New York	3,900	
Isaac Brandon & Bros..	Cristobal	New York	1,050	
Pablo Calvet & Co.....	Cristobal	New York	30,000	
Mecke & Co............	Cristobal	New York	3,750	
Andean Trading Co....	Cristobal	New York	12,450	
Various	Cristobal	New York	33,450	149,550
December 26. By the S. S. *Carrillo*, at New York.				
Ultramares Corp.	Cartagena	New York	6,300	6,300
December 27. By the S. S. *Maraval*, at New York.				
Middleton & Co........	Trinidad	New York	13,706	13,706
December 29. By the S. S. *Tivives*, at New York.				
Isaac Brandon & Bros..	Costa Rica	New York	600	
Mecke & Co............	Cristobal	New York	6,300	
J. S. Sembrada & Co....	Cristobal	New York	1,500	
William E. Peck & Co..	Cristobal	New York	3,900	
Ultramares Corp.	Cristobal	New York	5,250	
G. Amsinck & Co., Inc..	Cristobal	New York	38,100	55,650
January 2. By the S. S. *Colon*, from Cristobol, at New York.				
J. S. Sembrada & Co., Inc.	Cristobal	New York	736	736
January 13 By the S. S. *Vindal*, at New York.				
Ultramares Corp.	Colombia	New York	300	
Andean Trading Co.....	Colombia	New York	4,200	4,500
January 16. By the S. S. *Atenas*, at New York.				
Andean Trading Co.....	P'to Colombia	New York	1,800	1,800
January 19. By the S. S. *Panama*, at New York.				
Colombia Overseas Co..	Cristobal	New York	31,800	
W. R. Grace & Co......	Cristobal	New York	3,600	
Andean Trading Co.....	Cristobal	New York	2,850	
G. Amsinck & Co., Inc..	Cristobal	New York	16,950	
Ultramares Corp.	Cristobal	New York	3,750	
Lawrence Turnure & Co.	Cristobal	New York	1,500	
J. S. Sembrada & Co...	Cristobal	New York	9,300	
O. Gordon Co..........	Cristobal	New York	17,250	
Gravenhorst & Co......	Cristobal	New York	3,450	
Various	Cristobal	New York	9,000	99,450
January 19. By the S. S. *W. C Gorgas*, at New York.				
G. Amsinck & Co., Inc..	Cristobal	New York	9,300	
Central & South American Trading Co.......	Cristobal	New York	900	
Various	Cristobal	New York	150	10,350
January 23 By the S. S. *Lake Weir*, at New York.				
Various	Puerto Barrios	New York	1,650	1,650

AFRICANS.

	Shipment from:	Shipped to:	Pounds.	Totals.
December 19. By the S. S. *Carmania*, at New York.				
Poel & Kelly...........				
Rubber Trading Co.....				
Alden's Successors, Inc..	Liverpool	New York	22,020	
December 20. By the S. S. *Canada*, at New York.				
Various	Liverpool	New York	13,440	
December 26. By the S. S. *Londonier*, at New York.				
H. Phillips	Liverpool	New York	58,182	93,642
Rubber Trading Co.....	Marseilles	New York	683,500	683,500
December 30. By the S. S. *Pesaro*, at New York.				
R. T. Downing & Co....	Antwerp	New York	12,320	
December 30. By the S. S. *Lancastrian*, at New York.				
Meyer & Brown, Inc....	Antwerp	New York	40,320	52,640
Rubber Trading Co.....	Genoa	New York	1,150	1,150
January 6. By the S. S. *Anglo Chilian*, at New York.				
The Goodyear Tire & Rubber Co.	Liverpool	Akron	16,020	
Rubber Importers' & Dealers Co., Inc..........	Liverpool	New York	12,420	
Thornett & Fehr........	Liverpool	New York	11,340	39,780
January 12. By the S. S. *Dallas*, at New York.				
Various	Marseilles	New York	329,992	329,992
January 17. By the S. S. *Yangtze*, at New York.				
Edward Boustead & Co..	Singapore	New York	15,840	15,840
January 22. By the S. S. *Pipeston County*, at New York.				
Various	Brest	New York	85,675	85,675

PONTIANAK.

	Shipment from:	Shipped to:	Pounds.	Totals.
December 21. By the S. S. *Bolton Castle*, at New York.				
Hadden & Co...........	Singapore	New York	57,300	
L. Littlejohn & Co., Inc.	Singapore	New York	13,800	
United Malaysian Co....	Singapore	New York	369,600	440,700
December 26. By the S. S. *Toyahoski Maru*, at New York.				
Mitsubishi Goshi Kaisha.	Singapore	New York	36,000	
Various	Singapore	New York	40,500	76,500
January 17. By the S. S. *Yangtsze*, at New York.				
United Malaysian Rubber Co.	Singapore	New York	442,800	
Fred Stern & Co.......	Singapore	New York	6,000	
Thos. A. Desmond & Co.	Singapore	New York	11,400	
J. T. Johnstone & Co., Inc.	Singapore	New York	11,400	
Dunbar & Co...........	Singapore	New York	22,800	
Various	Singapore	New York	45,600	540,000
January 26. By the S. S. *Euryiochus*, at New York.				
New York	40,200		Singapore	L. Littlejohn & Co., Inc.
New York	90,600		Singapore	United Malaysian Co....
New York	8,700	139,500	Singapore	Various ....

GUTTAPERCHA.

	Shipment from:	Shipped to:	Pounds.	Totals.
January 2. By the S. S. *Bassam*, at New York.				
Niger Co.	Lagos	New York	13,200	13,200
January 26. By the S. S. *Eurylochus*, at New York.				
Various	P't Sw't'nh'm	New York	1,500	1,500

GUTTAS.

	Shipment from:	Shipped to:	Pounds.	Totals.
December 21. By the S. S. *Bolton Castle*, at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	128,100	
United Malaysian Co....	Singapore	New York	96,000	224,100

MANICOBA (Ceara).

	Shipment from:	Shipped to:	Pounds.	Totals.
December 19. By the S. S. *Lancaster Castle*, at New York.				
Faria, Bosta & Co......	Buenos Aires	New York	1,760	1,760
December 26. By the S. S. *Francis*, at New York.				
Various	Ceara	New York	627,000	627,000
December 29. By the S. S. *Tapajoz*, at New York.				
J. H. Rossbach Bros....	Rio de Janeiro	New York	14,960	14,960
January 25. By the S. S. *Justin*, at New York.				
F. R. Henderson & Co..	Ceara	New York	23,383	23,383

CRUDE RUBBER ARRIVALS AT PACIFIC PORTS AS REPORTED.

PLANTATIONS.

December 27. By the S. S. *West Hartland*.					
F. R. Henderson & Co., Inc.	Singapore	Portland	New York	56,000	
Chas. T. Wilson & Co., Inc.	Singapore	Portland	New York	190,750	
Rubber Trading Co..	Singapore	Portland	New York	33,600	280,350
December 29. By the S. S. *Korea Maru*.					
F. R. Henderson & Co., Inc.	Singapore	San Fran.	New York	1,551,896	
Rubber Trading Co..	Singapore	San Fran.	New York	22,400	1,574,296
December 30. By the S. S. *Venezuela*.					
F. R. Henderson & Co., Inc.	Singapore	San Fran.	New York	162,254	162,254
January 1. By the S. S. *Tyndareus*.					
F. R. Henderson & Co., Inc.	Singapore	Seattle	New York	641,077	180,000
Chas. T. Wilson & Co., Inc.	Singapore	Seattle	New York		697,007
Rubber Trading Co..	Singapore	Seattle	New York	56,000	
January 15. By the S. S. *Empress of Russia*.					
U. S. Rubber Co....	Honkong	Vancouver	New York	342,000	342,000

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES DURING THE MONTH OF NOVEMBER, 1919.

Exports To—	Belting Hose and Packing. Value.	Boots. Pairs.	Boots. Value.	Shoes. Pairs.	Shoes. Value.	Druggists' Rubber Sundries. Value.	Tires. Automobile. Value.	Tires. All Others. Value.	Insulated Wire and Cables. Value.	All Other Manufactures of Rubber. Value.	Totals. Value.
Europe:											
Austria-Hungary			.....	....	.....	....	$3,392	....	....	....	$3,392
Belgium		......	.....	3,216	$2,014	$150	122,493	$350	$37,194	$3,347	165,548
Denmark	[illegible]	168	$560	170,663	106,608	2,015	137,010	900	5,923	11,570	267,738
Finland	[illegible]	.	....	70,372	59,380	.....	23,367	....	9,435	2,205	97,101
France	2,563	84	127	24,006	11,165	9,666	250,491	3,260	....	25,711	302,983
Germany	[illegible]	.	....	....	......	....	561	....	....	257	3,082
Greece	[illegible]		.....	2,000	2,000	1,002	2,670	......	1,200	3,000	10,075
Italy	1,211	312	821	16,680	12,665	92	19,828	18	228	14,316	49,179
Malta, Gozo, & Cyprus Islands		.....	......	....	....	......	424	....	....	....	424
Netherlands	3,101	......	.....	381	245	5,145	305,605	41,687	41,608	21,774	419,165
Norway	1,881	....	.....	126,767	91,962	50	44,871	2,019	17,698	5,928	164,409
Portugal	.	..	.....	2,702	2,345	....	69,228	711	1,835	457	74,576
Roumania	3,952	....	......	16,229	21,679	850	27,196	....	213	1,172	55,062
Russia in Europe	....	......	....	6,000	4,001	....	......	....	....	800	4,801
Spain	13	......	....	13	19	1,250	21,948	....	4,509	315	28,054
Sweden	3,993	264	2,000	211,786	138,979	6,121	115,175	14,660	3,271	7,609	291,808
Switzerland	....	672	988	4,966	4,821	....	41,880	....	443	530	48,662
Turkey in Europe	.	.....	....	189,449	157,721	....	19,883	....	....	....	177,604
England	83,535	2,057	4,361	74,075	42,361	9,684	119,081	....	63,227	215,248	537,497
Scotland	....	......	....	....	....	....	48	....	....	290	338
Totals, Europe	$104,582	3,557	$8,857	919,305	$657,965	$36,025	$1,325,151	$63,605	$186,784	$314,529	$2,701,498
North America:											
Bermuda	$29	....	....	372	$314	$342	....	$36	....	$317	$1,038
British Honduras	88	......	....	520	478	31	669	5	....	351	1,622
Canada	49,394	9,169	$30,085	5,480	9,966	29,883	33,789	4,504	$13,031	260,783	431,435
Costa Rica	656	.....	.....	....	....	30	962	311	199	468	2,626
Guatemala	2,870	....	....	376	288	467	3,387	294	183	741	8,230
Honduras	1,654	......	....	120	213	....	2,064	429	171	631	5,162
Nicaragua	1,824	....	......	50	50	1,090	4,626	....	1,880	1,039	10,509
Panama	9,281	.....	....	....	....	567	11,676	1,894	4,173	1,628	29,219
Salvador	282	....	....	....	....	105	1,184	382	....	1,316	3,269
Mexico	55,096	96	433	3,747	3,115	5,846	78,365	5,904	30,608	22,804	202,171
Miquelon, Langley, etc.	....	144	432	120	100	....	....	....	....	....	532
Newfoundland and Labrador	938	6,249	17,762	3,782	3,330	76	1,309	....	19,879	2,671	45,965
Barbados	89	....	....	408	342	....	1,281	....	45	47	1,804
Jamaica	1,138	.....	......	684	838	217	9,042	8	1,223	2,017	14,483
Trinidad and Tobago	1,740	....	....	24	19	41	8,245	1,608	97	238	11,988
Other British West Indies	79	....	....	1,327	1,333	53	4,059	105	23	561	6,213
Cuba	64,490	....	....	3,721	3,283	6,438	122,346	8,573	98,158	37,656	340,944
Danish West Indies	12	....	....	180	158	....	173	5	....	69	417
Dutch West Indies	....	....	....	....	....	13	1,659	....	....	91	1,763
French West Indies	1,301	....	....	....	....	....	6,223	884	35	109	8,752
Haiti	115	....	....	....	....	9	6,134	304	91	400	7,053
Dominican Republic	1,811	.....	....	84	59	3,217	12,899	148	638	1,633	20,405
Totals, North America	$193,087	15,658	$48,712	20,995	$23,886	$48,425	$310,092	$25,394	$170,434	$335,570	$1,155,600
South America:											
Argentina	$12,455	......	....	....	....	$1,076	$132,114	....	$25,804	$11,974	$183,423
Bolivia	3,155	.....	....	....	....	....	1,916	....	181	167	5,419
Brazil	33,029	.....	....	1,475	$1,642	2,414	60,575	$523	40,764	23,728	162,675
Chile	30,046	....	....	8	9	2,481	14,221	252	17,349	4,802	69,160
Colombia	690	....	....	1,710	1,462	819	3,338	33	6,750	1,474	14,566
Ecuador	81	....	....	20	16	128	3,480	....	2,003	556	6,264
British Guiana	16	....	......	2,080	2,037	1	4,647	51	193	39	6,984
Dutch Guiana	44	....	......	....	......	......	332	....	......	225	601
French Guiana	..	....	....	53	70	.....	70	......	......	....	140
Paraguay	366	....	....	....	....	....	....	......	......	....	366
Peru	1,661	....	....	288	465	447	19,075	....	5,342	1,903	28,893
Uruguay	180	....	....	....	....	679	51,464	.....	4,935	2,289	59,547
Venezuela	824	72	$259	154	109	405	16,714	80	369	1,410	20,170
Totals, South America	$82,547	72	$259	$5,788	$5,810	$8,450	$307,946	$939	$103,690	$48,567	$558,208
Asia:											
China	$18,867	....	....	11	$19	$1,882	$11,776	$198	$43,111	$3,001	$78,854
Japanese China	103	....	....	....	....	74	....	......	....	....	177
Chosen	5	....	....	....	...	....	3,049	....	172	512	3,738
British India	4,764	....	....	....	....	240	52,280	....	216	4,155	61,655
Straits Settlements	....	....	....	436	477	1,280	92,444	....	122	2,711	97,034
Dutch East Indies	3,418	1	$3	1	2	425	43,495	800	11,311	3,786	63,240
French East Indies	2,188	......	....	....	....	....	....	....	....	....	2,188
Hongkong	551	....	....	....	....	894	599	....	....	489	2,533
Japan	47,241	2,031	4,494	64,130	71,098	358	15,547	....	902	7,544	147,184
Persia	....	....	....	....	....	....	400	....	....	....	400
Russia in Asia	1,770	....	....	399	873	5,721	1,551	....	....	5,815	15,730
Siam	38	....	....	1	2	71	....	....	....	122	233
Turkey in Asia	....	223	669	3,375	1,744	81	2,826	....	....	547	5,867
Totals, Asia	$78,945	2,255	$5,166	68,353	$74,215	$11,026	$223,967	$998	$55,834	$28,682	$478,833
Oceania:											
Australia	$17,598	....	....	702	$806	$1,805	$98,904	$7,030	$3,006	$11,269	$140,418
New Zealand	10,695	..	......	1,154	1,881	129	62,134	638	1,015	9,089	85,581
Other British Oceania	1,200	....	....	122	225	....	1,402	....	.....	1	2,828
French Oceania	99	....	....	152	218	......	....	215	28	227	787
German Oceania	....	1	$6	....	....	....	412	....	.....	....	418
Philippine Islands	14,800	...	......	4,942	4,846	1,333	57,832	3,102	7,250	18,617	107,780
Totals, Oceania	$44,392	1	$6	7,072	$7,976	$3,267	$220,684	$10,985	$11,299	$39,203	$337,812
Africa:											
British West Africa	.....	....	....	52	$125	$262	$27,461	....	......	$154	$28,002
British South Africa	$8,140	48	$205	5,805	4,006	701	18,220	$2,705	$7,050	4,540	45,567
British East Africa	.....	....	....	....	....	....	247	....	....	....	247
Canary Islands	....	....	....	....	....	....	176	7	......	....	183
French Africa	1,500	....	....	....	....	......	4,380	....	......	....	5,880
Portuguese Africa	847	......	....	....	....	13	....	59	....	1,806	2,725
Egypt	675	......	....	1,003	860	....	634	....	655	1	2,825
Totals, Africa	$11,162	48	$205	6,860	$4,991	$976	$51,118	$2,771	$7,705	$6,501	$85,429
Totals	$518,715	21,591	$63,205	1,028,373	$774,843	$108,169	$2,438,958	$104,692	$535,746	$773,052	$5,317,380

SHIPMENTS TO NON-CONTIGUOUS TERRITORY.

Exported to—	Belting Hose and Packing.	Boots and Shoes. Pairs.	Boots and Shoes. Value.	Druggists' Rubber Sundries. Value	Tires. Automobile. Value.	Tires. All Others. Value.	Insulated Wire and Cables. Value.	All Other Manufactures of Rubber. Value.	Totals. Value.
Hawaii	$20,167	....	....	....	$138,314	$5,423	....	$15,895	$179,799
Porto Rico	5,408	....	....	....	47,752	2,413	....	17,044	70,617
Totals	$25,575	....	....	....	$184,066	$7,836	....	$32,939	$250,416

(Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.)

UNITED STATES CRUDE RUBBER IMPORTS FOR 1919 (BY MONTHS).

1919.	Plantations.	Paras.	Africans.	Centrals.	Guayule.	Maniçoba and Matto Grosso.	Totals for 1919.	Totals for 1918.
January ....*tons*	4,906	2,141	2	114	72	...	7,235	16,084
February	14,079	2,701	489	100	87	...	17,456	13,108
March	23,680	3,808	337	211	187	...	28,223	17,161
April	24,678	2,794	90	144	330	110	28,146	13,425
May	14,856	772	389	97	234	...	16,348	16,288
June	13,645	1,706	264	263	390	51	16,319	24,124
July	17,645	121	16	82	101	...	17,965	16,092
August	8,221	2,594	137	74	41	...	11,067	10,421
September	10,143	3,423	312	51	11	96	14,036	5,353
October	25,483	2,590	508	108	25	174	28,888	9,509
November	13,049	2,230	351	44	...	...	15,674	3,363
December	21,885	2,178	445	135	23	9	24,675	11,292
Totals	192,270	27,058	3,340	1,423	1,551	442	226,032	156,220

(Compiled by The Rubber Association of America, Inc.)

RUBBER STATISTICS FOR ITALY.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	Seven Months Ended July 31. 1918. Quintals.[1]	1918. Lire[2].	1919. Quintals.	1919. Lire.
UNMANUFACTURED—				
India rubber and gutta percha—raw and reclaimed:				
From Great Britain	4,279	......	......	......
India and Ceylon	5,217	......	18,101	......
Straits Settlements	17,949	......	32,802	......
French African Colonies	4,214	......	2,620	......
Belgian Congo	132	......	574	......
Brazil	8,895	......	22,425	......
Other countries	1,273	......	1,013	......
Totals	41,959	44,056,950	77,535	81,411,750
Rubber scrap	889	160,020	13,576	2,443,680
MANUFACTURED—				
India rubber and gutta percha—				
Threads	380	998,000	156	405,600
Sheets, including hard rubber	62	100,100	98	161,600
Tubes:				
Inner tubes	4	10,400	2	5,200
Hose	70	91,000	107	139,100
Other forms	1	1,200	19	22,800
Belting	358	501,200	284	397,600
Rubber-coated fabrics—*pieces*:				
For carding combs	117	187,200	290	464,000
Other forms	3	4,500	59	88,500
Boots and shoes—......*pairs*	23,368	350,520	13,068	196,020
Elastic webbing	111	310,800	247	691,600
Clothing and articles for travel	1[illegible]	48,000	2	6,400
Manufactures of rubber and gutta percha, n. e. s.:				
Tires and tubes:				
From France	1,448		3,114	
Great Britain	443	4,538,400	491	8,659,200
Other countries	......		3	
Other rubber manufactures:				
From France	1,294		99	
Great Britain	1,019	3,661,500	7,818	11,911,500
United States	126		23	
Other countries	2		1	
Totals, manufactured	......	12,324,820	......	26,979,720
Totals, imported	......	56,531,790	......	110,835,150

EXPORTS OF CRUDE AND MANUFACTURED RUBBER.

	Seven Months Ended July 31. 1918. Quintals.[1]	1918. Lire[2].	1919. Quintals.	1919. Lire.
UNMANUFACTURED—				
India rubber and gutta percha—raw and reclaimed:				
To Spain	801	......	1,985	......
United States	115	......	1,371	......
Totals	916	366,400	3,356	1,342,400
Rubber scrap	......	......	152,640	152,640
MANUFACTURED—				
India rubber and gutta percha—				
Threads	18	48,600	263	710,100
Sheets:				
Cut sheets	7	16,800	28	67,200
Elastic fabric	21	25,200	12	14,400
Other kinds, including hard rubber	20	30,000	19	28,500
MANUFACTURED—				
Tubes:				
Inner tubes	3	7,800	43	111,800
Hose	86	103,200	286	343,200
Other forms	65	71,500	207	227,700
Belting	36	57,600	95	152,000
Rubber-coated fabrics.—*pieces*	38	45,600	148	177,600
Elastic webbing	544	1,632,000	414	1,242,000
Clothing and articles for travel	3	14,400	9	43,200
Manufactures of india rubber and gutta percha, n. e. s.:				
From cut sheets	45	117,000	64	166,400
Elastic fabrics	66	105,600	109	174,400
Tires and tubes:				
To France	2,249		283	
Great Britain	1,108		1,644	
Spain	81		278	
Switzerland	......		15	
British India and Ceylon	......		545	
Dutch East Indies	441	8,665,900	......	12,179,000
Straits Settlements	......		140	
Australia	......		242	
Argentina	4		636	
Brazil	434		462	
Other countries	244		2,165	
Other rubber manufactures:				
To France	91		199	
Great Britain	87		89	
Spain	7		8	
Switzerland	109		76	
Egypt	21	618,800	29	1,283,800
Argentina	31		132	
Brazil	17		25	
Uruguay	8		11	
Other countries	71		357	
Totals manufactured	......	11,560,000	......	16,921,300
Total exports	......	11,926,400	......	18,416,340

[1] One quintal equals 220.46 pounds.
[2] One lire equals $0.193.

UNITED KINGDOM RUBBER STATISTICS.

IMPORTS.

	November. 1918. Pounds.	1918. Value.	1919. Pounds.	1919. Value.
UNMANUFACTURED—				
Crude rubber:				
From—				
Dutch East Indies	356,600	£41,433	2,269,300	£231,909
French West Africa	13,600	1,621	20,000	2,200
Gold Coast	81,400	4,805	52,800	6,036
Other African countries	244,900	18,512	60,300	5,225
Peru	....	....	180,900	19,240
Brazil	770,500	107,240	724,000	82,517
British India	250,700	31,527	327,700	38,049
Straits Settlements and dependencies, including Labuan	3,434,000	402,775	4,270,100	514,335
Federated Malay States	1,681,400	201,328	3,353,900	355,463
Ceylon and dependencies	1,015,500	116,872	2,923,600	314,032
Other countries	856,500	101,589	214,200	24,543
Totals	8,705,100	1,027,702	4,396,800	1,593,540
Waste and reclaimed rubber	8,720,000	1,028,225	15,024,200	1,612,738
Gutta percha	1,244,100	236,534	1,068,700	194,484
MANUFACTURED—				
Boots and shoes..*dozen pairs*	2,612	24,327	19,074	40,001
Waterproof clothing	....	6,561	....	3,955
Automobile tires and tubes	....	85,528	....	206,180
Bicycle tires and tubes	....	....	....	11,822
Motorcycle tires and tubes	....	99	....	3,789
Insulated wire	....	25	....	2,598
Totals, manufactured	....	116,540	....	268,345

EXPORTS.

	1918. Pounds.	1918. Value.	1919. Pounds.	1919. Value.
UNMANUFACTURED—				
Waste and reclaimed rubber	400,500	£15,228	959,300	£26,535
MANUFACTURED—				
Boots and shoes..*dozen pairs*	5,801	7,799	11,194	27,498
Waterproofed clothing	....	43,977	....	296,195
Automobile tires and tubes	....	83,906	....	245,471
Motorcycle tires and tubes	....	7,270	....	23,410
Bicycle tires and tubes	....	16,357	....	125,205
Carriage tires and tubes	....	13,561	....	22,598
Insulated wire	....	8,315	....	95,201
Submarine cables	....	24,938	....	50,399
Other rubber manufactures	....	126,951	....	298,334
Totals	....	£348,302	....	£1,210,846

UNITED KINGDOM RUBBER STATISTICS—(Continued)
EXPORTS—COLONIAL AND FOREIGN.

	November.			
	1918.		1919.	
UNMANUFACTURED—	Pounds.	Value.	Pounds.	Value.
Crude rubber:				
To Belgium	....	..	584,900	£61,856
France	1,492,900	£167,740	1,755,900	183,108
Italy	218,000	34,379	191,900	16,063
Russia	....	....	5,600	420
United States	....	....	10,127,500	1,088,897
Other countries	208,300	25,858	2,629,900	284,706
Totals	2,019,200	£227,977	15,295,700	£1,635,050
Waste and reclaimed rubber	22,400	900	220,800	7,856
Totals, unmanufactured	2,041,600	£228,877	15,516,500	£1,642,906
Gutta percha	29,100	5,921	164,900	33,610
MANUFACTURED—				
Boots and shoes...*dozen pairs*	....	....	254	£533
Waterproofed clothing	....	....	....	305
Carriage tires	....	....	....	17
Automobile tires and tubes	....	73	....	5,435
Motorcycle tires and tubes	....	....	....	147
Bicycle tires and tubes	....	81	....	417
Insulated wire	....	500	....	....
Totals	....	£654	....	£6,854

RUBBER STATISTICS FOR THE DOMINION OF CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	October.			
	1918.		1919.	
UNMANUFACTURED—*free:*	Pounds.	Value.	Pounds.	Value.
Rubber, gutta percha, etc.:				
From United Kingdom	118,400	$24,520	216,478	$98,600
United States	196,269	92,366	536,077	238,737
Brazil	40,000	14,000	....	....
British East Indies:				
Straits Settlements	1,408,723	427,316	986,643	494,315
Dutch East Indies	......	....	114	57
New Zealand	12,779	9,188	....	....
Other countries	1,150	672	....	....
Totals	1,777,321	$568,062	1,739,312	$831,709
Rubber recovered	301,204	52,140	333,677	51,989
Hard rubber, sheets and rods	2,074	1,479	2,379	1,980
Hard rubber tubes	....	1,067	....	3,598
Rubber, powdered, and rubber or gutta percha scrap	164,654	27,221	300,819	28,897
Rubber thread, not covered	7,223	9,225	7,379	10,644
Rubber substitute	76,303	9,222	209,402	23,728
Totals, unmanufactured	2,328,779	$668,416	2,592,968	$952,545
Chicle	38,108	22,989	245,425	180,935
MANUFACTURED—*dutiable:*				
Boots and shoes	......	$9,966	......	$29,499
Waterproofed clothing	....	6,739	....	13,700
Belting, hose and packing	....	33,404	....	36,459
Gloves and hot-water bottles	....	(*)	....	4,228
Fountain pens	......	(†)	....	2,314
Tires	....	54,082	....	84,736
Insulated wire and cables:				
Wire and cables, covered with cotton, linen, silk, rubber, etc.	....	10,221	....	14,331
Copperwire and cables, covered as above	....	(‡)	....	11,306
Other manufactures	......	163,425	......	188,926
Totals, manufactured	......	$277,837	......	$385,479

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	October.			
	1918.		1919.	
UNMANUFACTURED—	Produce of Canada.	Reexports of Foreign Goods.	Produce of Canada.	Reexports of Foreign Goods.
Crude and waste rubber	7,764	....	$46,352	$15,601
MANUFACTURED—				
Belting	....	....	$3,204	....
Hose	$12,388	....	29,730	....
Boots and shoes	195,146	$204	167,820	....
Clothing	1,889	3,412	5,150	440
Tires	278,254	3,701	520,514	5,607
All other—n. o. p.	5,409	154,948	27,677	1,672
Totals, manufactured	$493,086	$162,265	$754,095	$7,719
Chicle	$25,314	....	$108,890	....

*Included in "Other manufactures."
†Included in "Pens of all kinds."
‡Included in "Wire and cables," etc

THE MARKET FOR RUBBER SCRAP.

NEW YORK.

THE RUBBER SCRAP MARKET has not emerged from the dull state which has characterized it for several months back. Reclaimers have purchased shoe scrap in fair volume at a steady rate. The demand for tires has been mainly confined to stock suitable for rebuilding purposes. The outlet, however, has not been sufficient to prevent the accumulation of a large supply of scrap tires. This situation does not create a pessimistic feeling with the scrap dealers, who look with confidence to the spring demand from the reclaimers.

The heavy snowfalls during the middle weeks of January which were general over the North from the Middle West eastward, have tended to an increased offering of scrap shoes due to the conviction that a sufficient extra crop will result in the spring.

The scrap market is described as soft and prices have recently dropped in sympathy with a decline in crude rubber.

Quotations on shoes are firm, and in general more offerings of scrap are noted.

QUOTATIONS FOR CARLOAD LOTS DELIVERED.

JANUARY 26, 1920.

Prices subject to change without notice.

BOOTS AND SHOES:			
Arctic tops	*lb.*	$0.01 @	
Boots and shoes	*lb.*	.08⅛ @	.08½
Trimmed arctics	*lb.*	.06½ @	.06⅝
Untrimmed arctis	*lb.*	.05⅝ @	
HARD RUBBER:			
Battery jars, black compound	*lb.*	.01 @	
No. 1, bright fracture	*lb.*	.23 @	.24
INNER TUBES:			
No. 1, old packing	*lb.*	.18 @	.18½
No. 2	*lb.*	.10 @	.10¼
Red	*lb.*	.09½ @	.09¾
MECHANICALS:			
Black scrap, mixed, No. 1	*lb.*	.03½ @	.04
No. 2	*lb.*	.03 @	
Car springs	*lb.*	.03½ @	.04
Heels	*lb.*	.03 @	.03½
Horse-shoe pads	*lb.*	.03 @	.03½
Hose, air brake	*lb.*	.04¼ @	
fire, cotton lined	*lb.*	.01½ @	.01¾
garden	*lb.*	.01½ @	.01¾
Insulated wire stripping, free from fiber	*lb.*	.03½ @	.04
Matting	*lb.*	.01¼ @	.01½
Red packing	*lb.*	.05½ @	.06
Red scrap, No. 1	*lb.*	.09 @	.10
No. 2	*lb.*	.06¾ @	.07¼
White scrap No. 2	*lb.*	.08 @	.09
No. 1	*lb.*	.10 @	.11
TIRES:			
PNEUMATIC—			
Auto peelings, No. 1	*lb.*	.06¾ @	.07¾
No. 2	*lb.*	.04¾ @	.05¼
Bicycle	*lb.*	.02¾ @	.03
Standard white auto	*lb.*	.03½ @	.03⅝
Standard mixed auto	*lb.*	.03¾ @	
Stripped, unguaranteed	*lb.*	.02¾ @	
White, G. & G., M. & W., and U. S	*lb.*	.04¾ @	.05
SOLID—			
Carriage	*lb.*	.04 @	.04¼
Irony	*lb.*	.01 @	
Truck	*lb.*	.03½ @	.03¾

THE MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

AMERICAN COTTON. Save for a slight flurry in the third week of January, the cotton market remained extraordinarily steady and dull throughout the month as it was in the last half of December, with a daily record of no sales. On January 2 the spot price for middling uplands cotton was 39.25 cents; that price continued unchanged till January 20, save for a slight drop on one day, when it rose to 39.75 cents, sinking to 38.75 cents two days later, and gettng back again to 39.25 on January 26.

EGYPTIAN COTTON. The Egyptian crop is very nearly sold and as the demand still continues from England and the Continent the market has been pushed up until today good grades of Sakel are worth about $1.25 per pound. There are some lots of Uppers in Egypt around $1.20, but desirable cottons are scarce.

ARIZONA COTTON. This year's crop has now been practically sold but a few low-grade lots can still be purchased at around 90 cents.

SEA ISLAND COTTON. The crop is fairly well cleaned up and average extra choice is quoted at 88 to 90 cents. Crops of all extra staples have proved shorter than anticipated.

DUCKS AND DRILLS. With mills working full time, even though that time has been shortened in many states, it is impossible to meet the overwhelming demand for these goods. The mills are sold up for this year to August, and buyers would be willing to contract for goods for the end of the year if the mills would sell. There is no signs yet of a return to normal conditions. The call for goods needed in the rubber business is especially strong.

RAINCOAT CLOTH. Prices have considerably advanced since last month, but during the past week gray goods have declined about one cent per yard on grades used in the raincoat trade.

TIRE FABRICS. The conditions reported in December continue in January; manufacturers are trying hard to fulfil their contracts, the mills are working overtime and still it is impossible to supply the demand because there is no prospect of being able to deliver the goods.

NEW YORK QUOTATIONS.

JANUARY 26, 1920.

Prices subject to change without notice.

ASBESTOS CLOTH:				
Brake lining, 2½ lbs. sq. yd., brass or copper insertion	*lb.*	$1.00	@	1.10
2¼ lbs. sq. yd., brass or copper insertion	*lb.*	1.10	@	1.15
BURLAPS:				
32—7-ounce	100 *yards*	10.75	@	
32—8-ounce		11.25	@	
40—7½-ounce		12.25	@	
40—8-ounce		12.50	@	
40—10-ounce		17.25	@	
40—10½-ounce		17.50	@	
45—7½-ounce		15.00	@	
45—8-ounce		15.50	@	
48—10-ounce		22.50	@	
DRILLS:				
38-inch 2.00-yard	*yard*	.42½	@	
40-inch 2.47-yard		.34⅞	@	
52-inch 1.90-yard		.65⅛	@	
52-inch 1.95-yard		.64⅛	@	
60-inch 1.52-yard		.82¼	@	
DUCK:				
CARRIAGE CLOTH:				
38-inch 2.00-yard enameling duck	*yard*	.46	@	
38-inch 1.74-yard		.52⅜	@	
72-inch 16.66-ounce		1.19⅝	@	
72-inch 17.21-ounce		1.23⅝	@	
MECHANICAL:				
Hose	*pound*	.76	@	
Belting		.76	@	
HOLLANDS, 40-INCH:				
Acme	*yard*		@	
Endurance			@	
Penn			@	
OSNABURGS:				
40-inch 2.35-yard	*yard*	.37½	@	
40-inch 2.48-yard		.35½	@	
37½-inch 2.42-yard		.36⅜	@	
RAINCOAT FABRICS:				
COTTON:				
Bombazine 64 x 60	*yard*	.29	@	
60 x 48		.26½	@	
Cashmeres, cotton and wool, 36-inch, tan		1.20	@	
Twills 64 x 72		.46	@	
64 x 102		.48	@	
Twill, mercerized, 36-inch, blue and black		.67½	@	
tan and olive		.65	@	
Tweed		.90	@	1.00
printed		.27½	@	
Plaids 60 x 48		.27	@	
56 x 44		.26	@	
Repp		.45	@	.50
Surface prints 60 x 48		.28	@	
64 x 60		.30	@	
IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING—PLAIN AND FANCIES:				
63-inch, 3¼ to 7½ ounces	*yard*	1.45	@	3.90
36-inch, 2¾ to 5 ounces		.85	@	2.25
IMPORTED PLAID LINING (UNION AND COTTON):				
63-inch, 2 to 4 ounces	*yard*	[illegible]	@	1.90
36-inch, 2 to 4 ounces		.60	@	1.15
DOMESTIC WORSTED FABRICS:				
36-inch, 4½ to 8 ounces	*yard*	[illegible]	@	1.90
DOMESTIC WOVEN PLAID LININGS (COTTON):				
36-inch, 3¼ to 5 ounces		.27	@	.35
SHEETINGS, 40-INCH:				
48 x 48, 2.35-yard	*yard*	.40	@	
48 x 48, 2.50-yard		.35	@	
48 x 48, 2.70-yard		.34¼	@	
48 x 48, 2.85-yard		.33	@	
64 x 68, 3.15-yard		[illegible]	@	
56 x 60, 3.60-yard		.31	@	
SILKS:				
Canton, 38-inch	*yard*	.75	@	
Schappe, 36-inch		1.00	@	
STOCKINETTES:				
SINGLE THREAD:				
3½ Peeler, carded	*pound*	—	@	—
4½ Peeler, carded		[illegible]	@	1.15¾
6½ Peeler, combed		—	@	—
DOUBLE THREAD:				
Zero Peeler, carded	*pound*	[illegible]	@	.98½
3½ Peeler, carded		1.04	@	1.04½
6½ Peeler, combed		2.70¼	@	2.70½
TIRE FABRICS:				
BUILDING:				
17¼-ounce Sea Island, combed	*pound*	2.25	@	
17¼-ounce Egyptian, combed		2.00	@	
17¼-ounce Egyptian, carded		1.80	@	
17¼-ounce Peelers, combed		2.25	@	
17¼-ounce Peelers, carded		1.30	@	
CHAFER:				
9¼-ounce Sea Island	*pound*	2.75	@	
9¼-ounce Egyptian, carded		2.25	@	
9¼-ounce Peeler, carded		1.40	@	

HIGH AND LOW POUND QUOTATIONS ON 17¼-OUNCE TIRE BUILDING FABRICS FOR 1919, BY MONTHS.

	Sea Island.		Sakellarides.		Combed Egyptian.		Combed Peeler.		Carded Peeler.	
	High.	Low.	High.	Low.	High.	Low.	High.	Low.	High.	Low.
January	1.50	1.45	1.45	1.40	1.20	1.20	1.05	1.05	.89	.83
February	1.50	1.35	1.40	1.31	1.20	1.20	1.05	1.00	.85	.75
March	1.35	1.30	1.31	1.27	1.20	1.16	1.00	.95	.78	.75
April	1.31	1.27	1.27	1.25	1.15	1.12	1.00	.97	.78	.74
May	1.40	1.30	1.35	1.27	1.22	1.13	1.10	1.00	.80	.75
June	1.45	1.40	1.40	1.35	1.20	1.19	1.20	1.10	.95	.85
July	1.50	1.45	1.42	1.38	1.25	1.20	1.21	1.18	1.00	.95
August	1.60	1.55	1.55	1.45	1.30	1.30	1.30	1.25	1.05	1.00
September	1.60	1.60	1.55	1.55	1.38	1.30	1.33	1.30	1.00	1.00
October	1.85	1.60	1.81	1.55	1.65	1.37	1.65	1.37	1.20	1.00
November	2.00	1.90	2.00	1.80	1.90	1.68	1.90	1.65	1.30	1.20
December	2.35	2.05	2.35	2.00	2.20	1.85	2.15	1.85	1.45	1.30

EGYPTIAN COTTON CROP MOVEMENT.

From August 1, 1919, to November 26, 1919.

	1919-1920.	1918-1919.	1917-1918.
To Liverpool ....bales	135,718	78,113	71,741
Manchester	63,495	38,734	20,738
Other United Kingdom ports	145	5,537	....
Total shipments to Great Britain	199,358	122,384	92,479
To France	14,460	702	10,309
Spain	4,507	10,140	1,484
Italy	7,644	17,270	12,272
Belgium	230	....	....
Switzerland	5,218	3,116	....
Holland	130	....	....
Portugal	250	....	....
Austria	1,917	....	....
Greece	87	3,213	....
Turkey and other countries	73	....	....
Total shipments to Continent	34,516	34,441	24,065
To United States	75,037	11,792	13,530
Japan	6,545	5,411	9,914
Total shipments to all parts	315,456	174,028	139,988
Total crop (interior gross weight), cantars[1]	....	4,826,342	6,315,841

[1]A cantar equals 98 pounds.

(Compiled by Davies, Benachi & Co.)

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

NEW YORK.

The general condition of short supply, on the whole, has not materially changed in most lines. The demand is fully up to the producing capacity for the standard compounding materials, and prices have been advanced in some lines.

The production of lead and zinc in the United States, according to report from governmental sources, experienced a very marked decline in 1919 over the normal output, owing to labor and other controlling conditions.

Aniline Oil. Spot supplies available are offered at 34 to 36 cents per pound.

Barytes. During the first half of the month there were no quotations; later, $23 to $25 per ton was named.

Benzol. There are but small spot stocks available, held at 32 cents per gallon.

Litharge. Production is sold far ahead with demand very active at an advance of ½ cent per pound effective early in the month.

Lithopone. The demand holds very strong, with prices firm at 7¼ to 7½ cents per pound.

Naphtha. Early in the month increasing spot stocks indicated a decline in price by February first. At this date spot is quoted at 32 cents per gallon.

Sublimed Lead. Early in January the price advanced to 8½ to 9 cents, the first increase in a considerable time. The demand exceeds the supply. Later in the month sublimed lead was quoted at 8¾ to 9 cents.

Whiting. The scarcity of chalk imports has lead to an advance in whiting prices which are very firm.

Zinc Oxide. The advance which was expected early in the month proved to be ⅛-cent per pound on all grades. It was attributable to the increased cost of spelter and cooperage.

NEW YORK QUOTATIONS.

January 26, 1920.

Prices subject to change without notice.

ACCELERATORS, ORGANIC.			
Accelerator, N. C. C.	lb.	$0.50 @	
Accelerene, New York	lb.	4.75 @	
Accelemal	lb.	.55 @	.57½
Aldehyde ammonia crystals	lb.	1.28 @	1.38
Aniline oil	lb.	.35 @	
Excellerex	lb.	.65 @	.75
Hexamethylene tetramine (powdered)	lb.	1.28 @	1.38
Paraphenylenediamine	lb.	2.50 @	3.00
Thiocarbanilide	lb.	.55 @	.75
ACCELERATORS, INORGANIC.			
Lead, dry red (bbls.)	lb.	.11¾ @	
sublimed blue (bbls.)	lb.	.09¼ @	
sublimed white (bbls.)	lb.	.09¼ @	
white, basic carbonate (bbls.)	lb.	.10 @	
Lime, flour	lb.	.02¼ @	.02½
Litharge, domestic	lb.	.09¾ @	.10½
sublimed	lb.	.11½ @	
imported	lb.	.11½ @	.12½
Magnesium, carbonate	lb.	.12 @	.16
calcined heavy (Thistle)	lb.	@	
light (Manhattan)	lb.	@	
Magnesium oxide	lb.	.75 @	
commercial	lb.	.23 @	
Magnesite, calcined	ton	50.00 @	65.00
ACIDS.			
Acetic, 28 per cent (bbls.)	lb.	.03 @	
glacial, 99 per cent (carboys)	lb.	.12½ @	
Cresylic (97% straw color) (drums)	gal.	.95 @	
(95% dark) (drums)	gal.	.85 @	
Muriatic, 20 degrees	cwt.	1.75 @	2.00
Nitric, 36 degrees	lb.	.06 @	.06½
Sulphuric, 66 degrees	ton	20.00 @	22.00
ALKALIES.			
Caustic soda, 76 per cent (bbls.)	lb.	.05 @	
Soda ash (bbls.)	lb.	.03½ @	
COLORS.			
Black:			
Bone, powdered	lb.	.07 @	
granulated	lb.	.11 @	
Carbon black (sacks, factory)	lb.	.13 @	
Drop	lb.	.12 @	
Ivory black	lb.	.12 @	
Lampback	lb.	.16 @	
Oil soluble aniline	lb.	1.25 @	
Rubber black	lb.	.08½ @	
Blue:			
Cobalt	lb.	.25 @	.35
Prussian	lb.	.85 @	
Ultramarine	lb.	.18 @	.40
Brown:			
Iron oxide	lb.	.03 @	.03½
Sienna, Italian, raw and burnt	lb.	.05¾ @	.15
Umber, Turkey, raw and burnt	lb.	.05 @	.07½
Vandyke	lb.	.02½ @	.03½
Green:			
Chrome, light	lb.	.37 @	.50
medium	lb.	.40 @	.50
dark	lb.	.50 @	
commercial	lb.	.14 @	
Oxide of chromium (casks)	lb.	.75 @	.90
Red:			
Antimony, crimson, sulphuret of (casks)	lb.	.45 @	.50
crimson, "Mephisto" (casks)	lb.	.60 @	
crimson, "R. M. P."	lb.	.60 @	
Antimony, golden sulphuret of (casks)	lb.	.30 @	.35
golden sulphuret (States)	lb.	*.30 @	
golden, "Mephisto" (casks)	lb.	.33 @	
golden, "R. M. P."	lb.	.33 @	
red sulphuret (States)	lb.	*.25 @	
vermilion sulphuret	lb.	.55 @	
Arsenic, red sulphide	lb.	.18 @	
Indian	lb.	.14 @	
Toluidine toner	lb.	3.75 @	

Iron oxide, reduced grades	lb.	.04½ @ .14
pure bright	lb.	.16 @
Spanish	lb.	.04¼ @ .04¾
Venetian	lb.	.02½ @ .05
Oil soluble aniline, red	lb.	2.00 @
orange	lb.	1.75 @
Oximony	lb.	.18 @
Vermilion, American	lb.	.25 @ .32
artificial	lb.	.35 @
English quicksilver	lb.	1.55 @ 1.65

White:

Aluminum bronze, C. P.	lb.	.51 @
superior	lb.	.55 @
Lithopone, domestic	lb.	.07½ @ .07¾
Ponolith (carloads, factory)	lb.	*.07 @ .07¼
Rubber-makers' white	lb.	.11¼ @
Zinc oxide, Horsehead (less carload, factory):		
"XX red"	lb.	.08⅞ @ .09⅜
"Special"	lb.	.09⅜ @ .09⅞
French process, red seal	lb.	.11¼ @ .11¾
green seal	lb.	.12¼ @ .12¾
white seal	lb.	.13¼ @ .13¾
(States)	lb.	*.08½ @
Azo, ZZZ, lead free (carload factory)	lb.	.08⅞ @ .09⅜
ZZ, under 5% leaded (carload factory)	lb.	.08⅜ @ .08⅝
Z, 8-10% leaded (carload factory)	lb.	.07⅞ @ .08⅛

Yellow:

Cadmium, sulphide, yellow, light, orange	lb.	2.00 @
red	lb.	1.85 @
Chrome, light and medium	lb.	.26 @
Ochre, domestic	lb.	.03 @ .07
imported	lb.	.05½ @ .07½
Oil, soluble aniline	lb.	2.00 @
Zinc chromate	lb.	.40 @

COMPOUNDING INGREDIENTS.

Aluminum flake	ton	@
Ammonia carbonate, powdered	lb.	.17 @ .17½
Asbestine (carloads)	ton	22.50 @ 25.00
Asbestos (bags)	ton	*35.00 @
Avoilas compound	lb.	.33 @
Barium, carbonate, precipitated	ton	80.00 @
sulphide, precipitated	lb.	.07 @
dust	ton	90.00 @
Barytes, pure white	ton	32.50 @ 40.00
Barytes, off color	ton	23.00 @ 25.00
uniform floated	ton	37.50 @ 40.00
Basofor	lb.	.05 @
Blanc fixe	lb.	.04½ @
Bone ash	lb.	.10 @
Chalk, precipitated, extra light	lb.	.05 @ .05½
heavy	lb.	.04 @ .04½
China clay, Dixie	ton	20.00 @
domestic	ton	18.50 @ 20.00
imported	ton	18.00 @ 23.50
Shawnee	ton	18.00 @
Cotton linters, clean mill run, f. o. b. factory	lb.	.04 @
Fossil flour (powdered)	ton	60.00 @
(bolted)	ton	65.00 @
Diatomite	lb.	.02½ @
Glue, high grade	lb.	.30 @ .45
medium	lb.	.20 @ .30
low grade	lb.	.13 @ .20
Graphite, flake (400-pound bbl.)	lb.	.10 @ .30
amorphous	lb.	.04 @ .08
Ground glass FF. (bbls.)	lb.	.03 @
Infusorial earth (powdered)	ton	60.00 @
(bolted)	ton	65.00 @
Liquid rubber	lb.	.17½ @
Mica, powdered	lb.	.08½ @ .09
Pumice stone, powdered (bbl.)	lb.	.05 @
Rotten stone, powdered	lb.	.02½ @ .04½
Rub-R-Glu	lb.	*.20 @ .25
Silex (silica)	ton	22.00 @ 40.00
Starch, powdered corn (carload, bbls.)	cwt.	5.34 @
(carload, bags)	cwt.	5.12 @
Talc, powdered soapstone	ton	22.50 @ 25.00
Tripoli earth, air-floated	ton	50.00 @
Tyre-lith	ton	[illegible] @
Whiting, Alba (carloads)	cwt.	.80 @ .90
Columbia	cwt.	.80 @
commercial	cwt.	1.15 @ 1.20
English cliffstone	cwt.	1.75 @ 2.50
gilders	cwt.	1.35 @
Paris, white, American	cwt.	1.75 @
Quaker	ton	14.00 @
Wood pulp, imported	lb.	.03¾ @
Wood flour, American	lb.	.02 @

MINERAL RUBBER.

Gilsonite	ton	62.50 @ 65.00
Genasco (carloads, factory)	ton	55.00 @
(less carloads, factory)	ton	57.00 @
Hard hydrocarbon	ton	35.00 @
K-X	ton	30.00 @
K. M. R.	ton	50.00 @ 80.00
M. R. X.	ton	100.00 @
Pioneer, carload, factory	ton	*55.00 @
less carload, factory	ton	*57.00 @
Raven M. R.	ton	50.00 @ 70.00
Refined Elaterite	ton	175.00 @
Richmond	ton	75.00 @
No. 64	ton	44.00 @
318/320 M. P. hydrocarbon	ton	50.00 @
Robertson, M. R. Special (carloads, factory)	ton	70.00 @
M. R. (carloads, factory)	ton	55.00 @ 57.50
Walpole rubber flux (factory)	lb.	.05 @

OILS.

Castor, No. 1, U. S. P.	lb.	.20 @
No. 3, U. S. P.	lb.	.19 @
Corn, refined Argo	cwt.	23.56 @
Cotton	lb.	.23 @
Glycerine (98 per cent)	lb.	.27 @ .29
Glycerole	lb.	.55 @
Linseed, raw (carloads)	gal.	1.85 @
Linseed compound	gal.	.85 @
Palm (Niger)	lb.	.17 @
Peanut	lb.	.27 @
Petrolatum	lb.	.07 @
Petroleum grease	lb.	.04¾ @
Pine, steam distilled	gal.	1.45 @
Rapeseed, refined	lb.	.21 @
blown	lb.	.22 @
Rosin	gal.	.95 @
Soya bean	lb.	.19 @
Tar	gal.	.37 @ .43

RESINS AND PITCHES.

Cantella gum	lb.	.55 @
Tar, retort	bbl.	15.00 @ 15.50
kiln	bbl.	15.00 @ 15.50
Pitch, Burgundy	lb.	.09 @
coal tar	bbl.	7.50 @
pine tar	lb.	.04 @
ponto	lb.	.14 @
Rosin	bbl.	None
granulated	lb.	None
fused		None
Rosin, K	bbl.	21.00 @
Shellac, fine orange	lb.	1.65 @ 1.75

SOLVENTS.

Acetone (98.99 per cent drums)	lb.	.16 @
methyl (drums)	gal.	1.15 @
Benzol, water white	gal.	.27 @ .31
Beta-naphthol, resublimed	lb.	1.00 @
ordinary grade	lb.	.55 @
Carbon bisulphide (drums)	lb.	.05½ @ .06¾
tetrachloride (drums)	lb.	11½ @ .13
Naphtha, motor gasoline (steel bbls)	gal.	.26½ @
72 @ 76 degrees (steel bbls.)	gal.	.36½ @
68 @ 70 degrees (steel bbls.)	gal.	.33½ @
V. M. & P. (steel bbls.)	gal.	.25½ @
Toluol, pure	gal.	[illegible] @ .32
Turpentine, spirits	gal.	1.94 @
wood	gal.	1.60 @
Osmaco reducer	gal.	.35 @
Xylol, pure	gal.	.40 @ .45
commercial	gal.	.30 @ .35

SUBSTITUTES.

Black	lb.	.11 @ .22
White	lb.	.11 @ .24
Brown	lb.	.15 @ .23
Brown factice	lb.	.10 @ .22
White factice	lb.	.12 @ .23
Paragol, soft and medium (carloads)	cwt.	18.58 @
hard	cwt.	18.08 @

VULCANIZING INGREDIENTS.

Lead, black hyposulphite (Black Hypo)	lb.	.52 @ .56
Orange mineral, domestic	lb.	.14¾ @
Sulphur chloride (drums)	lb.	.06½ @ .07
Sulphur, flour, Brooklyn brand (carloads)	cwt.	3.15 @
pure soft (carloads)	cwt.	3.40 @
superfine (carloads, factory)	lb.	.02⅝ @
(See also Colors—Antimony.)		

WAXES.

Wax, beeswax, white	lb.	.65 @ .68
ceresin, white	lb.	.16 @ .18
carnauba	lb.	.47 @ .48
ozokerite, black	lb.	.58 @ .60
green	lb.	.87 @ .88
Montan	lb.	.28 @ .30
substitute	lb.	None
paraffine, refined 118/120 m. p. (cases)	lb.	.09½ @
123/125 m. p. (cases)	lb.	.09¾ @
128/130 m. p. (cases)	lb.	.10¾ @

*Nominal.

If properly irrigated, Egypt's area cultivable in cotton, would be 6,976,000 acres, of which in round numbers 3,000,000 acres would be given up to cotton annually, according to present methods, and would yield over 11,000,000 hundred-weight of cotton, according to the present yield per acre.

INDIA RUBBER WORLD
FOUNDED 1889

Vol. 61 FEBRUARY 1, 1920. No. 5

TABLE OF CONTENTS.

Editorials: Pages
- As to Strikes and Unrest 269
- The Rubber Cored Golf Ball 269
- Rubber Machinery Triumphs 269-270
- Cripple Creek Rubber 270
- Rubber Stealing Stopped 270
- Planting for Plastics 270
- Chewing Chicle 270
- Pneumatic vs. Solid Truck Tires 270

The Rubber Association of America, Inc.:
- Twentieth Annual Banquet 271-275
  Illustration of Banquet and Portraits of Speakers.
- Members and Guests Present 275-276
- Annual Meeting, Report of 277-280
- Portraits of Officers and Directors 279
- Divisions Meetings 280

Influence of Present Exchange Situation on Competitive Position of American Rubber Industry in Foreign Fields.
By L. W. Alwyn-Schmidt. Illustrated 281-283

Cotton Bonanza in the Southwest ...... Illustrated 284-285

Inquiries and Trade Opportunities 285

Manufacture of Elastic Fabrics ...... Illustrated 286-288

Motor and Accessory Manufacturers' Association—Meetings and Banquet 288

Chemistry:
- What the Rubber Chemists Are Doing 289-290
  Variability in Plantation Rubber. Effect of Soaking Coagulum in Water. The Cause of Rustiness in Sheet Rubber. Determination of Iron and Aluminum. Inferior Grades of Rubber.
- Chemical Patents 291
- Laboratory Apparatus ...... Illustrated 291

Expansion of Rubber Compounds During Vulcanization ...... By C. W. Sanderson—Charts 292-294

Fountain Pen Ink Sacks ...... Illustrated 294

Selecting Service Managers .... By Adrian B. French 294-295

A Word of Caution Concerning Pneumatic Truck Tires ...... By J. Newton Gunn 295

Machines and Appliances ...... Illustrated 296-298
Motor Driven Tire Testing Machine. High Pressure Tire Retreader. A Combination Tread Roller, Peeler and Applier. Water Bottle and Fountain Syringe Trimming Machine. Standard Cooling and Drying Racks. Coal Handling Conveyors. Inner Tube Patch Buffers. Rubber Thickness Gage. Sandstones for Rubber Workers.

Machinery Patents ...... Illustrated 298
Apparatus for Producing Waterproof Felt. Other Machinery Patents.

Process Patents 298

New Goods and Specialities ...... Illustrated 299-300
Cord Tire with Non-skid Tread. "Hilo" Flexible Varnish for Rubberized Fabrics. A Covering for Portable Electric Cord. A New Bicycle Tire. The "Suction Grip" Ladder Foot. A Convenient Tire Tool. "Vulcanize It." A Black and Gray Cord Tire. Reinforced Pedal Rubber. "Kwikfix" Rubber Cement. Two More Cord Tires. Stanwood Heel Plate. A Rubber Snake. A New Casing Patch. "Firo" Superheat Packing. "Triple Diamond" Rubber Belting. Detachable Heel. Sure Footing on the Running Board.

Interesting Letters from Our Readers 301

New Trade Publications 302

Holiday Greetings, Calendars and Souvenirs 302-303

Obituary Record 303
Theodore Whitney Blake. Frank A. Williams. George Weston. George S. Atwood.

Rubber in Base Balls ...... Illustrated 303

Twentieth Annual National Automobile Show. Illustrated 304

American Rubber Trade—News Notes and Personals 305-318
- Dividends 305
- Financial Notes 305-306
- New Incorporations 307-308
- A. G. Partridge ...... Portrait and Sketch 308
- John W. Thomas ...... Portrait and Sketch 308
- Eastern and Southern Notes 309
- New Jersey .. By Our Correspondent—Illustrated 309-310
- Rhode Island ...... By Our Correspondent 310-311
- Massachusetts By Our Correspondent—Illustrated 311-313
- John T. Johnson ...... Portrait and Sketch 313
- L. McAnaney ...... Portrait and Sketch 313
- Ohio ...... By Our Correspondent—Illustrated 314-315
- Perfection Tire & Rubber Co., The .... Illustrated 316
- Pacific Coast ...... By Our Correspondent 317-318
- Canada 318

Foreign Rubber News:
- Great Britain ...... By Our Correspondent 319-320
- British Key Industries to Be Protected 320

Rubber Planting Notes ...... Illustrated 321

Patents Relating to Rubber 322-323
United States. Canada. United Kingdom. Germany.

Trade Marks 323
United States. Canada.

Designs ...... Illustrated 323-324
United States. Canada.

Judicial Decisions 324

Markets:
- Crude Rubber, Annual Review ...... Chart 325
  - Monthly Review 326
  - Highest and Lowest Prices 326
  - Antwerp Rubber Market 326
  - Batavia Rubber Market 327
  - Singapore Rubber Auctions 327
- Reclaimed Rubber 326
- Rubber Scrap 332
- Cotton and Other Fabrics 332-333
- High and Low Pound Quotations on 17¼-Ounce Tire Building Fabrics for 1919, by months 334
- Chemicals and Ingredients 334-335

Statistics:
- Antwerp Rubber Arrivals 259
- Canada, Statistics for 333
- Cotton—Egyptian Cotton Crop 265-266
- Italy, Statistics for Six Months Ended June 263
- Straits Settlements Rubber Exports 327
- United Kingdom Statistics for October 331-332
- United States:
  - Crude Rubber Arrivals at New York as Stated by Ship's Manifests 327-329
    - At Pacific Ports as Reported 329
    - Imports for 1919 (By Months) 331
  - Exports During November, 1919 (By Countries) 330-331

INDIA RUBBER WORLD

CAOUTCHOUC — HEVEA BRASILIENSIS — FOUNDED 1889 — DICHOPSIS GUTTA — GUTTA-PERCHA

Reg. U. S. Pat. Off. Reg. United Kingdom

Edited by HENRY C. PEARSON

Vol. LXI. No. 6. MARCH 1, 1920 35 CENTS $3.00 Per Year. $3.50 Abroad.

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC GUTTA-PERCHA
Reg. United States Pat. Off. Reg. United Kingdom.

Published on the 1st of each month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.
Telephone—Bryant 2576.
CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, F.R.G.S., Editor

Vol. 61. MARCH 1, 1920. No. 6

SUBSCRIPTION: $3.00 per year, $1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, $3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft. Post Office or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

DISCONTINUANCES: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

TABLE OF CONTENTS ON LAST PAGE OF READING.

GOODYEAR AND THE HALL OF FAME.

CHARLES GOODYEAR discovered, invented, created vulcanized rubber. Thus simply stated, the fact seems very commonplace and of no paramount importance. It does not seem comparable with the work of Whitney and the Cotton Gin, Fulton and the Steamboat, Morse and the Telegraph, and others of the Immortals. Yet his accomplishment as far as originality goes far transcends them all. Not that it is intended to minimize the genius of the others or to decry the value of their work. But the case stands thus: Fulton applied an existing well-known principle successfully; Whitney made a machine do what had formerly been done by hand; Morse interpreted and applied known physical laws in electrical transmission. Goodyear on the other hand had no prepared basic knowledge from which to start: no text books contained a line of value; scientists and practical men could offer no assistance. Indeed, the thought that india rubber could be "changed" was to them the height of absurdity. Yet after thousands of experiments, covering years of time, he transferred a sticky, unreliable vegetable resin into a semi-metal that is to-day one of the world's most useful products. No other single human invention approaches it in strangeness. The transmutation of lead into gold would alone equal it in apparent impossibility.

From his discovery in the early 'forties has sprung an industry that is world-wide in scope. The production of the gum has given work to hundreds of thousands of natives in South America, Africa and Southern India. It has done more to clear up tropical jungles and to bring civilization and sanitation to the hot countries than has any other one industry. The hundreds of factories in the temperate zone, the millions of workmen and the billions of wealth thus created are in themselves a potent witness to the value of the Goodyear discovery.

Fortunately for individual manufacturers but unfortunately as far as general knowledge goes, vulcanization instead of founding one industry, produced nearly a score, all based solely upon vulcanization, but aside from that having little in common. To cite two examples, rubber footwear and insulated wire. They vary widely in machinery, processes, compounds, and markets. Manufacturers of the one commodity may not know that the other exists. And so it is with the rest of the lines of rubber manufacture.

To catalog even the varied products of vulcanized rubber would be an enormous task. Suffice it to say that it is a necessary factor in every industry, touches every profession and indeed every individual.

Hence it is wise and right that the request of Colonel Colt published elsewhere in these columns be endorsed by everyone in the rubber trade, and by every American. Charles Goodyear's name certainly belongs in the Hall of Fame.

AS TO PNEUMATICS FOR TRUCKS.

"AUTOMOTIVE INDUSTRIES" sounded a timely note of warning recently in an article entitled "Pneumatic Figures Needed," thus:

There is great need for authentic figures on pneumatic truck tire costs in different services. The claims made by different manufacturers vary widely. This is natural when it is considered that the figures are compiled from services operating under widely varying circumstances. The time has come, however, when definite conclusions should be drawn.

One manufacturer claims that on a ton-mile basis, the pneumatic will save 25 per cent on gasoline, 32 per cent on oil and 70 per cent on repairs. These figures were deduced from observations of trucks in service in Texas. It would be interesting to know how this checks with experiences in other parts of the country and some more or less concerted effort for getting down to hard facts on the pneumatic tire will be necessary before we have a clearly established idea of where they pay and where their serviceability is problematical.

It is very doubtful if the size of the truck has much to do with the matter, although there is doubtless a limit of truck size for which pneumatics are desirable. It is felt by many truck makers that the 1 to 1½-ton size should be practically universally equipped with pneumatics, and the 3½-ton size and over, rarely, if ever. It

is the sizes in between those from $1\frac{1}{2}$ to $3\frac{1}{2}$ tons capacity, which furnish the ground for debate. It is here that the purchaser must carefully weigh the conditions under which he will operate his trucks and make the decision. To help him reach his decision the manufacturer should equip his sales force with a mass of figures covering all phases of transportation, or the purchaser will be left very much at sea on a most important problem.

Furthermore, the matter is of the utmost importance to the truck manufacturer, because it will affect his design. If a large percentage of the trucks between $1\frac{1}{2}$ and 3 tons capacity will require pneumatics, it is evident that new designs are required immediately, as tire manufacturers and others assert that there are few if any trucks in that capacity range really adapted to pneumatics.

The problem of design of a pneumatic-tired truck is altogether different from that of designing a vehicle for solids. Higher engine speeds and different gear reductions are necessary for these fleet freight carriers which are capable of 30 miles an hour and move across the relatively uninhabited sections of the country. It is with these vehicles that the ship-by-truck movement has been made a reality and considering the characteristics demanded of the truck the design reverts back very closely to passenger car practice in engine speeds and gear ratios.

A true picture of the situation will not be gained until we have complete statistics regarding costs in all the standard lines of transportation in which the trucks in the debatable class, between $1\frac{1}{2}$ and $3\frac{1}{2}$ tons, are used, and until recommendations made on the basis of observations of trucks in operation show what changes are desirable with the pneumatics. The invention of new rim types for the easy removal and replacement of the giant pneumatic, is a big step in rendering the large pneumatic truck more serviceable, but a collection of unbiased cost, speed and efficiency figures is needed to help the bewildered purchaser reach a positive conclusion before he selects his truck.

RUBBER RAINBOWS.

According to statisticians, ninety-nine and eight-tenths of those who own a few dollars are unable to retain them. They are rainbow chasers: gold, copper, oil, rubber, anything that sounds big. Just now it is rubber. New companies are floated overnight, or, a small company gets a letter of this sort:

> "The smaller companies cannot compete with the big ones. Why? Lack of capital. I can dispose of any amount of stock you may have to sell in thirty to ninety days. Please communicate at once," etc., etc.

Accompanying this is a chart headed, "Do you want $423,000 for $1,000," with the following figures:

> Goodrich, original investment of $1,000, is worth $696,000.
>
> Firestone, original investment of $1,000, is worth $150,000.

This of course is for the prospective investor, and it is unfortunately very effective.

Of course it is all true enough, that is, as far as the big companies named are concerned. It, however, does not take into consideration the long years of preparatory work before the original thousand was anything but a loss. No word of warning is given as to the necessity for building a solid foundation for the projected colossus. Nothing is hinted as to the need of experienced and brilliant managers, organizers and financiers. Nor does it enter into the head of the investor that the big boom is over, and from now on it is to be the steady grind of every-day, careful, cheese-paring business, with constantly decreasing profits. Not that the rubber business will not continue to grow and prosper. It will. But mushroom companies, no matter what their capitalization, are almost sure to come to grief, for the promoter is not trying for success, but simply for his commissions.

RUBBER LEADERS ON INDUSTRIAL RELATIONS.

The Industrial Committee of the Merchants' Association of New York of which Frederic G. Achelis of the American Hard Rubber Co., J. Newton Gunn, president of the United States Tire Co., and other rubber men are members, formulates the following excellent advice: "The recognition by both employers and employes that the determination to achieve national prosperity rather than to enforce maximum selfish returns, should be the controlling motive in industry. The community, as such, has a right to insist that industry be carried on in the interest of all citizens rather than for the sole benefit of those directly engaged in it. The permanent welfare of all citizens depends on national prosperity which is impossible unless there is maximum production at minimum 'per unit' cost without impairment either of proper living standards of employes or the ability of the employers to earn a reasonable return on their investment."

It is urged that a permanent method of conference between the employer and his employes be recognized with a definite arrangement—satisfactory to both employers and employes—whereby employes can collectively take up disputes or matters of common interest with employers. The following matters, it is declared, should be handled in such conferences: "Wages and working conditions including steps to promote continuous and permanent employment, especially in the case of introduction of new machinery and new processes; plant conditions affecting health and general welfare of the workers." A fair day's wage and continuous employment are urged as essentials to a harmonious understanding.

The old-time mill settlement was an aggregation of barrack-tenements, squalid half-cottages and big jail-like factories. The factory village of to-day is made up of pleasant houses, gardens, parks, recreation grounds, club houses, hospitals, libraries, and factories where light, comfort, and health are prime requisites. Indeed, a new industrial project to-day begins with homes for the workers. In all of this transformation, the rubber trade has been a pioneer. It is claimed, furthermore, that no industry can show as large a proportion of well-to-do workers who own their homes. This in itself is the best possible insurance against unrest, strikes and soviets.

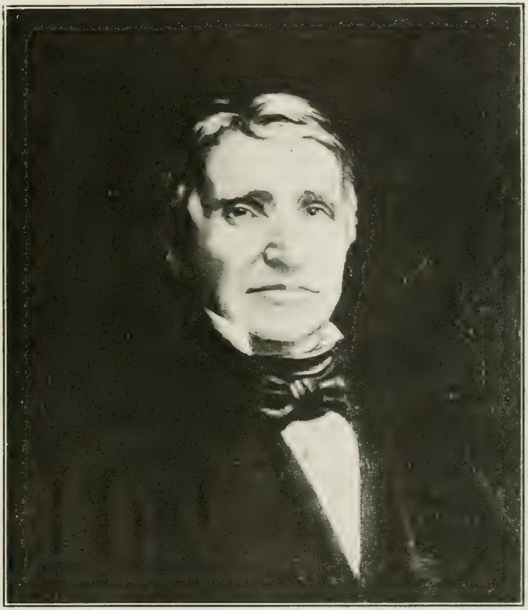
Charles Goodyear Nominated for the Hall of Fame.

An effort to secure a place in the Hall of Fame for Charles Goodyear will be made this year by leading figures in the rubber world. Elections take place every five years and 1920 is one of the years for making selections. Colonel Samuel P. Colt has already inaugurated a movement to bring the qualifications of Charles Goodyear to the attention of the one hundred electors who will vote on candidates, and as a first step, has written a letter of formal nomination to Robert Underwood Johnson, director of the Hall of Fame. In his letter Colonel Colt says:

"I wish to strongly urge the name of Charles Goodyear, the inventor of vulcanization of rubber. When we think of the many uses to which rubber is now put, adding greatly to the comfort of mankind, the alleviation of suffering, and the advancement of civilization, we are impressed with the fact that the world owes Charles Goodyear a debt of gratitude that can never be paid.

"All the improvements in the manufacture of rubber goods in general are based wholly upon Charles Goodyear's discovery of vulcanization — without air-brake hose, railway trains could not be properly run, without rubber tires we could not have automobiles or auto trucks and without rubber appliances we could not have the telephone, electric lights, airplanes nor the thousand and one other things in which rubber plays an important part.

"Of the eight rubber companies originally licensed under the patents of Charles Goodyear, three have gone out of business and the other five are now owned by the United States Rubber Co., which gives us a special interest in the great inventor."



(From an oil portrait.) Charles Goodyear.

The claims of Charles Goodyear have been brought to the attention of electors at past elections in an unostentatious way, but rubber had not attained, even so late as the last election in 1915, the place of importance in American business it holds to-day. In 1914 the total production of rubber goods in the United States amounted to only $320,000,000. In 1918 the output was $1,122,000,000, nearly four times as great.

Goodyear's discovery of the vulcanization process is one of the romances of the history of invention. One of the reasons why he is especially entitled to recognition is that he understood clearly the importance of the results he was seeking to attain, and though by a mere accident he finally discovered the solution of his problem, it was not accidental that it was he who found the solution, for he had devoted his entire energy to the subject for years.

With a prescience that was uncanny, he forecast for rubber a future that even the development of the rubber industry in the past few years has not surpassed. He knew little about the electrical field, it is true, and nothing whatever about automobiles, yet his claims for patents made in the early forties show a vision for the future of rubber that was startlingly clear.

A man of strong religious tendencies, he felt himself under a divine impulse to carry to success experiments which would confer so great a boon on humanity. It was this feeling that led him, in spite of most precarious health and dire poverty, to continue for ten years his search for the elusive secret of how rubber might be made suitable for use.

As his experiments progressed, he not only manufactured rubber goods but even dressed in clothes made of rubber, wearing them for the purpose of testing their durability. He was certainly an odd figure and his appearance led one of his friends, who was asked how Mr. Goodyear might be recognized, to reply: "If you see a man with an india rubber coat on, india rubber shoes, an india rubber cap, and in his pocket an india rubber purse with not a cent in it, that is Goodyear."

His poverty was so extreme that many times only the kindness of friends and neighbors kept his large family from starvation. At that period imprisonment for debt was in vogue and on many occasions Goodyear found himself locked up for debt. He was regarded as a "crazy inventor," and, as time after time his hope that he had finally hit upon a solution of his problem proved illusory, his friends and relatives did not hesitate to tell him with much harshness that he should give up his experiments and find some means of supporting his family. But he persisted until he won complete success and then, instead of settling back and reaping a harvest from his discoveries, continued to spend the money that came to him, in adapting his discoveries to practical uses.

Though born in New Haven, Connecticut, Goodyear spent

much time in New York City and in various towns in Massachusetts. It was in Woburn in the latter state, when some rubber fell accidentally from his hand upon the top of a red hot stove, that he learned that the application of heat was the one additional element needed in the solution of the problem. So intimate was his acquaintance with his subject that the change produced in the rubber by its unexpected contact with the stove was recognized by him as of vital importance.

Large sums of money had been invested and lost in rubber manufacture before Goodyear brought his process to completion. Goods that looked all right were made up, but cold weather made them stiff and brittle, and in summer they became soft, and decomposition gave them an offensive odor.

Goodyear was born December 29, 1800. In 1834 he began his rubber experiments but it was not until the spring of 1839 that the stove incident occurred. His process was not fully perfected until 1844. He received the grand medal of the World's Exhibition at Paris, the Great Council medal of the Exhibition of All Nations at London, and the ribbon of the Legion of Honor from Napoleon III. He died at the old Fifth Avenue Hotel in New York in July, 1860. Death found him insolvent and his family heavily in debt. Though he made no fortune for himself, great wealth has come to many through his invention.

Seeing the Short Cuts.

By A Practical Man.

THERE is not one man in fifty who is either a trained or a natural observer. Moreover, the notion that observation comes naturally, like mastication or perspiration, is far from the truth. Some lack that quality of mind that constitutes the chief asset of the job analyst, while most men look but do not see. A great number are so close to their work that they lose the perspective. This explains in part the fact that the industrial engineer finds plenty of occupation for the ability required in his profession. The instances that follow came under the personal observation of the writer and tell of those who were convinced of a blind spot, and proceeded to cure it, much to their individual benefit and the credit of the rubber fraternity.

CONVEYOR CHUTES SAVE TIME.

A company in the Middle West engaged in the manufacture of bicycle tires employed a truck to gather the packages put up by the packers. This truck was pushed down a long aisle behind the men engaged in this work, where it gathered a load which was carried to the elevator located in the extreme end of the room; thence down one floor to the shipping department. This trucking was eliminated by cutting a hole in the floor about midway in the packing line and installing a chute, which delivered the packed goods by rapid transit.

A manufacturer of fabric shoes in the East, after inspecting the tops as they came from the sewing machines, paired them and placed them in small bags, which were then loaded upon a truck and delivered by the elevator to the next department, which happened to be immediately underneath. Here the bags were opened and the contents distributed. A chute from the inspection table to the floor below would have saved a lot of this work, and given almost instantaneous delivery.

An old and successful Eastern company had its mill room and calender rooms on one side of the lower floor, but with the engine room in between. To supply the calenders with material necessitated frequent trips by truck from the mill room. This trip was an irregular one, winding its way through several departments, by aisles always more or less congested, and by the time a round trip had been made the truck had traveled a distance of 760 feet. This trip was cut down to about 150 feet round-trip in the following way. A window in the mill room nearest the engine room was enlarged into a doorway, and a corresponding change made in the calender room. These two doors, therefore, opened to the outside, and in line with one another. A covered passage was then constructed connecting them, and better and quicker service at once resulted.

Another company had a battery of insulating machines on the second floor immediately over the calenders from which it received the supply of mixed stock. This particular process resulted in the rapid accumulation of large quantities of scrap, which was frequently returned by trucks to the calender room for rewarming, recalendering and return. A load of this scrap left the machines on a trip of 200 feet to the elevator, down the elevator 12 feet, thence to the warmers for the calenders, 200 feet more. This trip of 412 feet was cut out by the simple introduction of a chute from the vicinity of the insulating machines to the warming mills immediately underneath.

A trip of over 1,600 feet for a batch of Pará from the rubber cellar to the mixing mills would seem, with one company at least, a denial that "time is money." But such a situation came under the observation of the writer some years ago. From the point where the rubber was stored to the scales in the compound room where it was weighed, was 678 feet. The round-trip, therefore, for the trucker was 1,356 feet. From the scales to the breaking down mills was 140 feet, and from these mills back over the same track to the band saw where the rubber was cut and weighed into batches, was 140 feet more Here it connected with the prepared compound and took a final trip of 50 feet to the mixers. It is a singular fact that directly under the compound room there was a cellar that could have been adapted to rubber storage and cut the initial round trip from 1,356 to less than 50 feet.

WORN MACHINERY A HINDRANCE.

Manufacturers of shoes find a machine for inserting eyelets a necessity. These machines are ingenious and complicated in the arrangement of parts. They are designed to insert any number of eyelets consecutively, the standard ranging from 4 to 11. The operator must have a thorough knowledge of the machine and the requirements in eyelets for each style and size of shoe. These eyelets must be so placed as to start at a point determined by the eye and be equally spaced over the limited surface allowed for the purpose. This spacing is designed to be controlled by a movable steel pin which engages in holes in a disk on which are stamped figures, ¼, ½, ¾, 1, etc. The pin inserted in any one of these should adjust the mechanism so that eyelets would be spaced the indicated distance apart. It chanced, however, in one factory, that none of the machines studied would perform the work according to specifications. The operators knew of no rule to govern the spacing and frequently lost time in trying to secure it. Conversation with the man who looked after these machines revealed the cause to be a worn out cam, which prevented proper alinement of the eyelets. The insertion of a new cam made the use of the pin and disk dependable.

UTILIZING SPACE.

A company engaged in the manufacture of mechanical goods had a commodious, well-lighted room around the sides of which 4-platen hydraulic presses were located. The center of this space, 15 by 20 feet, was occupied by stock and tables on which were placed the vulcanized articles consisting largely of valves, heels, horse-shoe pads, etc. For years these had been gathered

in box trucks and toted to an adjoining room 75 feet distant, where they were trimmed by girls and inspected. This toting was obviously waste motion and was corrected by building in front of the battery of presses, benches arranged in the form of a square, the interior of which was immediately occupied by the trimmers and their equipment.

SYSTEM IN MILLING RUBBER.

There is a variety of practice in breaking down rubber and mixing compounds. In some lines of manufacture five or six hours is not regarded as excessive to break down Pará, while in other very divergent methods, considerably less than one hour is considered sufficient. Then, apparently of necessity, some compounded batches require a much longer time for mixing than others. Time on the mill is often a point in dispute, and there should be some intelligent method to control it. If you are convinced that the same mill should be used for warming up rubber and mixing, the chances are you are not very keen over a few extra minutes that may be taken by workmen who are not controlled by written standard practice.

A very satisfactory method will be followed in the use of two mills by one man who warms up gum on one while mixing a batch on the other. A mill, say 16 by 42, with a speed of 14 and 18 r.p.m. can mix a compounded batch of 100 to 125 pounds in five or six minutes. This would necessitate, probably, a mill equipped with a mixing apron, for the value of such an attachment can be easily demonstrated. Under this method, five or six minutes is sufficient time to incorporate the compound in the rubber, and the batch should be immediately cut off the mill. This commonplace act of cutting-off can be made a time-waster, for the number of cuts should be a matter of standard. For example, one stroke of the knife across the face of the roll and the batch drops from the mill—a matter of seconds—but the average mill hand will take off a batch of this size in six or more cuts. In many cases batches go from the mixer to the refiner, or ready for the cooling shelves. In either case, the batch should not be rolled up as it is cut from the mill, but should be handled in slab form, the point of value being to get the finished batch off and a new one on, with the fewest motions possible. It is clear that the operations of refining and warming up are really continuations of the process of mixing, hence saving time on rough mixing is good practice.

A SECOND FLOOR FOR STORAGE.

In many rubber factories the compounding room has a minimum of equipment and maximum of discomfort, and good ventilation is not one of its virtues. As a rule, it is on the main factory floor near the mill room and looks like Satan's back yard. Materials are handled in the original package and the space is cluttered with boxes, barrels, casks, carboys and bags. Labor-saving devices get paralysis before crossing the threshold, and the superintendent who is indifferent to such a condition must have a well-developed blind spot. Taking into account the real efficiency of the average man when provided with proper equipment to handle a job, it is singular that anyone should apparently fail to see the waste of time when a man has to dig up things out of barrels and casks, the work steadily taking longer and becoming physically harder the deeper he goes into a container that must of necessity be emptied. Just because this material is in bulk and heavy is no reason why it should not be handled efficiently. There is at least one way in which this can be done, namely, to introduce the use of chutes or conveyors. This means a second floor for storage of compounds, and extending to the floor below, a chute for each ingredient, whence the quantities required can be drawn and weighed. With storage room equipped for handling bulk packages by power, the filling of chutes, which should have capacity from a barrel to a ton, would be a simple matter. If any compounds require drying or sifting, apparatus for this purpose should be provided on the second floor. This method accomplishes two things. It clears the air on the main floor of dust and permits weighing of materials with rapidity. Where, under the old way, "comp" had to be laboriously shoveled from barrels and taken to the scale, in the new way the scale and weighing hopper, moved on a track are run underneath the chutes which are opened as required.

EXPERT WORKERS.

Industrial engineers have always advocated training a workman so that he could perform his task in the most efficient way. This is not always done, with the inevitable result of lowering the quality of performance throughout the shop. The best factories are those that maintain a high standard of excellence, and if a man wishes permanent employment he is compelled to answer affirmatively the question, "Are you a high-class man?" There are some machines used in rubber manufacture that call for a high degree of skill. Those used for cutting out soles for footwear are in this class. It is an easy machine to operate, a light pressure and removal of the foot starting and stopping it. But the job calls for a nice adjustment of the man to the machine, a sort of nervo-physical balance. It is one thing to have a man operate this machine as though he were shoving pig-iron into a furnace, and another to have a man who has a hair-trigger control of every muscle and pushes the rubber slab and cut soles in rhythmic sequence with the rhythm of the machine. The results are readily discernible. The man who thinks of pig-iron when handling a rubber slab across the cutting plate and tries to break through the floor when he presses the treadle cuts 1,800 to 2,500 soles; the other type of man 3,500 to 5,000. Take each of these men at his minimum as an average and you have for 30 days 54,000 and 105,000 respectively.

One way to make a man an expert workman is to impress him with the importance of maximum production. If he is operating a sole-cutting machine and he has to stop it to sharpen a knife or adjust an ill-fitting part or to get stock or wait for his helper, he will soon get a wrong slant at the main idea. It is a losing proposition that works both ways.

THE FOREMAN SHOULD BE CENTRALLY LOCATED.

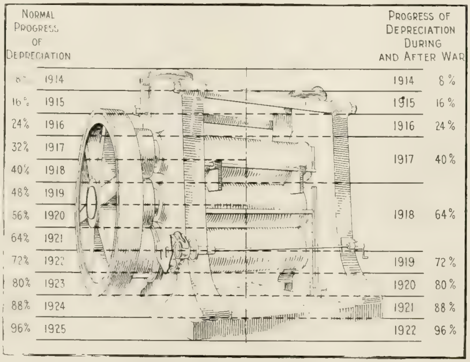
In the layout and equipment of a factory department the location of the foreman's office, as a rule, receives scant attention, with the result that it is frequently located at one end of the room farthest removed from the larger number of workmen. In one case, in the milling department of a rubber factory, one corner of the room was used for putting up compounding materials. This room was walled in to prevent the spread of dust and a portion of it, a space 3 by 10 feet against a window, was used by the foreman as his office for the clerical work he had to do. There were in this department 40 mixing mills, a calender, four washers and large drying rooms, so it was sizable enough to require constant supervision. The point I wish to make is, that the foreman's office or desk should be so located that his men will be under his eye at all times. When this principle was emphasized to the superintendent of the mill in question, his eyes were opened to the desirability of having a change made. Opening out of the mill room about midway in its length was a small store room. A section of the wall between was removed and windows substituted in the form of a bay projecting slightly into the mill room. The floor of the new office was placed three feet above the mill room level, and from this point of vantage all operations were under constant observation.

This same factory had its vulcanizers on the ground floor. The bulk of its product was produced on the second floor and had to be lowered by an elevator for curing, and hoisted afterward for inspecting and finishing. This extravagant waste of time and travel had been going on for years, the management being apparently "stone blind" to the loss incurred. A new superintendent caused the vulcanizers to be raised to the level of the second floor.

The Rapid Rise in the Cost of Equipment—An Important Factor in Rubber Production Cost Accounting.

By L. W. Alwyn-Schmidt, Consulting Economist.

The recent increases in the cost of all industrial equipment is bound to play an important part in the cost accounting policies of our rubber factories during the present year, and others to come. There is hardly a unit of equipment that has not been touched by this rise. Industrial machinery has gone up at the rate of one to two hundred per cent, building expenditures are up at least 150 per cent, and the great range of industrial supplementary equipment, part of which is a product of the rubber industry as belting, has seen advances of at least 100 per cent during the last few years. These advances in the cost of equipment, although well known to all manufacturers in the rubber industry, nevertheless seem not to have made a permanent impression upon the minds of the financial experts of this industry. Hardly any precautions have been undertaken to meet the situation and the majority of rubber factories are still estimating manufacturing cost upon a basis of machine depreciation much below that which is required by actual conditions. The loss naturally falls upon the shoulders of the rubber industry. But, in addition, there is the very real danger of the industry weakening its financial position in such manner as to court unavoidable disaster if steps are not taken to correct the situation.



Have You Provided for the Accelerated Depreciation of Machinery Equipment Caused by Forced Employment During the War?

EXISTING CONDITIONS.

The condition as existing to-day is best explained by an assumed example of a rubber factory having a machinery equipment costing $200,000 during the year 1914. If this factory is operated upon the general practice of charging 8 per cent to the depreciation fund every year, it has to add to its annual manufacturing expenditure $16,000, which amount would have to be set aside for purpose of renewing the equipment after it has become unsuitable for the purposes of the enterprise. Experience has shown this policy a very sound one in normal times, and allowing 10 years' life to the machinery equipment, a provision of 8 per cent for depreciation would amply cover this factory against loss from this account. It is, therefore, employed without any criticism, and no fault could be found as long as depreciation really proceeded at the rate of 8 per cent and also as long as the price of the equipment remains approximately the same. Both essential conditions for the safe operation of the 8 per cent equal depreciation rule do not work to-day.

The war has changed the fundamental industrial conditions and the rubber factory under consideration has, most likely, not only experienced a more rapid rate of equipment depreciation than that indicated by a depreciation charge of 8 per cent, but it also can not hope by any means to purchase its equipment at the end of the customary ten years—the year 1924—at the same purchase price of 1914. It is fairly certain that the equipment in question will lose its manufacturing effectiveness considerably earlier and that it will cost approximately $400,000 to replace it when this time has come. This factory then has to show at the best only a repurchase fund of $200,000 allowing for accumulated interest of investment, and it will have to find additional funds to put the factory back upon the same basis of efficiency that it had during 1914. The factory has lost a matter of $200,000 in ten years of operation or $20,000 per annum. Incidentally, it has also charged $20,000 every year below its actual manufacturing cost.

Such a loss would be a heavy one in any industry; it is, however, especially dangerous in the case of the rubber industry where competition is very active and where in consequence there is a strong tendency of shading prices. During the war, of course, considerable profits have been made by many rubber factories, but it is doubtful whether a sufficient amount of these profits has been set aside for reserves above the usual depreciation fund in every instance. The chances in fact are that profits have been divided more lavishly than usual, considering the need of the shareholder for larger earnings in view of the high cost of living and the general increasing personal expenditure.

The danger now is that the rubber factories will go to the other extreme and after having made big profits for a few years will try to cut their profits lower than it is safe for the profitable operation of their enterprises, in an endeavor to meet growing competition and a possible decline in the volume of orders. With such a possibility in view, it is essential that the industry should know its working cost to the fraction of a cent and that no miscalculation should be made, as might easily occur if the present practice of charging depreciation cost is continued.

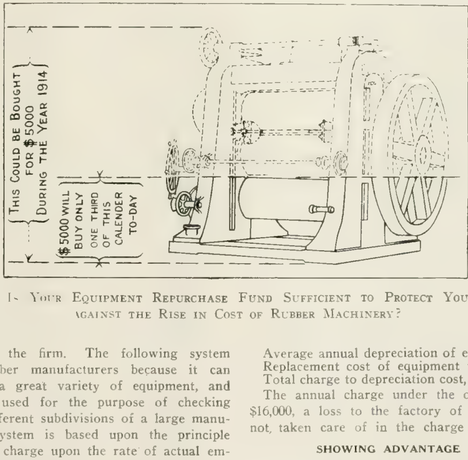
A CHANGE OF ATTITUDE RECOMMENDED.

A new method of charging depreciation, therefore, seems to be urgently required. Such a method to be really useful must not be too complicated, and it must fit every condition so that it can be employed uniformly. The principle in the development of such a method must be a complete change in the attitude of our accountants and factory owners with respect to the depreciation factor in the annual account sheet. The general feeling towards the depreciation charge is to-day one of gentle leniency. To charge depreciation upon equipment permits the factory to make less profits in the eye of the taxation officer; incidentally, the slow writing off of the equipment provides the

accountant with the pleasant feeling that he really strengthens the financial position of his firm. Having followed a safe course for so many years, there is little reason to suspect its unsoundness until actual disaster overcomes the enterprise. The process of attrition proceeds slowly; the danger as a rule is not noticed until it is too late to make amends, and the firm simply goes to sleep as so many others do, after having run through an apparently prosperous existence of 15 to 18 years, the time that is required to make the equipment industrially incompetitive.

Substitute for the word depreciation the word replacement, and an entirely new atmosphere is created. The words replacement fund do not only suggest the recording of the progress of loss of effectiveness in machine depreciation as a matter of routine, but replaces it by an actual payment from the profits of the enterprise as an offset against this loss. A purely theoretical problem becomes suddenly very much alive. Depreciation and loss of effectiveness become tangible meanings, and while opinions may differ about the amount that will have to be written off, it will give the factory its full safety for continued prosperity. Further, if the money is taken actually from the profits there is *prima facie* evidence of the annual cost of depreciation to the factory, and the influence of the depreciation charge upon manufacturing cost is not so easily overlooked. The equipment replacement fund becomes a very effective safety valve, protecting the factory not only against slow depreciation, but giving it the means for making occasional equipment improvements.

A number of systems have been proposed to make the depreciation charge more fitting to actual conditions and to bring the depreciation factor into more immediate bearing upon the cost estimating policy of the firm. The following system may appeal to most rubber manufacturers because it can be easily employed over a great variety of equipment, and because it can easily be used for the purpose of checking depreciation cost in the different subdivisions of a large manufacturing concern. The system is based upon the principle of making the depreciation charge upon the rate of actual employment, and to charge upon the real replacement value of the equipment.



IS YOUR EQUIPMENT REPURCHASE FUND SUFFICIENT TO PROTECT YOU AGAINST THE RISE IN COST OF RUBBER MACHINERY?

HOW THE METHOD SHOULD BE EMPLOYED.

To explain the system it may be best to return again to the original example of a rubber factory with a machinery equipment costing $200,000 during the year 1914. The year 1917 may be used for the purposes of demonstrating the method. This year belonged to the most strenuous years in the war history of the rubber industry. It required an enormous expansion of all production in support of the army equipment industries, and most factories worked overtime all through the year. It does not matter here what the actual rate of employment of our factories was. We may assume, however, that the factory under consideration has worked with three shifts during the second six months of the year, having worked upon a normal production of eight hours during the first half only. Assuming that experience has shown the rate of 8 per cent as approximately correct for the purpose of making a depreciation charge under normal occupation of the equipment, it must be taken for granted that for the first half-year depreciation has normally developed upon the indicated level. From the beginning of July, however, the factory has changed its working policy. It has worked 24 hours a day and equipment has been in use, not the customary eight hours, but three times that period. Depreciation, therefore, has proceeded not at the rate of 8 per cent per day, but at 24 per cent. Loss of industrial effectiveness of the equipment under such conditions would not have been reached after ten years, approximately, but at a time slightly over three years and four months. In fact the equipment would have required renewal during the present year, allowing for a normal depreciation during the years 1914 to 1917. The depreciation of the equipment in this factory, therefore, proceeded at an average of 16 per cent for the whole year, and was less effective industrially than the preceding year when the time came for drawing the annual balance.

Having established in this way the factor of depreciation, it is neccessary to inquire into the value of the equipment to the factory. If the works had burned down suddenly or otherwise been destroyed, by the end of 1917 the equipment could not have been replaced for the $200,000 at which it stood on the books; $300,000 at least would have been needed for that purpose. This also would have been the amount obtained by making a complete valuation of all the equipment of the factory at the existing replacement value. The cost of depreciation of equipment in that factory, therefore, was during the year 1917 as follows:

Six months employment of equipment at 8 hours a day.
Rate of depreciation, 8 per cent.
Six months employment of equipment at 24 hours a day.
Rate of depreciation, 24 per cent.
Average annual depreciation of equipment, 16 per cent.
Replacement cost of equipment to date, $300,000.
Total charge to depreciation cost, $48,000.

The annual charge under the old method would have been $16,000, a loss to the factory of $32,000 in operation cost, if not, taken care of in the charge to manufacturing cost.

SHOWING ADVANTAGE OF NEW METHOD.

But the proof of the pudding is in the eating. Does this system really guard a factory against both the increasing speed of depreciation incurred by increased production and also against the increasing price of the equipment? Let us suppose that equipment prices would have remained approximately the same at the end of 1918 and that this factory also has continued to work at the rate of 24 hours during 1918, with the certainty of having to replace its total equipment somewhere near the end of 1920. We would then have the years 1914, 1915 and 1916 as normal years, with equipment prices remaining approximately at the level of 1914 and employment at 8 hours per day. During three years the factory would then have charged a level 8 per cent of depreciation, and it would have had in hand a repurchase fund of $48,000 plus interest and an equipment still worth approximately seven years' effective employment. The next year 1917 would have added $48,000 to the fund, while 1918 would provide $72,000. By the end of 1918 two years of effectiveness might still be left, and dur-

ing these years $48,000 would have been added to the repurchase fund, assuming in this instance that further increases in the price of the equipment would not have made necessary additional provision for depreciation.

Allowing for accumulated interest from the investment of the annual addition to the repurchase fund, a total amount of $270,000 would then be on hand at the end of 1920. This is still $30,000 short of the actual value of the equipment, but it must be taken into consideration that this equipment has still some value which makes it a marketable property and $30,000 may easily be obtained by selling such equipment, unless the factory decides to use it a few years more on work where less effectiveness and precision is required. Another five years of employment in secondary mauufacturing processes probably would make the equipment obsolete for use in high-class manufacturing, and its sale then would become a necessity. In the meantime, however, its value would have been wiped off completely from the balance sheet of the enterprise, as only another year and a quarter would be required to provide for the additional $30,000.

INFLUENCE UPON COST OF PRODUCTION.

Mention already has been made several times of the effect of such a policy upon the cost accounting practice of a rubber factory. It is obvious that the former policy of charging depreciation upon the original investment on a basis of an equal depreciation rate is giving a wrong impression of the actual cost of the equipment upon manufacturing cost. There is considerable difference if a charge sheet is made upon an overhead charge of $16,000 for machinery depreciation or upon one of $24,000 for instance. But the higher charge is not only justified by conditions but also by the urgent necessity of the present price situation.

All manufacturing, after all, is service rendered in the interest of the buyer. That the manufacturer buys to-day the raw materials and also takes care of the distribution of the article that is manufactured in his plant, does not alter anything in this very fundamental rule of cost accounting. If this manufacturer employs expensive tools in serving his trade the customer must pay his share of the wear and tear of the tools or he must seek out another manufacturer having a less expensive equipment. Let the wear and tear proceed at a quicker pace than normally accepted while the work is done for the customer, and it is only just that the customer also should stand for the increased rate of use. On the other hand, however, three times the rate of the employment also means, most likely, three times the quantity of goods. The increased rate of wear and tear, therefore, spreads over a larger production, and the relative share of each unit of production upon the increased wear and tear of the equipment remains practically the same. This, however, does not apply in the same manner to the increased cost of the equipment. If to replace the unit of equipment costs double what it cost to buy in the past, this increase doubles also in its relationship to each unit of production. Assuming, therefore, a factory employs its equipment at three times the rate of normal, producing also three times as much goods while the equipment price remains the same, there would also be no increase in the cost of manufacture of the individual unit of production. If the cost of the equipment, however, would be double the cost of manufacture of the individual unit of production, its cost will increase at exactly its share of the increased cost of purchasing the equipment.

This is a rule that rubber manufacturers will have to keep in mind when making up their cost charges during the future. Its application will be made more easy if they follow the practice of charging depreciation costs as outlined in this article. With the help of the time books it will be possible to allocate depreciation cost quite correctly to each article manufactured in the factory, whether the process of manufacturing is carried on in one or in several departments.

PRODUCTION, NOT SELLING, IS THE PROBLEM.

By Colonel Samuel P. Colt.

The outlook for the year 1920 in the rubber industry is most flattering. To-day the demand for all lines of rubber goods exceeds the supply. It is not a question of selling goods. It is a question of producing them. In other words, if we could turn out 50 per cent more production than we are able to do with our present manufacturing facilities, the entire output would be disposed of without difficulty. The year 1919 has been the banner year in the rubber manufacturing business. At the time of the armistice it was our opinion that with the virtual closing of the great war and the stopping of government orders there would necessarily be a falling off in the volume of sales of rubber goods, but such has not proved to be the case.

While all lines of rubber goods, such as footwear, mechanical goods, druggists' sundries, etc., show an increase, the most marked development has been in the tire industry. The large tire manufacturers have been unable to supply the demand for tires the past year. In 1914 there were registered in this country 1,574,433 automobiles, and 136,907 automobile trucks. It is now estimated that there are in use 6,800,000 automobiles and 800,000 automobile trucks—a remarkable increase.

When the question is asked, "What is the matter with our trolleys?" I would reply that the fundamental difficulty is the encroachment thereon of the automobile and the automobile truck, and with the improvement and development of our highways, I can see no room for trolley lines along sparsely populated sections. My opinion is that the tracks of many suburban trolley lines will eventually be taken up. Therefore, while the development of the rubber tire has been tremendous during the past five years, there is every reason to believe that it is to-day, comparatively speaking, in its infancy. The effect of the development of the pneumatic tire upon both passenger and freight traffic, or in other words upon our railroads, has, I am convinced, not yet been realized.

The price of crude rubber has been normal during the year, having averaged about 45 cents per pound. It is estimated that 70 per cent of the crude rubber consumption of the world in 1919 was by American manufacturers. With the opening up of Europe, one might look for some increase there, but I would predict that the United States will continue to consume more than half the world's crude rubber product for years to come. We plainly lead the world in rubber manufacturing. Prices of fabrics entering into tires and other rubber goods have ranged higher in 1919 than ever before, the indications being that we have not yet seen the limit of high prices.

The development of plantation rubber in the East has continued unabated. It is most fortunate for the rubber industry that the cultivation of the rubber tree in the vast regions of the East proved practicable, for had we to depend upon the wild rubber of Brazil and other sections, the supply would be so inadequate and the price so exhorbitant that it is difficult to see how the tire industry could have reached its present stage of development, to say nothing of the future.

It is plainly evident that the result of the phenomenal depreciation in foreign exchange has been to curtail American exports. However, with the opening up of Europe our rubber export trade has increased to such an extent that it is now larger in volume than before the war. Moreover, with a permanent change for the better in the foreign exchange situation, which is expected to follow the ratification of the peace treaty, it is only reasonable to assume that our European trade in rubber goods will assume proportions of greater magnitude than heretofore known.

Standard American Export Practice.

As the certain means of insuring unmistakable clarity in terms and conditions of sale, nine of the greatest commercial organizations of the United States interested in foreign trade have in conference adopted a simplified standard American export practice that should greatly facilitate and promote the foreign business of this country. The organizations party to the program are the National Foreign Trade Council, Chamber of Commerce of the United States of America, National Association of Manufacturers, American Manufacturers' Export Association, Philadelphia Commercial Museum, American Exporters' and Importers' Association, Chamber of Commerce of the State of New York, New York Produce Exchange and New York Merchants' Association. The program itself consists of a statement of definitions of the abbreviated forms of price quotations in more or less common and general use in the export trade, which manufacturers and exporters are urged to use habitually as far as possible to the exclusion of other forms synonymous or otherwise; also the recommendation that all use of abbreviated forms be abandoned and that the terms be written out in full.

Manufacturers and exporters are urged to bear in mind that the confusion and controversies which have arisen in American export trade have sprung in part from the use of an excessive number of abbreviated forms with substantially similar meanings, as well as from the use of abbreviations in a sense different from their original meanings, or in an application not originally given them and different from the sense or application understood by foreign buyers. In the simplified and standardized practice agreed upon lies the best hope of reducing confusion and avoiding controversy.

As the most effective measure of simplification, the general practice of quoting for export, as far as possible, either "F. A. S. Vessel," "F. O. B. Vessel" or "C. I. F." is strongly recommended. All of these terms are readily understood abroad and difficult of misinterpretation, and concentration on this small list, it is felt, will be markedly influential in avoiding misunderstanding and disputes.

DEFINITIONS OF EXPORT QUOTATIONS.

The following are, in their order, the normal situations under which an export manufacturer or shipper may desire to quote prices. It is understood that unless a particular carrier is specified by the buyer, the goods will be delivered to the carrier most conveniently located to the shipper.

1. When the price quoted applies only to an inland shipping point and the seller merely undertakes to load the goods on or in the cars or lighters furnished by the railroad company serving the industry, without other designation as to routing, the proper term is:

"F. O. B. (named point)."

Under this quotation:

A. Seller must—
- (1) Place goods on or in cars or lighters.
- (2) Secure railroad bill of lading.
- (3) Be responsible for loss and/or damage until goods have been placed in or on cars or lighters at forwarding point, and clean bill of lading has been furnished by the railroad company.

B. Buyer must—
- (1) Be responsible for loss and/or damage incurred thereafter.
- (2) Pay all transportation charges including taxes, if any.
- (3) Handle all subsequent movement of the goods.

2. When the seller quotes a price including transportation charges to the port of exportation without assuming responsibility for the goods after obtaining a clean bill of lading at point of origin, the proper term is:

"F. O. B. (named point) Freight Prepaid to (named point on the seaboard)."

Under this quotation:

A. Seller must—
- (1) Place goods on/or in cars or lighters.
- (2) Secure railroad bill of lading.
- (3) Pay freight to named port.
- (4) Be responsible for loss and/or damage until goods have been placed in or on cars or lighters at forwarding point, and clean bill of lading has been furnished by the railroad company.

B. Buyer must—
- (1) Be responsible for loss and/or damage incurred thereafter.
- (2) Handle all subsequent movement of the goods.
- (3) Unload goods from cars.
- (4) Transport goods to vessels.
- (5) Pay all demurrage and/or storage charges.
- (6) Arrange for storage in warehouse or on wharf where necessary.

3. Where the seller wishes to quote a price, from which the buyer may deduct the cost of transportation to a given point on the seaboard, without the seller assuming responsibility for the goods after obtaining a clean bill of lading at point of origin, the proper term is:

"F. O. B. (named point) Freight Allowed to (named point on the seaboard)."

Under this quotation:

A. Seller must—
- (1) Place goods on or in cars or lighters.
- (2) Secure railroad bill of lading.
- (3) Be responsible for loss and/or damage until goods have been placed in or on cars or lighters at forwarding point, and clean bill of lading has been furnished by the railroad company.

B. Buyer must—
- (1) Be responsible for loss and/or damage incurred thereafter.
- (2) Pay all transportation charges (buyer is then entitled to deduct from the amount of the invoice the freight paid from primary point to named port).
- (3) Handle all subsequent movement of the goods.
- (4) Unload goods from cars.
- (5) Transport goods to vessel.
- (6) Pay all demurrage and/or storage charges.
- (7) Arrange for storage in warehouse or on wharf where necessary.

4. The seller may desire to quote a price covering the transportation of the goods to seaboard, assuming responsibility for loss and/or damage up to that point. In this case, the proper term is:

"F. O. B. Cars (named point on seaboard)."

Under this quotation:

A. Seller must—
- (1) Place goods on or in cars.
- (2) Secure railroad bill of lading.
- (3) Pay all freight charges from forwarding point to port on seaboard.
- (4) Be responsible for loss and/or damage until goods have arrived in or on cars at the named port.

B. Buyer must—
(1) Be responsible for loss and/or damage incurred thereafter.
(2) Unload goods from cars.
(3) Handle all subsequent movement of the goods.
(4) Transport goods to vessel.
(5) Pay all demurrage and/or storage charges.
(6) Arrange for storage in warehouse or on wharf where necessary.

5. It may be that the goods, on which a price is quoted covering the transportation of the goods to the seaboard, constitute less than a carload lot. In this case, the proper term is:

"F. O. B. Cars (named port) L. C. L."

Under this quotation:

A. Seller must—
(1) Deliver goods to the initial carrier.
(2) Secure railroad bill of lading.
(3) Pay all freight charges from forwarding point to port on seaboard.
(4) Be responsible for loss and/or damage until goods have arrived on cars at the named port.

B. Buyer must—
(1) Be responsible for loss and/or damage incurred thereafter.
(2) Handle all subsequent movement of the goods.
(3) Accept goods from the carrier.
(4) Transport goods to vessel.
(5) Pay all storage charges.
(6) Arrange for storage in warehouse or on wharf where necessary.

6. Seller may quote a price which will include the expense of transportation of the goods by rail to the seaboard, including lighterage. In this case, the proper term is:

"F. O. B. Cars (named port) LIGHTERAGE FREE."

Under this quotation:

A. Seller must—
(1) Place goods on or in cars.
(2) Secure railroad bill of lading.
(3) Pay all transportation charges to, including lighterage at, the port named.
(4) Be responsible for loss and/or damage until goods have arrived on cars at the named port.

B. Buyer must—
(1) Be responsible for loss and/or damage incurred thereafter.
(2) Handle all subsequent movement of the goods.
(3) Take out the insurance necessary to the safety of the goods after arrival on the cars.
(4) Pay the cost of hoisting goods into vessel where weight of goods is too great for ship's tackle.
(5) Pay all demurrage and other charges, except lighterage charges.

7. The seller may desire to quote a price covering delivery of the goods alongside overseas vessel and within reach of its loading tackle. In this case, the proper term is:

"F. A. S. vessel (named port)."

Under this quotation:

A. Seller must—
(1) Transport goods to seaboard.
(2) Store goods in warehouse or on wharf if necessary, unless buyer's obligation includes provision of shipping facilities.
(3) Place goods alongside vessel either in a lighter or on the wharf.
(4) Be responsible for loss and/or damage until goods have been delivered alongside the ship or on wharf.

B. Buyer must—
(1) Be responsible for loss and/or damage thereafter, and for insurance.
(2) Handle all subsequent movement of the goods.
(3) Pay cost of hoisting goods into vessel where weight of goods is too great for ship's tackle.

8. The seller may desire to quote a price covering all expenses up to and including delivery of the goods upon the overseas vessel at a named port. In this case, the proper term is:

"F. O. B. vessel (named port)."

Under this quotation:

A. Seller must—
(1) Meet all charges incurred in placing goods actually on board the vessel.
(2) Be responsible for all loss and/or damage until goods have been placed on board the vessel.

B. Buyer must—
(1) Be responsible for loss and/or damage thereafter.
(2) Handle all subsequent movement of the goods.

9. The seller may be ready to go farther than the delivery of his goods upon the overseas vessel and be willing to pay transportation to a foreign point of delivery. In this case, the proper term is:

"C. & F. (named foreign port)."

Under this quotation:

A. Seller must—
(1) Make freight contract and pay transportation charges sufficient to carry goods to agreed destination.
(2) Deliver to buyer or his agent proper bills of lading to the agreed destination.
(3) Be responsible for loss and/or damage until goods have been delivered alongside the ship and clean ocean bill of lading obtained (seller is not responsible for delivery of goods at destination).

B. Buyer must—
(1) Be responsible for loss and/or damage thereafter and must take out all necessary insurance.
(2) Handle all subsequent movement of the goods.
(3) Take delivery and pay costs of discharge, lighterage and landing at foreign port of destination in accordance with bill of lading clauses.
(4) Pay foreign customs duties and wharfage charges, if any.

10. The seller may desire to quote a price covering the cost of the goods, the marine insurance on the goods, and all transportation charges to the foreign point of delivery. In this case, the proper term is:

"C. I. F. (named foreign port)."

Under this quotation:

A. Seller must—
(1) Make freight contract and pay freight charges sufficient to carry goods to agreed destination.
(2) Take out and pay for necessary marine insurance.
(3) Be responsible for loss and/or damage until goods have been delivered alongside the ship, and clean ocean bill of lading and insurance policy have been delivered to the buyer, or his agent. (Seller is not responsible for the delivery of goods at destination, nor for payment by the underwriters of insurance claims.)
(4) Provide war risk insurance, where necessary, for buyer's account.

B. Buyer must—
(1) Be responsible for loss and/or damage thereafter, and must make all claims to which he may be entitled under the insurance directly on the underwriters.

(2) Take delivery and pay costs of discharge, lighterage and landing at foreign port of destination in accordance with bill of lading clauses.

(3) Pay foreign customs duties and wharfage charges, if any.

Explanations of Abbreviations.

F. O. B.	Free on board.
F. A. S.	Free alongside ship.
C. & F.	Cost and Freight.
C. I. F.	Cost, insurance and freight.
L. C. L.	Less than carload lot.

RUBBER IN THE SAFETY COUNCIL.

The National Safety Council, made up of prominent men in all lines of industry, now has a rubber section. Although this is but a beginning, a score of the largest rubber companies are members and send from two to half a dozen representatives to each meeting. At the first meeting there were present:

E. H. Fitzgerald. M. Klein, The Federal Rubber Co., Cudahy, Wisconsin; Harold Martin, T. J. Dwyer, H. T. Greene, and E. Focand, The Fisk Rubber Co., Chicopee Falls, Massachusetts; P. B. Martens, T. S. Petty, C. G. Dimcombe, A. L. Weyland, E. S. Hoener, N. A. Shepard and M. F. Letzel, the Firestone Tire & Rubber Co., Akron, Ohio; R. N. Watson, and P. A. Belden, The Goodyear Tire & Rubber Co.; W. N. Fitch, W. L. Snyder, J. C. Howard, E. P. Raiford, A. C. Mack, W. G. Oberholser, E. K. Davis, G. A. Knofler, and R. B. Howe, The B. F. Goodrich Rubber Co.; H. G. Pushee, The General Tire & Rubber Co., Akron, Ohio; A. L. Rose, The Kelly-Springfield Tire Co., Akron, Ohio; S. M. Shott, Morgan & Wright, Detroit, Michigan, R. W. Fogerty, A. C. Peterjohn, United States Rubber Co., Mechanical Goods Division, Cleveland, Ohio; W. H. Larkin, Jr., J. W. Towsen, United States Rubber Co., Mechanical Goods Division, Passaic, New Jersey; R. L. Gould, United States Rubber Co.; Dr. Haron, Hood Rubber Co., Watertown, Massachusetts.

ROUND TABLE SUGGESTIONS.

In discussing safety appliances for washers, crushers and mills the following were cited: use of wooden paddles to push rubber between walls; cutting blocks of rubber wedge shape to facilitate entry between rolls; mill rolls placed shoulder high, bars in front of washers over which the sheet of rubber is fed; individual clutches on each mill which are inspected daily; automatic reversing devices.

Electric signals from motor pit to each mill in every line; motor pit switch-boards set six feet above floor to give clear view of line; reports of tests of safety devices signed by inspectors and delivered regularly to master mechanic.

Calenders equipped with electric clutch and brake; special gears for opening center and lower rolls, rolls being lowered so that opening clears the hand; triangular casting at opening with ¾-inch clearance to prevent men from getting near opening; split casting and one-inch slot on fabric calenders; inch bar across calender connected with bell crank to trip switch operating dynamic bar on calendar; floor near calender surfaced with carborundum.

Automatic conveyor system with hydraulic opening for opening molds after curing; special opening bar with increased leverage; special track for hauling molds and cores; endeavor to make men use respirators on dusty job handling compounds; milk served to men in compound room, mills hooded and strong suction used; danger of poisoning from benzol, rash on hands and free from hexamethylene tetramine (eurotropin), eliminated by applying borax in solution with 20 per cent gum arabic.

RUBBER FACTORY ACCIDENT PREVENTION ACTIVITIES TO BE STANDARDIZED.

A census of all the accidents that have occurred in the rubber industry will be undertaken by the Rubber Section of the National Safety Council with the view of standardizing accident prevention activities and accident statistics in that industry. This was decided on at a meeting of the executive committee of the Rubber Section, held at the headquarters of the National Safety Council in Chicago on January 20 and 21. Among those present were S. M. Schott, of the Morgan & Wright plant of the United States Rubber Co., Detroit, Michigan, chairman of the section; E. H. Fitzgerald, Federal Rubber Co., Cudahy, Wisconsin, vice-chairman of the section; R. M. Watson, The Goodyear Tire & Rubber Co., Akron, Ohio, secretary; W. N. Fitch, The B. F. Goodrich Co., Akron, Ohio, chairman of the bulletin committee, and H. T. Martin, The Fisk Rubber Co., Chicopee Falls, Massachusetts, chairman of the program committee.

Plans were also laid at this meeting for a nation-wide membership campaign with the view of including in the Rubber Section of the Council every progressive rubber plant in the country. The officers of the section laid the ground work for an extensive bulletin service and for a sectional program at the next annual congress of the National Safety Council. Twenty-six bulletins depicting the principal hazards in the rubber manufacturing industry and methods of elimination will be issued by this section to its members during the ensuing year along with the general bulletins of the Council.

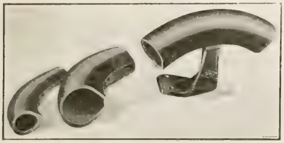
The tentative program for the 1920 safety congress calls for three sessions of the Rubber Section, when the reports of committees will be followed by papers on "The Present and Future of Safety in the Rubber Industry," "Health Hazards in the Rubber Industry," and a general round-table discussion of these topics. The program includes papers and discussions on "Making Mills and Calenders Safe," "Handling Materials," and "Vulcanizing Apparatus." The election of officers will be followed by formal papers and discussions of "Industrial Sanitation" and "Methods of Educating Workmen in Safety."

R. M. Watson was appointed chairman of the committee which will investigate accidents and accident statistics with the view of standardization. The findings of this committee and the classifications recommended will be presented at the next safety congress. H. T. Martin was appointed chairman of the committee on standardization of safety rules and safety instruction. The companies that are now members of the Rubber Section of the National Safety Council are as follows:

Batavia Rubber Co., Batavia, New York; Boston Woven Hose & Rubber Co., Boston, Massachusetts; Braender Rubber & Tire Co., Rutherford, New Jersey; Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ont., Canada; Electric Hose & Rubber Co., Wilmington, Delaware; Federal Rubber Co., Cudahy, Wisconsin; Firestone Tire & Rubber Co., Akron, Ohio; The Fisk Rubber Co., Chicopee Falls, Massachusetts; General Tire & Rubber Co., Akron, Ohio; Gillette Rubber Co., Eau Claire, Wisconsin; The B. F. Goodrich Co., Akron, Ohio; The Goodyear Tire & Rubber Co. of Canada, Limited, Toronto, Ontario, Canada; The Goodyear Tire & Rubber Co., Akron, Ohio; Gutta Percha & Rubber Limited, Toronto, Ontario, Canada; Hood Rubber Co., Watertown, Massachusetts; Kelly-Springfield Tire Co., Akron, Ohio; The McGraw Tire & Rubber Co., East Palestine, Ohio; Mechanical Rubber Co., Cleveland, Ohio; The Miller Rubber Co., Akron, Ohio; New Jersey Car Spring & Rubber Co., Inc., Jersey City, New Jersey; Norwalk Tire & Rubber Co., Norwalk, Connecticut; Oak Tire & Rubber Co., Limited, Oakville, Ontario, Canada; Pennsylvania Rubber Co., Jeanette, Pennsylvania; Philadelphia Rubber Works Co., Akron, Ohio; Plymouth Rubber Co., Canton, Massachusetts; Quaker City Rubber Co., Philadelphia, Pennsylvania; Racine Rubber Co., Racine, Wisconsin; Republic Rubber Corp., Youngstown, Ohio; Rotary Tire & Rubber Co., Zanesville, Ohio; Sprague Tire & Rubber Co., Omaha, Nebraska; Stowe & Woodward Co., Campello, Massachusetts; Thermoid Rubber Co., Trenton, New Jersey; United States Rubber Co., New York City; United States Rubber Reclaiming Co., Inc., New York City.

Machinery Equipment for Tire Repairing and Rebuilding.

The tire repair business has shared in the rapid increase of the automobile and tire industries and many special machines and appliances have been developed for rapid and perfect work. The present article is limited to the principal types of repair shop equipment that are most essential for the work of repairing, retreading and rebuilding tires.



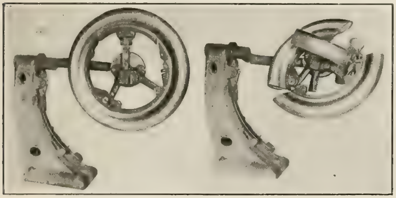
Tire Lasts.

TIRE LASTS.

The tire last is indispensable for supporting the tire while making fabric repairs. It is made of cast iron, the shape of the inside of the casing with convenient brackets for attaching to the bench.

TIRE BUILDING STAND.

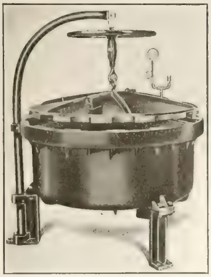
For rebuilding or retreading tires the tire building stand is standard equipment. For this work it is usually provided with a collapsible core, as shown in the illustration. The stand is fitted with an automatic locking device that holds the core securely in any desired position, so that the tire can be revolved in either direction or inclined at any angle.



Building Stand.

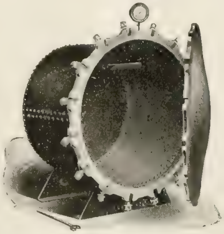
RETREADING KETTLE VULCANIZERS.

In repair plants where retreading is done on a moderate scale, vertical pot heaters or vulcanizers are usually employed for curing the retread, owing to the small steam consumption and relatively small installation cost.



Kettle Vulcanizer.

They usually vary in capacity from two to four tires. Generally they are of the simple kettle type, although the annular construction is particularly economical of steam for a small installation, and will cure from two to four casings at one heat. Others have bolted-on lids or heads held in place by a number of hinged bolts fitting into slots in the edges of the kettle and lid. There is also a boltless variety in which the lid is opened and closed by revolving it about eight inches on a central trunnion, and holding it against pressure by lugs engaging with companion lugs on the supporting frame. Some lids are raised by a screw, chain block or weight, and swung to one side on a crane or overhead track; others are hinged and counterbalanced. Where the lid and the vulcanizer come together the surfaces are machined to accommodate a standard square packing ring.



Horizontal Vulcanizer.

Medium size vulcanizers average 37½ inches in diameter and have a depth of 10 to 26 inches with capacity for two to seven 36-inch casings. Large ones average 43 or 43½ inches in diameter and have a depth of 16 to 31 inches with capacity for four to seven 42-inch casings. Regular equipment includes a steam gage, safety valve, two test cocks and supporting legs. In the case of vertical vulcanizers there is a bottom grating to support the tires above the water from condensed steam and permit steam circulation all around the casings.

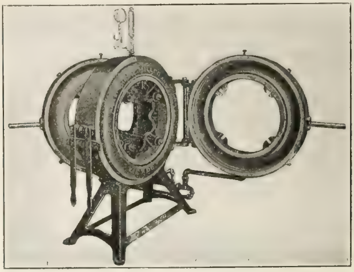
HORIZONTAL RETREADING VULCANIZERS.

In repair plants where considerable retreading is done a horizontal retreading vulcanizer, capable of taking care of all sizes of casings is usually employed. These vulcanizers have a bolted-on, hinged door requiring no overhead tackle or counterweight. They average 46½ or 47 inches inside diameter, and 40 inches in length, with a capacity for six to eight 42-inch tires.

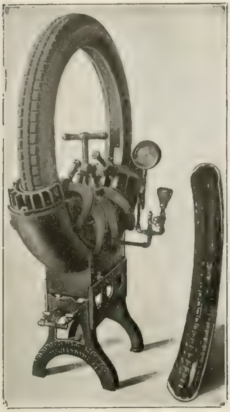
Retreading Mold.

RETREAD MOLD FOR RIBBED OR NON-SKID TREADS.

A retread mold for curing one casing at a time, stands at convenient height on three legs and is very economical of steam.



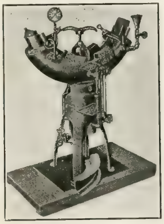
Twin Retreading Mold.



Cavity Retread Mold.

The beads and side walls are not subjected to any steam whatever that might impair the fabric through overcuring or cause separation of the beads. No wrapping is required, and as the pressure of the mold is everywhere uniform, no edges of the plies nor low spots will be visible, nor will the tread be loose as sometimes happens after curing in a pot heater because of careless wrapping.

The use of a retread mold is simple. After the new tread has been applied, an air bag is placed in the casing which is mounted on an ordinary rim. The top half of the mold is raised, the casing placed within, and both halves are bolted together. The air bag is then inflated, steam is turned into the mold, with drip cocks opened and the casing remains in the mold until cured. When removed from mold and rim the tire has the appearance of a new casing.

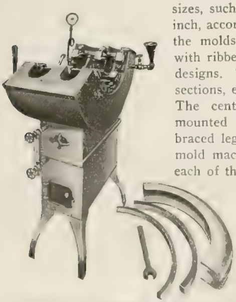


Sectional Cavity Vulcanizer.

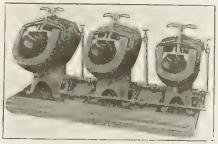
One of the advantages of the retread mold is that the outward pressure exerts an even tension during the cure, so that each cord in the tire carries its share of the load and there are no wrinkles or buckles, causing one ply to work against another and develop a break.

TWIN RETREADING MOLDS.

With twin full-circle molds two casings may be cured simultaneously, both of the same size or neighboring sizes, such as 30 by 3½ and 31 by 4-inch, according to the construction of the molds. They may be provided with ribbed or special non-skid tread designs. The molds consist of three sections, each cored to receive steam. The center member is stationary, mounted on edge and supported by braced legs. It has one-half of each mold machined on either side, while each of the two outside hinged members has the corresponding half. Steam is admitted to all three sections at their lowest points and condensation in the molds is removed by the same pipes. The two outside sections have hinged, swing steam joints directly under the main hinges and can be opened and closed without escape of steam. Four bolts hold the three sections of the mold together. Circular air bags are placed inside the casings and inflated to 125 to 150 pounds' pressure during the cure.



Combination Sectional Vulcanizer.

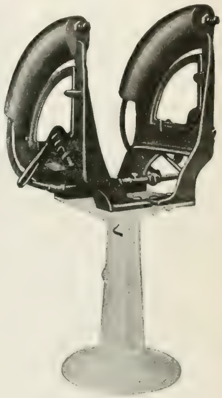


Pneumatic Truck Tire Sectional Vulcanizer.

CAVITY RETREAD MOLD.

When retreading is done on a moderate scale, the cavity retread mold is used. It is similar in operation to the ordinary sectional cavity vulcanizers for curing tread repairs, but is made to cure one-third instead of one-fourth or one-fifth of a 36-inch diameter circle.

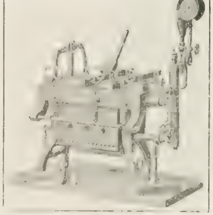
An objection to the principle on which all cavity retread molds work is the fact that parts of casings larger or smaller than 36-inch are subjected to a double cure. The circumference of a 36-inch diameter circle is 113 inches, while that of a 30-inch casing is only 94 inches; obviously when a 30-inch casing is placed three times in the mold for curing, 19 inches of the casing is subjected to a double cure. A 37-inch tire requires four cures to cover its circumference of 116¼ inches, yet four applications of the mold cover nearly 151 inches, so that about 34½ inches are subjected to double cure.



Inside Patch Vulcanizer.

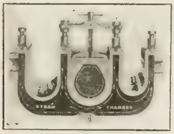
SECTIONAL CAVITY VULCANIZERS.

Sectional cavity vulcanizers for curing outside fabric and tread repairs consist of one to five molds, steam jacketed around the cavity, cast *en bloc* or singly, and made in either one-fourth or one-fifth circle to measure from 15 to 18 inches long on the tread. Three, four and five-cavity outfits are most common, and will accommodate all casings from 2¼ or 2½ to 5-inch. The molds are mounted on substantial metal stands of convenient height, and some are equipped with a self-contained boiler. Separate molds of different sizes, each standing on short metal legs for mounting on a wooden bench, are often assembled with pipe connections, according to local requirements. With a separate mold for each size casing, no reducing shells are required, direct contact is always certain between the hot walls of the vulcanizer and the casing, and there is no uncertainty as to evenness of cure.



Inner Tube Vulcanizer.

Air-cooled flanges are a feature of one make of sectional cavity vulcanizers. One-eighth inch of heat-resisting material is placed between the flanges and vulcanizer, causing both ends of the cavity to remain cool while heat is maintained up to this heat insulating material, thus obviating unsightly and damaging lumps



Air Bag System.

at the ends of repaired sections of the tread.

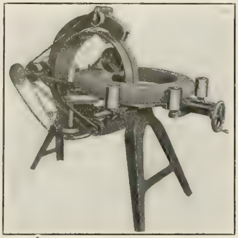
A combination adjustable sectional vulcanizer of unique design is made in capacities from one to six cavities, inclusive. It is furnished with an assortment of adjustable tread and bead molds, to be placed between the movable steam-jacketed side walls. The assembly of parts can be changed in a few minutes to meet the requirements of the work in hand.

PNEUMATIC TRUCK TIRE VULCANIZERS.

The introduction of the giant pneumatic tire has opened a new field in the tire repair business, requiring large sectional vulcanizers. They are made in sizes to fit 6, 7 and 8-inch tires, respectively, each vulcanizer equipped with one pair of straight side bead molds.

INSIDE PATCH VULCANIZERS.

Inside patch vulcanizers made in one-fourth or one-fifth circle, come in small, medium and large sizes. They are of smooth cast iron, designed for mounting on bench or stand, and have suitable steam pipe connections, valves and pet cocks to release cold air from the form. A triangular frame within the supports, together with one or two thumb or crank screws or nuts, provide the necessary bandage tightener.



Power Rag Wrapping Machine.

INNER TUBE REPAIR VULCANIZER.

Inner tube repairs are vulcanized under pressure, in contact with a steam-heated plate.

Adjustable and constant pressure is applied to the tubes while being cured by means of heavy oil-tempered springs, which draw down the swinging levers. A steel nut is placed inside the spring and the handle can be screwed in or out of the nut so that a pressure of six ounces or fifty pounds can be brought to bear on the repair. The adjustment can be changed in an instant.

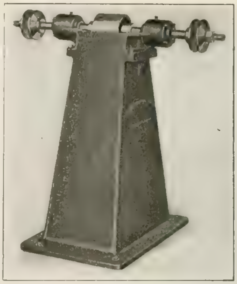
Where solid screw clamps are used it is difficult to properly judge the pressure on the repair. Moreover, as the gum flows during the cure, the thickness of the repair is reduced, partly relieving the pressure on the tube patch. This does not occur with the spring tension system.

Hand Rag Wrapping Machine.

AIR BAG SYSTEM.

In the air bag system of tire repairing, sand bags and wire spirals are displaced by inflatable sectional bags. These air bags are made of fabric and rubber, and at one end have a tube and air valve through which air is forced into the bag. They come in different sizes—one for each size of casing. A machine equipped with air bag molds enables the operator to save time, economize on materials, and turn out a repair that can be guaranteed to outlast the rest of the tire.

The cross-sectional view of a three-cavity vulcanizer, herewith, shows how the steam is conducted to all parts of the three cavities of the air bag molds. Each cavity is so constructed that the steam enters at the lowest point, and rises to the highest, avoiding steam pockets. This construction renders all the molds self-draining. By means of reducing shells, various sizes of tires can be accommodated in the same mold cavity.



Buffing Stand.

POWER RAG WRAPPING MACHINES.

In large plants power wrapping machines are used in preparing retreaded casings for curing. They wrap much more tightly, more quickly and at less expense than can be done by hand.

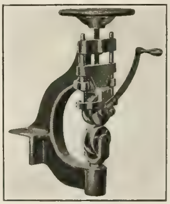
In one type the tire lies flat on a table, and revolves on three rollers driven by two upright feed rollers. There are two other vertical rollers adjustable to the diameter of the casing. A rotary drum, belt-driven, that carries the spool containing the tape, rolls on fiber wheels. One or two spools of tape are required to wrap a tire. The hinged gate of the revolving spool drum is set to the opening in the frame to admit or remove the tire.

A machine of similar construction is built to be fastened to a wall or post. It is quickly adjustable to casings of all sizes by a hand-wheel that separates or draws together two feed rollers.

In connection with these machines a power spool winder is used to roll the wrapping tape ready for use.

HAND RAG WRAPPING MACHINES.

The operation of hand rag wrapping is as follows: The wet bandage is tightly wound on its spool and dropped into a recessed slot in the frame and the pressure arm released against the bandage. A portion of the bandage is unwound and passed through the guides and once around the tire, establishing an over-lap in the bandage and securing the end thereby. The yielding roller arm is clasped about the tire, which is placed on a pair of trestle bars or between two benches, and the machine is rotated around the tire, which causes the bandage to be resistingly drawn from the spool and forcibly applied to the tire. The average tire takes two twenty-five-yard bandages, of course, depending upon the amount of overlap or feed, which is regulated at the option of the operator.



Tread Rolling Machine.

BUFFING STANDS.

Buffing stands are made either with column base and counter-shaft and pulleys for the ceiling, or without countershaft and base for mounting on a bench. Several types have the spindle extended on one end so that a casing can be buffed with a wire brush without interference from the belt or column of the stand, while the short end gives a rigid support for a rotary rasp. An emery wheel may be substituted when desired for grinding tools.

TREAD ROLLERS.

Tread rollers save much time and labor, rolling down the rubber and fabric much more effectively than it is possible to do by hand, and insuring a secure repair. The device consists of a frame designed to be mounted on a bench, a concave and a convex roller, operating crank and hand wheel screw to adjust the space between the rollers.

Government Standard Specifications for Rubber Tires, Tire Repairs and Accessories.

General Specifications.

GENERAL.

These specifications cover bicycle, motorcycle and automobile ribbed or non-skid pneumatic casings, solid tires, pneumatic inner tubes and accessories used by the War Department. The following are details and tests as are common to the products. For specific information applying directly to particular articles, see detailed specifications which shall take precedence whenever there is any conflict.

All casings shall be of the manufacturer's standard non-skid, clincher type, designed for the S. A. E. clincher rim of the sizes as specified in the detailed specifications.

CONSTRUCTION.

To be manufactured from the best designated material; free from all imperfections and of dimensions as given in the detailed specifications or proposal submitted to manufacturer.

(*a*) All Fabric must be thoroughly dried in accordance with standard manufacturing practice before it is rubberized. Any change in the weight or construction must meet with the approval of the War Department and authority be given the manufacturer in writing.

(*b*) Flaps: Each casing shall have a flap in accordance with standard manufacturing practice unless otherwise specified.

(*c*) Lining: The inside of each casing shall be properly lined in accordance with standard manufacturing practice.

MARKING, WRAPPING AND PACKING.

(Does not apply to solid tires.)

(*a*) Marking: Casings shall be plainly marked with raised rubber letters, "U. S. A.," manufacturer's name, serial number, date, size, and the equivalent metric system as recommended by the Society of Automotive Engineers.

(*b*) Wrapping: All casings shall be spirally wrapped according to standard practice and properly labeled on the outside and marked "U. S. A.," size, type, name of manufacture, and the month and year of manufacture stamped thereon in a conspicuous place.

(*c*) Packing: Packing shall conform to requirements as outlined in the original proposal.

MATERIAL.

(*a*) Fabric: The cotton fabric or cord layers shall be well, evenly, and firmly woven from good cotton, as free from unsightly defects, dirt, knots, lumps, and irregularities of twist as is consistent with the best manufacturing practice and conform to detailed specifications.

(*b*) Rubber Compounds: They shall conform to the detailed specification and be free from ingredients known to the rubber trade as "oil substitutes," and contain no reclaimed rubber unless specifically permitted.

When new rubber is specified, it shall be the best quality new wild or plantation rubber.

TESTS.

All tests on material as a whole and on individual parts shall be performed according to methods adopted by the National Bureau of Standards as outlined in their Circular No. 38, "Testing of Rubber Goods," in effect at date of opening of proposal.

Hydrostatic and tensile tests shall be in pounds per square inch. Hydrostatic tests are to be made at the discretion of the inspector.

(*a*) Fabric: The usual methods of inspection used by tire companies in commercial practice to discover defects in each roll of fabric shall be employed.

The tensile strength shall be obtained by cutting strips from fabric 6 inches long, 1¼ inches wide and unraveled from each side to a width of one inch. Jaws of testing machine shall not be more than 1 inch wide and 3 inches apart, separating at the rate of 12 inches per minute. Results obtained by taking the average of three tests each on both warp and filling shall be accepted as the tensile strength of the fabric. The tests shall be made when practicable after conditioning the fabric in an atmosphere having a relative humidity of 65 per cent and at a temperature of 70 degrees F. for two hours. When not practicable to test as above, the fabric may be tested under existing humidity conditions and results corrected to a 6 per cent moisture basis by multiplying by the following factor:

$$\frac{100}{100 \text{ plus } 7 \text{ (per cent moisture } - 6)}$$

Note.—The factor will be less than unity when the per cent moisture is greater than 6, and vice versa.

Moisture shall be determined by weighing six samples together before testing, and tensile strength immediately obtained in rapid succession. The broken samples (entire) after rupture shall be placed in a ventilated drying oven at 105 degrees to 110 degrees C. (221 degrees to 230 degrees F.) until weight is constant. Moisture present shall be calculated on the basis of the bone dry sample.

All fabric weights are given in ounces per square yard, and shall be calculated on 6 per cent moisture basis. Tolerance 3 per cent, plus or minus.

(*b*) Cord Fabric: Tensile strength of cords shall be made on 10 individual cords taken from each cord and the results must be up to the standard specification of the individual manufacturer.

(*c*) Friction or Adhesion: The friction between plies of fabric or rubber compound shall be determined on a sample 1 inch in width, measured circumferentially, and be cut from the casing and tested by using a standard friction or dead weight machine.

On a section of the casing the plies are started and pulled down 2 inches at one bead; which bead is clamped in the jaws of the friction testing apparatus. Test shall be made on any or all plies of the fabric. The adhesion between breaker and tread, breaker and cushion, cushion and carcass, side wall and carcass shall be determined. The rate of separation shall be not more than 1 inch per minute when the weight outlined in the detailed specification is used.

(*d*) Rubber Compound: Test pieces shall be cut longitudinally and shall be ¼-inch wide over a gage length of 2 inches, the ends being gradually enlarged to width approximately 1 inch. Results shall be based upon the average of four tests made at a temperature between 65 degrees and 90 degrees F., unless otherwise specified.

The tensile strength shall be determined with a machine, the jaw separating at the rate of 20 inches per minute. The permanent set shall be determined by sample stretched 2 inches to 10 inches for 10 minutes followed by a rest of 10 minutes, unless otherwise specified.

(*e*) Road Test: Casings will not be given consideration unless the maker submitting the bid furnishes an affidavit stating that he has maintained and will continue to maintain machines used exclusively for test work, as called for in detailed specifications.

The speeds, loads, tire sizes, inflations and road conditions must be such that the casings are properly tested. The Government may appoint an inspector to see that the above conditions are complied with.

A bidder must supply an affidavit before delivering casings to the Government, stating that the casings to be delivered are the same cross-section and practically duplicate, in construction and material as casings which he has previously tested in accordance with the above, and a sufficient number of casings satisfactory to the Government, shall have averaged on the rear wheels the number of miles as called for in detailed specifications.

INSPECTION.

The Government reserves the right to make any inspection test or analysis necessary to insure the product meeting all requirements of specification which shall be conducted in accordance with methods outlined and approved by the War Department, and which shall be furnished to successful bidders.

PNEUMATIC AUTO CASING (FABRIC CONSTRUCTION).

NO. GS 1010 . . . . 30 by 3½ inches.
NO. GS 1011 . . . . 31 by 4 inches.

GENERAL.

(*a*) This specification covers requirements for pneumatic auto casings of fabric construction, size 30 by 3½ inches, which shall be designed to carry a load of 570 pounds when inflated to 55 pounds per square inch and size 31 by 4 inches a load of 815 pounds when inflated to 65 pounds per square inch; both designed for the S. A. E. clincher rim size 30 by 3½ inches.

(*b*) See General Specifications for tires which are a part hereof.

CONSTRUCTION.

See General Specifications.

(*a*) Splices on the first ply of fabric shall be gum stripped.

(*b*) Carcass of casing for 30 by 3½-inch shall consist of not less than four nor more than five separate plies of tire fabric and 31 by 4-inch not less than five nor more than six separate plies, with friction coat on two sides and skim coat on one side. The gage of one ply frictioned on two sides and skim coated on one shall be at least 0.045-inch. Each ply shall have not more than two splices, which must be at least 7 inches apart, and the splices in the casing shall be at least 3 inches apart; all measurements on the circumference of the casing.

(*c*) Beads shall be constructed with a core filler as in standard commercial practice.

(*d*) One chafing strip of square-woven fabric weighing not less than 8 ounces per square yard shall be used on each side of the casing; and shall extend upward on the side of the casing at least ⅜-inch from the channel of the bead.

(*e*) There shall be a cushion of rubber compound applied over the fabric which shall be wider than the breaker. The minimum gage shall be 0.045-inch for 30 by 3½-inch and 0.050-inch for 31 by 4-inch.

(*f*) Over the cushion there shall be at least one breaker strip of open weave fabric made from long-staple cotton weighing not less than 8 ounces per square yard, as in standard commercial practice, coated on both sides with a rubber compound which shall insure a perfect union between the cushion and tread after the cure. Breaker strip for 30 by 3½-inch, minimum width 2¼ inches, for 31 by 4-inch, minimum width 2½ inches.

(*g*) Rubber dimensions:

Sizes	30 x 31½	31 x 4
Thickness	Inches, Minimum.	
Tread of casing in center	5/16	⅜
Tread, exclusive of non-skid portion on center.	⅛	⅛
Side wall	0.05	0.05

(*h*) No flaps shall be supplied.

MARKING, WRAPPING AND PACKING.

See General Specifications.

MATERIAL.

See General Specifications.

(*a*) FABRIC must be square woven (23 by 23) from Egyptian long-staple cotton or its physical equivalent, as approved by the Government, weighing 17¼ ounces per square yard.

(*b*) Rubber compound:

	New Rubber, Per Cent Volume. Minimum.	Reclaimed Rubber, Per Cent Weight. Maximum.
Tread	65	..
Side wall	65	15
Friction and cushion	75	..

TESTS.

(*a*) Cross-sectional diameter of each tire inflated according to the recommended weight and load schedule of the S. A. E. shall be for 30 by 3½-inch less than 3-7/16 inches; and for 31 by 4-inch, 4 inches.

(*b*) Shall withstand water pressure of 300 pounds per square inch without injury.

(*c*) FABRIC: Tensile strength, warp or filling, 165 pounds minimum.

(*d*) FRICTION:

		Pounds.
Strength of union between plies of fabric	minimum	16
Strength of union between breaker and tread	minimum	28
Strength of union between breaker and cushion	minimum	28
Strength of union between cushion and carcass	minimum	16
Strength of union between side wall and carcass	minimum	10

(*e*) RUBBER COMPOUND:

		Tread. Minimum.	Side Wall. Minimum.
Tensile strength		2,200	1,500
Ultimate elongation	inches	2-11	2-11
Set:			
Stretch	inches	2-10	2-10
Set	per cent	25	25

(*f*) ROAD TEST: Manufacturer shall maintain at least two cars used exclusively for test work. They shall average at least 1,000 miles per car per week; and a sufficient number of casings (not less than six) shall have averaged on the rear wheels at least 4,000 miles.

INSPECTION.

See General Specifications.

PNEUMATIC AUTO CASINGS (CORD CONSTRUCTION).

NO. GS 1020	33 by 4 inches
NO. GS 1021	35 by 5 inches
NO. GS 1022	36 by 6 inches
NO. GS 1023	38 by 7 inches
NO. GS 1024	40 by 8 inches

GENERAL.

(*a*) This specification covers requirements for pneumatic automobile casings of cord construction which conform to the following:

Size.	Designed to Carry Load—Pounds.	Inflation Per Square Inch. Pounds.
33 by 4 inches	815	65
35 by 5 inches	1,500	75
36 by 6 inches	2,000	90
38 by 7 inches	2,700	100
40 by 8 inches	3,650	110

Designed for S. A. E. straight side rim as follows:

Casing Size.	Rim Size.
33 by 4 inches	32 by 3½ inches and 33 by 4 inches.
35 by 5 inches	34 by 4½ inches.
36 by 6 inches	36 by 6 inches.
38 by 7 inches	38 by 7 inches.
40 by 8 inches	40 by 8 inches.

(*b*) See General Specifications for tires, which are a part hereof.

CONSTRUCTION.

See General Specifications.

(*a*) Casings shall consist of number of separate plies of cord, applied in such manner that an equal number of plies shall run in each diagonal direction across the casing as follows:

Size.	Number of Plies. Minimum.	Maximum.
33 by 4 inches	4	8
35 by 5 inches	4	10
33 by 6 inches	4	12
38 by 7 inches	4	14
40 by 8 inches	4	16

(*b*) Two chafing strips weighing not less than 8 ounces per square yard shall be used in each side of casing. Each chafing strip shall extend upward on side of casing from the heel of the bead as follows:

Size.	Extension Upward. Inches.
33 by 4 inches	1
35 by 5 inches	1⅛
36 by 6 inches	1½
38 by 7 inches	1¾
40 by 8 inches	2

(*c*) One chafing strip shall extend at least 3/16-inch above the other for sizes 33 by 4 inches and 35 by 5 inches; and ¼-inch for 36 by 6 inches, 38 by 7 inches, and 40 by 8 inches.

(*d*) There shall be a cushion of rubber compound applied over the cords which shall be wider than the breaker and gage as in Table I.

(*e*) Over the cushion there shall be at least one breaker strip of open-weave fabric made from long-staple Egyptian cotton or its physical equivalent as approved by the Government; weight as in Table I, such as in standard commercial practice, coated on both sides with a rubber compound to insure a perfect union between the cushion and tread after cure.

TABLE I.

Size	Gage of Cushion.	Width of Breaker Strip. Inches.	Weight of Breaker Fabric Per Square Yard. Ounces.	Thickness of Tread of Casing in Center. Inch.	Thickness of Tread Exclusive of Non-skid Design. Inch.	Thickness of Side Wall. Inch.
33 by 4 inches	0.05	2¾	10	⅜	⅛	0.0625
35 by 5 inches	.0625	3½	10	7/16	3/16	.0625
36 by 6 inches	.08	4¼	10	9/16	7/32	.0625
38 by 7 inches	.08	5½	18	⅝	¼	.0625
40 by 8 inches	.09	6½	18	11/16	¼	.0625

MARKING, WRAPPING AND PACKING.

See General Specifications.

MATERIAL.

See General Specifications.

(*a*) CORD MATERIAL shall be of the best quality combed Sea Island or Sakellarides cotton or their physical equivalent as approved.

(*b*) RUBBER COMPOUND:

		New Rubber Per Cent Volume.
Tread	minimum	70
Side wall	minimum	65
Friction and cushion	minimum	85

TESTS.

See General Specifications.

(*a*) MEASUREMENTS: Cross-sectional diameter of each tire inflated to recommended weight and load schedule of the S. A. E. shall be:

Size in inches	33 by 4	35 by 5	36 by 6	38 by 7	40 by 8
Diameter	4.2	5.4	6.3	7.35	8.4

(*b*) Tires shall be capable of withstanding water pressure of 350 pounds per square inch without injury.

(*c*) MINIMUM STRENGTH of the casing (strength factor) is the product of the number of cords per inch measured at the tread at right angles to the cords, multiplied by the strength of the individual cords as taken from the cord casing, multiplied by the number of plies:

Size in inches	33 by 4	35 by 5	36 by 6	38 by 7	40 by 8
Strength factor in pounds.	2,000	2,500	3,000	3,500	4,000

(*d*) FRICTION:

		Pounds.
Strength of union between breaker and tread	minimum	32
Strength of union between breaker and cushion	minimum	32
Strength of union between side wall and plies	minimum	14
Strength of union between cushion and plies	minimum	16

(*e*) RUBBER COMPOUND:

	Tread. Minimum.	Side Wall. Minimum.
Tensile strength	2,400	1,500
Ultimate elongation ... inches	2-12	2-11
Set:		
Stretch ... inches	2-10	2-10
Set ... per cent	25	25

(*f*) ROAD TEST: Manufacturers shall maintain at least two cars used exclusively for test and they average at least 1,000 car miles per car week for sizes 33 by 4 inches and 35 by 5 inches; and 500 car-miles per car per week for 36 by 6 inches, 38 by 7 inches, and 40 by 8 inches. A sufficient number of casings (not less than six) for sizes 33 by 4 inches and 35 by 5 inches and not less than four for sizes 36 by 6 inches, 38 by 7 inches, and 40 by 8 inches shall have averaged on the rear wheels at least 5,000 miles.

INSPECTION.

See General Specifications.

PNEUMATIC INNER TUBES (GRAY).

GENERAL.

(*a*) This specification covers requirements for pneumatic inner tubes of the endless type, except motor cycle tubes, which shall be butt end or endless, as ordered, of the following sizes:

GS 1040	28 by 1½ inches
GS 1041	28 by 1⅝ inches
GS 1042	28 by 3 inches
GS 1043	29 by 3½ inches
GS 1044	30 by 3½ inches
GS 1045	31 by 4 inches
GS 1046	33 by 4 inches
GS 1047	35 by 5 inches
GS 1048	36 by 6 inches
GS 1049	38 by 7 inches
GS 1050	40 by 8 inches

(*b*) See General Specifications for Tires which are a part hereof.

CONSTRUCTION.

(*a*) GAGES: Tubes shall conform to the following table:

Size.	Medium Pole Size. Inches.	Minimum Thickness. Inch.	Minimum Finished Length. Inches.
28 by 1½	1	0.048	77
28 by 1⅝	[illegible]	.048	77
28 by 3	1⅞	.072	77
29 by 3½	2¼	.090	78
30 by 3½	2⅛	.090	81
31 by 4	2¼	.095	82
33 by 4	2¼	.110	89
35 by 5	3	.135	92
36 by 6	3½	.180	92
38 by 7	4¼	.210	94
40 by 8	5	.250	96

(*b*) If tube is mold cured, measurements must be equivalent to above as determined by volume, and if larger size poles are used, volume of rubber shall be at least equal to above measurements.

(*c*) The splice shall be as strong as the rest of the tube under the inflation test.

(*d*) Each tube shall be properly fitted with one complete Schrader valve or its approved equal, and not leak or tear out under ordinary usage, as follows:

Size.	Schrader's No. or Approved Equal.
28 by 1½	1022
28 by 1⅝	1022
28 by 3	1936
29 by 3½	1936
30 by 3½	725
31 by 4	725
33 by 4	725
35 by 5	792
36 by 6	2033
38 by 7	2033
40 by 8	2033

Each valve shall be fitted with lock nut, rim nut, valve cap, and dust cap, with exception for sizes 28 by 3, 29 by 3½, 36 by 6 and over. Spreaders shall be furnished for all sizes up to and including 25 by 5.

MARKING, WRAPPING AND PACKING.

See General Specifications.

Wrapping and packing shall conform to requirements accompanying requests for bids.

MATERIAL.

See General Specifications.

Shall be made from a compound containing 93 per cent by volume (minimum) new rubber; sulphur content shall not exceed 7 per cent and organic acetone extract of the cured compound must not exceed 5½ per cent of the weight of new rubber used.

TESTS.

(*a*) Rubber compound: Test pieces shall be ¼-inch wide over a gage length of 1 inch, the ends being gradually enlarged to a width of approximately 1 inch, to provide a satisfactory gripping surface.

Ultimate elongation	inches	1-8½
Set:		
Stretch	inches	1-6
Stretch	per cent	10

(*b*) Each tube shall be tested for leaks by inflating with air and immersing in water.

INSPECTION.

See General Specifications.

Each lot of 1,000 tubes or less shall be tested.

(*To be continued.*)

TIRE AND AUTOMOBILE "SATURATION POINT" NOT IN SIGHT.

With motor vehicle registrations in the United States well past the seven million mark, certain "croakers" are writing much about the "saturation point" and that other indefinite period when the automotive industries must face "diminishing returns."

W. O. Rutherford, vice-president of The B. F. Goodrich Co., Akron, Ohio, scoffs at such pessimism, however. Automobiles, he points out, come in the "consumption" class of commodities; that is, they are used, worn out and replaced just as clothing is. He forecasts that we shall be able to absorb not only the present automobile production, but shall even sustain the greater growth which ambitious manufacturers are meditating. Continuing, he says:

So far as passenger vehicles are concerned we are now at the the crest of a buying market. Production does not equal demand, and personally, I expect this condition to exist for some time to come. I recall being told at one of the New York shows way back in 1907 that the then annual production of 60,000 cars marked the peak point in automobile manufacture and that the number of cars to be made annually would lessen rather than increase. Just as that prophet of gloom was suffering from brainstorm, so will I also classify those who today are refusing to advance with the times. The proposed car production for 1920 is 3,000,000 cars. An analysis of the market, at home and abroad, shows an ability to absorb even greater production, hence the possibility of a shortage of cars is imminent.

Foreign Import Duties on Boots and Shoes.

THE FOLLOWING TABLE, corrected to February 15, 1920, by the Bureau of Foreign and Domestic Commerce, shows the foreign import duties on rubber boots and shoes of all descriptions, imported into the various countries from the United States.

Owing to the frequency of tariff changes the figures and information given in this table should be periodically verified. It is also advised that small trial shipments be made in order to test the rates prior to sending more extensive shipments.

In the first column is given the country, while the next column contains the articles with notes regarding surtaxes, basis of rates, etc. The third column specifies whether the weight is to be taken as gross or net and the last gives the ad valorem duty or the rate of specific duty in United States currency.

Countries.	Articles and Remarks.	Weight.	Duty (U. S. Currency).
Europe:			
Austria-Hungary	Shoemakers' wares, with textile goods, per 100 pounds	Net	$11.05
Belgium	Manufactures of india rubber, ad valorem	...	10%
Bulgaria	Ordinary rubber boots and shoes (galoshes), per 100 pounds (includes 20 per cent surtax)	Net	$10.51
	Other rubber boots and shoes, per 100 pounds (includes 20 per cent surtax)	Net	21.01
Denmark	Rubber boots and shoes, with textiles, per 100 pounds including inner packing	Legal	6.03
Finland	Rubber footwear, per 100 pounds	Legal	11.53
France	Rubber footwear lined with felt, wool or any partly woolen cloth, per 100 pounds	Net	27.57
	Rubber footwear lined with cotton, hemp, or flax cloth, per 100 pounds	Net	22.07
	Footwear with soles of rubber, per pair	...	0.29
Germany	Footwear, with or without rubber soles Unvarnished, per 100 pounds	Net	7.56
	Varnished, per 100 pounds	Net	8.64
Great Britain	Manufactures of rubber	...	Free
Greece	Galoshes of rubber, per 100 pounds	Net	$30.78
Italy	Rubber footwear, lined or trimmed with fabrics, per 100 pairs	...	38.60
	Other rubber footwear, per 100 pounds	Net	4.38
Netherlands	Rubber footwear, ad valorem	...	5%
Norway	Rubber footwear, per 100 pounds	Net	$12.16
Portugal	Rubber footwear, per 100 pounds	Net	38.44
Rumania	Rubber footwear, per 100 pounds	Legal	10.51+2%
Servia	Rubber footwear, per 100 pounds	Net	12.26
Spain	Rubber footwear, per 100 pounds	Net	26.26
Sweden	Rubber footwear, per 100 pounds	Net	14.59
Switzerland	Rubber footwear, per 100 pounds	Gross	2.63
Turkey	Rubber galoshes, boots and shoes	Net	10.50
North America:			
Canada	Rubber boots and shoes, ad valorem	...	25%
	Imports of articles invoiced at prices less than the market value in the country from which exported, are liable to a "dumping" duty if such articles are also made in Canada.		
Newfoundland	Footwear and all manufactures in part or in whole of india rubber or gutta percha, ad valorem, including 10 per cent surtax	...	44%
Central America:			
Costa Rica	Rubber footwear, per 100 pounds	Gross	$21.09
Guatemala	Boots and shoes, and overshoes of rubber or rubberized cloth, per 100 pounds	Legal	46.49
Honduras	Rubber boots, per 100 pounds	Gross	65.44
	Footwear of rubberized cloth, per 100 pounds	Gross	21.81
Mexico	Footwear of rubber or cloth and rubber, including variable surtax taken as equivalent to 3 per cent of the duty, per 100 pounds	Legal	23.29
Nicaragua	Footwear of rubber such as waterproof boots and shoes, per 100 pounds	Net	22.73
Panama	Rubber footwear, ad valorem	...	15%
Salvador	Rubber footwear, per 100 pounds	Gross	$46.14
West Indies:			
Cuba	Rubber footwear with cotton fabrics, per 100 pounds	Legal	11.82
Dominican Republic	Rubber footwear	Net	11.35
St. Vincent	Manufactures of rubber, ad valorem	...	17.2%
Virgin Islands	Imports from the United States	...	Free
South America:			
Argentina	Rubber footwear—includes surtax of 7 per cent—duty based on valuation of $54.72 per 100 pounds	...	47%
	Footwear of cloth and rubber, whole sole measures 25 centimeters (9.84 inches) or less, duty based on valuation of $2.90 per dozen, includes surtax of 7 per cent of valuation	...	47%
	Same footwear, larger sizes, duty based on valuation of $6.76 per dozen, includes surtax of 7 per cent	...	47%
Bolivia	Rubber footwear for men, surtax of 15 per cent is included, based on valuation of $14.00 per dozen pairs	...	51.75%
	Rubber footwear for women and children: Overshoes, rubbers, boots, lined or not, including surtax of 15 per cent, based on valuation of $0.56 per pound, legal	...	46%
	Footwear for women and children with exterior lining, with or without interior lining, including surtax of 15 per cent based on valuation of $0.88 per pound, legal	...	46%
Brazil	Rubber footwear—nominally 3 milreis per kilo.—per 100 pounds	Legal	$58.66
	(Footwear made of Pará rubber, 5 per cent of the rate shown.)		
Chile	Rubber footwear of all kinds, per 100 pounds	Net	33.11
Colombia	Rubber footwear, including surtax of 7 per cent of duty, per 100 pounds	Gross	48.53
Ecuador	Rubber footwear, per 100 pounds	Net	30.02
Paraguay	Rubber footwear, with sole measuring 25 centimeters or less, includes surtax of 1½ per cent of valuation, based on valuation of $8.69 per dozen pairs	...	63.5%
	Rubber footwear of larger sizes based on valuation of $17.37 per dozen pairs	...	63.5%
Peru	Rubber footwear, including weight of inner packing; at ports of Callao, Salavery, Paita and Pisco, surtax of 10 per cent, per 100 pounds	Legal	$32.76
	At other ports—surtax of 8 per cent per 100 pounds	Legal	32.18
Uruguay	Rubber footwear, based on valuation of $5.17 per dozen pairs—surtax of 14 per cent of valuation included	...	62%
Venezuela	Rubber footwear, including surtax of 56.55 per cent per 100 pounds	Gross	$34.26
Asia:			
Ceylon	Rubber footwear, ad valorem	...	7.5%
China and Manchuria	Rubber boots / Rubber shoes } ad valorem	...	5%
Japan	Rubber boots, per 100 pounds	Net	18.82
	Rubber shoes, per 100 pounds	Net	21.79
	Rubber overshoes, per 100 pounds	Net	19.43
Oceania:			
Australia	Galoshes, rubber sand boots and shoes, and plimsolls, ad valorem	...	30%
	Rubber gum and wading boots, ad valorem	...	10%
New Zealand	Rubber footwear, ad valorem	...	34¾%
Africa:			
South Africa	Rubber footwear, ad valorem	...	20%
With a minimum rate of—			
	Men's	...	$0.18
	Women's	...	0.12
	Children's	...	0.06

Legal weight is not uniformly construed, but generally includes the weight of the immediate packing or container, though in some countries fixed tare allowances are made. In Argentina, Bolivia, Paraguay, and Uruguay, the duties are to be computed upon the official valuations at the rates given in the last column.

Foreign Import Duties on Rubber Tires.

The following table, corrected to February 15, 1920, by the Bureau of Foreign and Domestic Commerce shows the foreign import duties on rubber tires of all descriptions imported into the various countries from the United States.

The column marked "Weight" shows whether duties are levied on net or gross weight, or include simply the inner packings. The next two columns give the rate of the duty for each one hundred pounds in United States currency or the rate per cent ad valorem.

In the following monograph the surtaxes have been included and the converted rates therefore indicate the actual duty payable.

Certain charges, such as warehousing, customs handling, local taxes, revenue stamps, etc., are not included. The rates of duty shown, including the surtaxes as noted, should therefore be regarded as the minima. As changes in duties are likely to occur at any time, frequent verification of these figures is advised.

Countries.	Weight.	Rate per 100 Pounds, U. S. Currency.	Rate Per Cent—Ad Valorem.
North America:			
Canada	.....	.....	42.5
(Ad valorem duties are based on the fair market value of the articles when sold for home consumption in the country whence exported direct to Canada.)			
Central American States—			
British Honduras	.....	.....	25
(Duties based on price in the port of export.)			
Costa Rica	Gross	$4.22	.....
(In addition, there is a wharfage tax of 10.5 cents per 100 pounds.)			
Guatemala	Gross	7.21	.....
Honduras	Gross	4.36	....
Nicaragua—Auto tires, inner tubes, solid tires, motorcycle tires, etc.	Net	27.27	...
Panama	.....	.....	15
Salvador	Gross	13.81	.....
(A surtax of 1½ per cent of the duty is included.)			
Hawaii	.....	.....	Free
(Imports from foreign countries are subject to the provisions of the United States tariff.)			
Mexico—Auto and motorcycle tires: Solid	Gross	11.28	.....
Mexico—Auto and motorcycle tires: Pneumatic	Gross	22.58	.....
Bicycle tires	Legal	22.58	.....
(Not including variable paper surtax.)			
Newfoundland	.....	.....	49.5
(A surtax of 10 per cent of the duty is included.)			
West Indies—			
British—			
*Antigua	.....	.....	13.33
†Bahamas	.....	.....	25
*Barbados	.....	.....	11.25
Bermuda	.....	.....	11
Dominica	.....	.....	12.5
*Grenada	.....	.....	10
Jamaica	.....	.....	16.66
(Tires for motor vehicles are subject to a surtax of 20 per cent of the duty, which is to be added.)			
*Montserrat	.....	.....	13.33
*St. Christopher Nevis	.....	.....	11
*St. Lucia	.....	.....	16.5
*St. Vincent	.....	.....	12.5
*Trinidad and Tobago	.....	.....	10
Turks and Caicos Islands	.....	.....	10
Virgin Islands	.....	.....	10
Cuba	.....	.....	25
Dominican Republic—Tires for autos, bicycles, etc.	Net	5.69	.....
Tires for trucks	.....	Free	.....
Dutch Colonies	.....	.....	3
French			
Guadeloupe	.....	.....	6
Martinique (rates not specified)	.....	.....	.....
(Imports of other than French origin pay also the regular French import duties.)			
Haiti	.....	.....	22.24
Porto Rico	.....	.....	Free
(Imports from foreign countries are subject to the provisions of the United States tariff.)			
Virgin Islands of the United States	.....	.....	Free
(Imports from foreign countries are temporarily subject to the duties formerly in force in the Danish West Indies.)			

* When imported from the United Kingdom, Canada or Newfoundland, admitted at a reduction of one-fifth of the duty. The cost of packing is excluded, except in Dominica, St. Lucia and Grenada, where it is included.

† A surtax of 10 per cent is included.

Countries.	Weight.	Rate per 100 Pounds, U. S. Currency.	Rate Per Cent—Ad Valorem.
South America:			
Argentina—Auto and solid tires	Legal	28.02	.....
Bolivia	Gross	20.29	.....
Brazil—Auto tires of Para rubber	....	.....	12.51
Other auto tires	....	.....	28.89
Motor truck tires	....	.....	12.51
Chile	Gross	9.93	.....
Colombia	Gross	0.97	.....
Ecuador	Legal	9.93	.....
Guiana—British	.....	.....	16.5
(When imported from the United Kingdom, Canada or Newfoundland, admitted at a reduction of one-fifth of the duty.)			
Dutch	.....	.....	10
French	.....	.....	5
The regular French import duties are also collected on goods not of French origin.)			
Paraguay—Auto tires	Legal	60.93	.....
Bicycle and motorcycle tires	Legal	90.16	..
Peru—Auto tires	Gross	24.28	.....
Other tires	Legal	36.42	.....
Uruguay	.....	.....	45
Venezuela	Gross	10.28	.....
Europe:			
Austria-Hungary	Net	13.81‡	.....
Belgium—Solid tires	Net	5.69	.....
Auto tires (Casings only.)	Net	10.16	.....
Inner tubes	Net	14.88	.....
Bulgaria—Tires and tubes	Net	5.25	.....
Denmark—Auto tires	Net	6.08	.....
Solid tires	.....	.....	Free
Faroe Islands	.....	.....	Free
Finland—Auto tires; Inner tubes	Legal	17.55	.....
France—Auto tires and tubes	Net	17.08	.
Solid tires	Net	11.38	.....
Cycle tires	Net	37.54	.....
Germany—Auto tires	Net	6.48‡	.....
Inner tubes	Net	6.48‡	.....
Gibraltar	.....	.....	Free
Greece	Net	1.03	.....
Iceland	Net	0.24	.....
Italy—Auto tires and tubes	Net	5.25	.....
Malta	.....	.....	5
Netherlands	.....	.....	5
Norway—Auto tires	Net	3.65	.....
Motorcycle tires	Net	3.65	.....
Poland	Legal	10.79‡	.....
Portugal	Net	1.60	.....
(Conversion to U. S. currency is based on the latest quotation of the paper milreis.)			
Rumania—Auto tires	Legal	9.06	Plus 2% ad valorem
Solid tires	Legal	4.90	Plus 2% ad valorem
Servia	Net	13.16	.....
Spain—Solid tires	Net	17.51	.....
Casings and inner tubes	Net	23.64	.....
Sweden—Auto tires	Net	14.59	.....
Solid tires	Net	9.73	.....
Switzerland—Auto tires	Gross	0.44	.....
Solid tires	Gross	0.69	.....
Turkey	.....	15.00	.....
United Kingdom	.....	.....	Free
Asia:			
British—			
Aden	.....	.....	Free
Ceylon	.....	.....	7.5
(Duty based on wholesale cash price in bond, less trade discount at the port of entry.)			
Cyprus	.....	.....	10
(Duty based on export price with addition of cost of transport [including insurance] to the port of final discharge.)			
Federated Malay States	.....	.....	10
Hongkong	.....	.....	Free
India	.....	.....	7.5
(See note for Ceylon.)			
North Borneo	.....	.....	10
Sarawak	.....	.....	Free
Straits Settlements	.....	.....	Free
China	.....	.....	5
Chosen (Korea)	.....	.....	8
(After August, 1920, the Japanese tariff applies.)			
Dutch East Indies	.....	.....	10
French Indo-China	.....	.....	.....
(Imports from France are admitted free of duty, while imports from other countries are subject to the rates prescribed by the customs tariff of France.)			
Japan (including Formosa)—Auto tires	.....	.....	25
Cycle tires	Net	$42.92	.....
Persia	.....	.....	10
Siam	.....	.....	3
Syria	.....	.....	11% + 1% if imported through Egypt.
Africa:			
Abyssinia	.....	.....	10
Belgian Congo	.....	.....	10

‡Conversion made at normal rate of exchange.

Countries.	Weight	Rate per 100 Pounds, U. S. Currency.	Rate Per Cent—Ad Valorem.
British—			
Mauritius	.....	.....	12
Nigeria	....	..	Free
Union of South Africa	..	.....	20
(Duty based on the current value for home consumption at the place of purchase, including value of packing and agent's commission if it exceeds 5 per cent.)			
Zanzibar	....	.....	7.5
(The dutiable value of imports from Europe or America is taken to be the cost price [with charges], increased by 5 per cent or the invoice price [exclusive of charges], increased by 15 per cent.)			
Egypt	...	....	8
(In Alexandria a wharfage tax of one-half of 1 per cent is added. At other ports different rates are imposed.)			
French Algeria	.....	.....	.....
(Imports from France are admitted free of duty, while imports from other countries are subject to the rates prescribed by the customs tariff of France.)			
Italian—			
Eritrea	.....	.....	8
Libia	.....	.....	11
Somaliland	.....	.....	15
Liberia	.....	.....	12.5
Morocco	.....	.....	12.5
OCEANIA:			
British—			
Australia	.. ..	..	35
(Duty based on fair market value F. O. B. at port of export, plus 10 per cent. On casings weighing over 2½ pounds and inner tubes over 1 pound each, 48.6 cents per pound, if higher than the ad valorem rate.)			
New Zealand	.....	....	1
Guam	.. ..	.....	Free
(Imports of foreign origin are taxed 25 per cent of their value.)			
Philippine Islands	.....	....	Free
(Imports of foreign origin are taxed 25 per cent of their value.)			
Tutuila	.....	.....	10

Legal weight is not uniformly construed, but generally includes the weight of the immediate packing or container, though in some countries fixed tare allowances are made.

A Rapid Method for the Determination of Sulphur in Rubber Mixtures.[1]

By G. D. Kratz, A. H. Flower and Cole Coolidge.

THIS INVESTIGATION was primarily undertaken in order to find an accurate and rapid method for the determination of sulphur in rubber mixtures, applicable to both vulcanized and unvulcanized samples containing various amounts of sulphur. Further, it was desired that the results obtained should be comparable with those obtained by the well known Carius method, or the fusion method of Waters and Tuttle[2], as adopted by the United States Bureau of Standards. Both of the preceding methods, while accurate, involve a somewhat tedious procedure.

CLASSIFICATION OF METHODS.

It will not be necessary to review all of the methods which have been proposed for the determination of sulphur in rubber. Without considering their priority, it will suffice to recall that they can be grouped roughly under three general classifications—direct fusion, solution with electrolytic oxidation and solution, or wet oxidation, with or without subsequent fusion.

Of the direct fusion methods, the use of Eschka's mixture, as proposed by Esch[3], and the zinc oxide-potassium nitrate fusion mixture, proposed by Kaye and Sharp[4], are the best known. The former, although quite accurate, is not sufficiently rapid for general analytical work, while the spurting occasioned by the fusion of rubber with zinc oxide and potassium nitrate is a serious objection to the latter.

The electrolytic oxidation method of Gasparini[5] has been adapted especially for rubber by Hinrichsen[6] and by Spence and Young[7]. The latter modification, in particular, gives very satisfactory results, but requires the use of special apparatus, the installation of which is not warranted in all laboratories.

The method of Henriques[8], however, which involves wet oxidation and subsequent fusion, probably has received the most attention and has been made the subject of the greatest number of modifications, among which is that of Waters and Tuttle. The subsequent fusion of the product of the oxidation with nitric acid with sodium carbonate-potassium nitrate mixture, however, limits the rapidity with which this determination can be made. Several methods have been devised to avoid the use of a fusion mixture. The best of these have been proposed by Roth[9], Stevens[10], and by Rosenstein-Davies[11]. Stevens' method, which has appeared since the results reported in this paper were obtained, has not been compared with our own. It would appear, however, that in it Stevens has modified Roth's method in such a manner that the objections to the latter method, noted by the Netherlands Government Institute, have been largely eliminated. The Rosenstein-Davies method is based, primarily, upon the solution and wet oxidation of the rubber by a nitric acid-bromine water mixture. In order that this oxidation be complete, and the necessity of subsequent fusion be eliminated, it is required that the oxidation be effected at a higher temperature than it is possible to obtain by heating with nitric acid and bromine water alone. To elevate the boiling point, a quantity of arsenic acid is added.

Our experience with the above method has led us to depreciate the use of arsenic acid for the purpose intended. When employed in the recommended quantity (12.5 gms.), it is difficult to remove it entirely from the barium sulphate precipitate. Consequently, in our method, in order to elevate the boiling point, with a substance which can be easily washed free from the final precipitate, we have substituted zinc oxide for arsenic acid. This substitution, while it effects even a higher elevation in the boiling point than is obtained with arsenic acid, has the further advantage of permitting the subsequent fusion being carried to dryness; in the case of the Rosenstein-Davies method, evaporation is continued to syrupy consistency only. Thus, the carrying to dryness, or, as we have termed it, "baking" of the residue, insures a more complete oxidation than is obtained by the above method, and the final oxidation takes place at a temperature far in excess of the boiling point of arsenic acid. After "baking," the residue is taken up in hydrochloric acid, and the zinc is eliminated—as the readily soluble chloride which is easily washed from the barium sulphate precipitate.

In applying our method, we have found the following procedure to give excellent results:

[1] Published by courtesy of the American Chemical Society. Paper read before the Rubber Division of the American Chemical Society, at Philadelphia, Pennsylvania, September 2-6, 1919.

[2] "Journal of Industrial and Engineering Chemistry," Vol. 3, 1911, page 734.

[3] "Chemiker Zeitung," Volume 28, 1904, page 200.

[4] "The India-Rubber Journal," Volume 44, 1913, page 1189.

[5] "Gazetta Chimica Italiana," Volume 37, No. II, 1907, page 426.

[6] "Kolloid Zeitschrift," Volume 8, 1911, page 248.

[7] "Journal of Industrial and Engineering Chemistry," Vol. 4, 1912, p. 413.

[8] "Zeitschrift Angewandter Chemie," Volume 34, 1899, page 802.

[9] "Communications of the Netherland Government Institute for Advising the Rubber Trade and the Rubber Industry," Volume V, page 144.

[10] "Analyst," Volume 43, 1918, page 377.

[11] "Chemist Analyst," Volume 15, 1915, page 4.

THE METHOD IN DETAIL.

The sample, weighing about 0.5 gm., is cut finely with scissors, or is crumbled on the mill, and transferred to a 500 cc. Erlenmyer destruction flask (Pyrex glass).[12] Ten cc. of the zinc oxide-nitric acid[13] solution is added and the flask whirled rapidly to thoroughly moisten the sample. If convenient, the mixture may be allowed to stand over night at this point. By so doing the sample becomes partially decomposed, which permits the addition of fuming nitric acid with no danger of ignition of the sample. Fifteen cc. of fuming nitric acid is then added (all at once) and the flask whirled rapidly to keep the sample immersed in the solution in order to avoid ignition by too rapid oxidation.

With certain samples, it may be necessary to cool the flask under a stream of tap water. When the solution of the rubber is complete, five cc. of a saturated water solution of bromine is added and the mixture is evaporated slowly to a foamy syrup[14]. If particles of organic matter remain at the end of the evaporation, a few cc. of fuming nitric acid are added and the solution is reevaporated to the same consistency as before. The flask is then cooled and a few crystals of potassium chlorate are added to assist in the oxidation of the sulphur and the decomposition of any nitrates.

The mixture is then evaporated to dryness over a Tirrill burner, using an asbestos gauze. While in this position, the contents of the flask is baked at the highest temperature of the burner, until all nitrates are decomposed and no more nitrogen peroxide fumes can be detected[15]. When the "baking" is complete, the flask is cooled and the residue taken up with fifty cc. of (1:6) hydrochloric acid and heated until solution is complete[16]. The solution is then filtered, made up to 300 cc., and precipitated with barium chloride in the usual manner, observing the customary precautions. The barium sulphate precipitate is washed with boiling water until no cloudiness results on testing the filtrate with silver nitrate solution.

DISCUSSION OF THE METHOD.

It was desired to employ the minimum quantity of zinc oxide necessary to effect the complete oxidation of the rubber and sulphur. Several preliminary tests were made with different amounts of this substance. Best results were indicated with two gms. of zinc oxide to ten cc. of nitric acid. The use of these quantities was confirmed by the results obtained for the combined sulphur in a rubber mixture which contained 1.903 per cent sulphur, when estimated by the method of Waters and Tuttle.

Sample No.	Grams Zinc Oxide Used.	Combined Sulphur, Per Cent.
292	1	1.712
292	2	1.907

From this, it is evident, that with less than two gms. of zinc oxide the results obtained are apt to be low.

The barium sulphate precipitates obtained by our method were then examined qualitatively for the presence of zinc. The "Rinmann Green" test for zinc gave negative results, indicating the absence of this substance as an impurity. The true barium sulphate contents of the barium sulphate precipitates obtained by our method were also determined quantitatively in the following manner. The combined sulphur on a sample of rubber was estimated in the usual way. The barium sulphate precipitate so obtained was then fused with one to one sodium carbonate-potassium nitrate mixture, the melt dissolved in water, filtered, acidulated with hydrochloric acid and the sulphates reprecipitated. This determination was carried out in duplicate, and the results are tabulated below. From these results, it is apparent that the difference between the two, when expressed as "per cent sulphur," is negligible, showing that the barium sulphate, as originally precipitated, is practically free from impurities.

Sample	Original Precipitate Barium Sulphate in Grams.	Sulphur, Combined Per Cent.	Fused and Barium Sulphate Reprecipitated in Grams.	Sulphur, Combined Per Cent.
A	0.0805	2.040	0.0781	1.979
B	0.0801	2.030	0.0781	1.979

The possibility of error from the foregoing sources having been determined and found to be negligible, sulphur estimations were made on several different mixtures. In all instances, unless otherwise stated, the mixture subject to analysis was composed of 92½ parts rubber and 7½ parts sulphur. The condition of the mixture, and the nature of the sulphur (total or combined) was varied acording to the experiment.

Our inability to readily obtain satisfactory results for the total sulphur in mixtures composed of rubber and sulphur only, by methods not employing subsequent fusion, led us to first examine mixtures of this type. The total sulphur, as estimated by our method, in both unvulcanized and vulcanized mixtures, was found to be in good agreement with the quantity originally added. In the case of unvulcanized samples, however, we found it best to employ the modification recommended in foot-note 14. Typical results for total sulphurs are tabulated in Table I.

To test the accuracy of our method for the determination of combined sulphur, results obtained by it were compared with similar determinations made by the method of Waters and Tuttle. The results of this comparison are shown in Table II, and are such as to require no comment in regard to them.

TABLE I.

Sample No.	Condition of the Mixture.	Sulphur Added to the Mixture, Per Cent.	Sulphur Found, Per Cent.
321	Unvulcanized	7.5	7.439
348	"	7.5	7.576
597	"	7.5	7.462
288	Vulcanized	7.5	7.551
444	"	7.5	7.498
477	"	7.5	7.498

TABLE II.

Sample No.	Per Cent Combined Sulphur, Method of Waters and Tuttle.	Per Cent Combined Sulphur, New Method.
275	1.960	1.940
277	2.070	2.140
278	2.180	2.140
279	1.960	2.020
280	1.990	2.020
292	1.888	1.898

TABLE III.

Sample No.	Per Cent Sulphur Added to Mixture.	Per Cent Free Sulphur by Bromine-Oxidation Method.	Per Cent Combined Sulphur by New Method.	Per Cent Total Sulphur by Addition.	Per Cent Total Sulphur by New Method.
390	7.5	5.736	1.792	7.528	.....
398	7.5	5.714	1.726	7.440	.....
399	7.5	3.928	3.638	7.566	.....
400	7.5	4.371	3.100	7.471	.....
444	7.5	4.194	3.210	7.404	7.498
477	7.5	4.194	3.256	7.450	7.498

TABLE IV.

Sample No.	Mineral Pigment Added to Mixture.	Per Cent Sulphur Added to Mixture.	Per Cent Free Sulphur by Bromine-Oxidation Method.	Per Cent Combined Sulphur by New Method.	Per Cent Total Sulphur by Addition.	Per Cent Total Sulphur by New Method.
361	Zinc Oxide	2.56	0.893	1.664	2.557	.....
466	Zinc Oxide	2.56	0.740	1.801	2.541	.....
483	Zinc Oxide	3.75	2.486	1.221	3.707	3.830
524	Litharge	7.14	....	....	....	7.188

The figures shown in the Tables I and II were further substantiated by those recorded in Table III. From this table, it is also evident that satisfactory results may be expected when our method is employed for the determination of combined and total sulphur in conjunction with the bromine oxidation method of the United States Bureau of Standards[17] for the determination of free sulphur.

[12] We have found the heavy type Pyrex flask to be remarkably satisfactory at the high temperature at which the baking takes place.

[13] 200 gms. chemically pure zinc oxide in 1 liter of concentrated chemically pure nitric acid.

[14] For the determination of the total sulphur in unvulcanized mixtures, use 3 cc. of bromine in place of the above quantity of bromine water.

[15] Some care should be used at this point to insure uniform penetration of the heat throughout the contents of the flask, and to remove the flask as soon as the "baking" is complete.

[16] In case the original mixture contains barium salts, they will be precipitated at this point. If litharge is present in the mixture, lead salts, not otherwise removed, will be eliminated in the final washing with boiling water.

[17] Circular of United States Bureau of Standards, No. 38, 1915, page 66.

In Table IV we have given a few figures obtained with mixtures which also contained a mineral substance. The results for these mixtures require no comment.

SUMMARY.

Briefly, our method, as herein described, differs from others which eliminate subsequent fusion with sodium carbonate-potassium nitrate mixture, chiefly in the introduction of a process whereby the products of the initial oxidation are "baked" in the presence of zinc oxide. By this means, complete oxidation and the expulsion of oxides of nitrogen are insured. We have found it to be accurate to within 0.1 per cent as compared with the method of Waters and Tuttle. A further advantage which increases both the accuracy of the method and the rapidity of its manipulation is that it does not require the transference of the contents of the flask in which the determination is made until the precipitation of the barium sulphate is to be effected.

We have found that from thirty to fifty determinations can easily be made, by our method, by one man in a week's time. Incidentally, the quantity of nitric acid required is small, in comparison with other methods.

In conclusion, we strongly recommend the determination and subtraction of a blank, to allow for sulphur in the combined reagents employed[18]. This applies, not only to our own method, but, likewise, to any other method as well.

In view of the results recorded above, we are warranted in drawing the following conclusions:

CONCLUSIONS.

1. It is possible to obtain complete oxidation by our method of procedure, which involves baking the residue in the presence of zinc oxide.

2. The results obtained by our method for combined sulphur (as compared with those obtained by the method of Waters and Tuttle), or for total sulphur (as compared with the amount added to the mixture), are accurate to within 0.1 per cent.

3. The rapidity and accuracy with which sulphur determinations can be made by our method recommends its use for routine work in the rubber laboratory.

[18] Our experience with a number of different methods, particularly if used to estimate combined sulphur when present in small amount, has caused us to emphasize this point. It is possible that the subtraction of a blank for the reagents used would have lowered considerably the figure (0.18 per cent) obtained by Fol and Van Heurn ("Communications of the Netherlands Government Institute for Advising the Rubber Trade and the Rubber Industry," Part VI, page 184) for the unextractable sulphur in an unvulcanized mixture. With the best obtainable reagents, blanks will run from 0.05 to 0.15 per cent, according to the method and reagents employed. On repeating the work of Fol and Van Heurn, wherein we extracted the unvulcanized mixture with acetone for twenty-four hours, we obtained a combined sulphur of 0.067 per cent after the subtraction of a blank for the re-agents.

PLANTATION RUBBER, A FORECAST.

Assuming that the acreage planted in rubber will increase at the rate of increase of the years since the war began, which in round numbers is something under 150,000 acres yearly—in the four previous years it was nearly 300,000 acres a year—the average under plantation rubber for 1919 should be 2,900,000 and for 1920 about 3,050,000 acres. It is possible that falling prices may check extension in the countries in British hands, but any such effort will be offset by increased cultivation in the Dutch possessions and in the lands where experimentation with rubber culture, and, above all, with *Hevea*, has been going on scientifically—Borneo, New Guinea, the Philippines, Cochin China and East and West Africa, British, French and Belgian.

There is an effort to restrict in some degree the indiscriminate collection of rubber, for many reasons and in many ways: by planting fewer trees to the acre and farther apart; by tapping at longer intervals and more sparingly in accordance with the theories of scientific experts, who attribute diseases and other mishaps to the methods of tapping, so that in some places trees are tapped only in alternate years or less frequently, in others only on some fraction of the circumference, in all somewhat less recklessly and profusely; by arbitrarily abstaining from collecting a portion of the crop in order that the stock on the market may be diminished and prices be kept higher in consequence.

This is offset by the fact that only the first trees planted have come to full maturity, and that the younger trees planted a score of years ago are maturing by hundreds of thousands of acres yearly, each tree able to yield more latex every year. The full impact of the planting begun in Malaya twenty-five years ago has not been felt, and the millions of trees planted in other suitable lands also have yet to come to full maturity. The annual supply of crude rubber must increase largely from natural causes even if not a single new tree were planted.

The increased demand for rubber in the United States is likely to continue for years to come. The 100,000 tons called for in 1915 had increased 50 per cent in 1918 and had gone nearly to the 200,000-ton mark in 1919. While the building of automobiles may reach its limit within a few years, it is not likely that their use will be checked and a steady supply of tires must be inevitably provided for them.

While the rubber supply from Brazil, Africa, and other districts may be looked upon as likely to stay at 60,000 tons at the most, unless modern and improved methods are applied, the production of plantation rubber in the Far East can easily be increased by 50,000 tons yearly, if the demand calls for that amount at a fair price. In all probability the eastern plantations could soon send in much more than that amount of rubber, if any emergency should demand it, unless some disaster to the rubber culture should intervene, like the boll weevil devastation of Sea Island cotton.

PLANTATION RUBBER ACREAGE, PRODUCTION AND WORLD'S PRODUCTION.

Year.	Plantation Acreage.	Plantation Production (tons).	Total, World Production (tons).
1900	....	4	53,890
1901	....	5	54,850
1902	....	8	52,340
1903	....	21	55,950
1904	....	43	62,120
1905	116,500	145	62,145
1906	294,200	510	66,210
1907	506,550	1,000	69,000
1908	687,350	1,800	65,400
1909	861,150	3,600	69,600
1910	1,122,550	8,200	70,500
1911	1,505,350	14,419	75,149
1912	1,817,350	28,518	98,928
1913	2,021,750	47,618	108,440
1914	2,181,050	71,380	120,380
1915	2,293,750	107,867	158,702
1916	2,458,950	152,650	201,598
1917	2,611,350	213,070	265,698
1918	2,759,950	255,950	*296,579
1919	*2,900,000	285,225	*327,000
1920	*3,050,000	*330,000	*390,000
1921	*3,200,000	*380,000	*440,000
1922	*3,350,000	*430,000	*500,000
1923	*3,500,000	*480,000	*550,000
1924	*3,650,000	*530,000	*600,000
1925	*3,800,000	*600,000	*660,000

*Estimated.

DR. SCHAEFFER VICE-PRESIDENT EAGLE-PICHER LEAD CO.

Dr. John A. Schaeffer, chief chemist and metallurgist of the Eagle-Picher Lead Co., at Joplin, Missouri, for nine years past, was made a vice-president of the company at the annual meeting held in Cincinnati, February 17, with headquarters in St. Louis. He will have, in addition to his scientific duties, full charge of all operations of the company's St. Louis district, which includes the plant at Hillsboro, Illinois, where zinc oxide will be manufactured, and the plant of the Hammar Brothers White Lead Co., recently acquired by the Eagle-Picher company.

Before joining the company Dr. Schaeffer was instructor in chemistry at the Carnegie Institute of Technology at Pittsburgh, Pennsylvania; he is a member of the American Institute of Chemical Engineers and the American Chemical Society. R. E. McCormack, formerly purchasing agent and assistant traffic manager at Joplin, will be his assistant. The offices of the Eagle-Picher Lead Co. are now in the Railway Exchange Building, St. Louis, Missouri.

What the Rubber Chemists Are Doing.

IDENTIFYING ARTIFICIAL RUBBERS.

C. Harries discusses the possibility of identifying the presence of artificial or synthetic rubbers in a special contribution in *"Gummi-Zeitung,"* Volume 33, No. 16, January 17, 1919, page 222,[1] and gives his method in detail.

All previous methods for either qualitative or quantitative examination of rubber substance are incapable of distinguishing which kind of rubber is present because all artificial rubbers yield bromides and nitrosites so similar to those of natural rubber that only by tedious examination can the sources of their derivation be distinguished. The only method available is ozonizing. Even this affords quantitative results only indirectly. First, obtain the rubber substance by the methods hitherto used and then by ozonizing or by separation of the ozonate obtained determine how much of the rubber can be regarded as artificial.

The kinds of artificial rubber to be distinguished are the common isoprene rubber and the so-called carbonate of sodium isoprene rubber. To isolate these products and distinguish them the procedure is as follows:

The watery solution obtained in disintegrating the ozonide is steamed in a vacuum until the residuum is of a syrupy consistency. The aldehydes, diketones and formic acids go off with the steam into the distillation. The residue contains the levuline acids, the succinic acids, and sometimes also another crystallizing product, the levuline aldehyde diperoxide, to which generally no attention need be given. The succinic acid, if it is present, crystallizes quickly and can be expressed. The levuline acids distill in a vacuum below 10 to 12 millimeters at a temperature of about 130 to 150 degrees C. and then give, with acetic acid, phenylhydrazine, a well crystallizing hydrazone with a melting point of 108 degrees C.

For the quantitative estimate of the levuline aldehyde the distillation product is mixed with about 5 grams of acetic acid phenylhydrazine and a few cubic centimeters of diluted muriatic acid, when after standing for a day the levuline aldehyde derivate, the phenyl-methyl-dihydro-pyridazine is set free in solid form. This melts, after it has again been decrystallized with alcohol, at 197 degrees C.

To determine the acetonyl acetone the whole mass is distilled with steam, without first separating the pyridazine. The presence of the muriatic acid turns the biphenyl hydrazine derivative of the acetonyl acetone, with the casting off of a molecule of phenyl hydrazine, into anilino-dimethyl pyrrol which is converted into crystal flakes of 90 to 92 degrees melting point, while the phenyl-methyl-dihydro-pyridazine remains behind in slabs. From the quantity of the anilidopyrrol which appears, certain inferences may be drawn as to the derivation of the isoprene rubber. If some anilino-dimethyl-pyrrol is found, it is a pretty sure indication of the presence of artificial isoprene rubber.

It is to be noticed, however, that the dimethyl butadiene rubber ozonides when disintegrated with water also yield acetonyl acetone, namely, normal dimethyl butadiene rubber, in almost an equal quantity, but the converted Kondakow product only 50 per cent of the amount that the theory calls for. With these, however, no succinic acid is found in the residue. Much anilido-dimethyl-pyrrol would point to the presence of the last two materials. If we have clean normal dimethyl butadiene rubber, when its ozonide is separated, we have a watery solution which, mixed with acetic acid phenylhydrazine gives at once a beautiful yellow precipitate of the biphenyl hydrazone of acetonyl acetone, which, when filtered and weighed, enables us to calculate pretty closely the amount of dimethyl butadiene rubber. The melting point of the biphenyl hydrazone, decrystallized out of diluted alcohol is, according to Paal around 120 degrees C. Pure dimethyl butadiene rubber is the easiest of all artificial rubbers to detect.

[1] "On the Scientific Principles for Identifying Artificial Rubbers by Technical Analysis."

The hardest of the butadiene rubbers to investigate is that whose ozonide in the disintegration yields succinaldehyde. We must proceed in seeking its quality as we do with the isoprene rubbers, namely, steam the watery decomposing fluid in a vacuum. The succinaldehyde passes out with the steam, and gives, when combined with acetic acid phenyl hydrazine, the succinbiphenylhydrazone with a melting point of 125 degrees C. This is very decomposable. Treated with diluted muriatic acid it is converted into a solid, white polymeric base, throwing off phenylhydrazine which melts at 184 to 185 degrees C.

In mixtures of butadiene rubbers with other kinds of rubber, it is extremely hard to demonstrate the presence of succinbiphenyl hydrazone.

With vulcanized products the procedure would be as follows:

The sample to be investigated in the first place must be freed of sulphur as much as possible. This can be brought about only by rolling the sample thin, wetting the surface, and dissolving it with acetone in a Soxhlet apparatus as long as sulphur is taken up by the solvent. Then, after the extraction has continued for about eight days, the sample is rolled out again and subjected to extraction once more for a like period. The sulphur absorbed only colloidally is thus pretty nearly all removed, and the samples retain only the sulphur that is chemically combined. This, when treated with ozone, is converted into peculiar sulphur acids bound to carbon; free sulphuric acid is also developed. In order that these, when the ozonide is boiled with water, shall not harden the aldehydes and ketones that are formed, a few grams of precipitated calcium carbonate are added to the water beforehand in order to neutralize it. Then when it is steamed in a vacuum, the aldehydes and ketones pass over into the distillation, the acids partially bound to the calcium (levuline acids) must be set free and etherized out of the residue by the measured quantity of sulphuric acid, whereupon it may be isolated by redistillation in a vacuum. The individual substance can then be determined as shown above. This method, however, can be used for soft rubbers only and not for hard rubbers.

In conclusion, the author states regarding his method for identifying artificial rubbers that it is still imperfect, but there seems no other possible way at present. The analytical solution of the problem must be accompanied by thorough mechanical tests which presupopse exact knowledge of the physical qualities of the individual materials. During the past few years practical results have been obtained in the identification of series of artificial rubbers submitted for test.

DETERMINATION OF THE SOFTENING POINT OF ASPHALTUM AND OTHER PLASTIC SUBSTANCES.

The following method by D. W. Twiss and E. A. Murphey is from a paper published in the "Journal of the Society of Chemical Industry," December 15, 1919, page 405T.

Substances of the asphaltum type are employed widely in chemical industry under various names, such as gilsonite, grahamite, pitch, elaterite, albertite, bitumen, "mineral rubber," and "hydro-carbon," and as the differences in chemical composition are relatively slight, physical tests become of correspondingly greater importance.

The absence of any definite point of fusion renders all the so-called melting-point methods of examination really methods

for the comparison of the tendency to soften with rise of temperature. Probably the method most commonly applied is that of G. Krämer and C. Sarnow, in which a core of the bituminous material in a glass tube is submitted to the pressure of a drop of mercury of definite weight and the temperature is measured at which the mercury forces its way through the material. This method is probably the most satisfactory but possesses some disadvantages for the avoidance of which the arrangement represented in Fig. 1 is very convenient. The apparatus consists of a U-tube *M* one arm of which is connected by capillary tubing with a gun-metal tap *T*. The central plug of this tap, which forms the most important part of the apparatus, has a conical or tapered bore ¼-inch in length and ⅛ and 1/16-inch in diameter, respectively, at the two ends; the bore is terminated at each end by a flat groove (see Fig. 2) to which its axis is perpendicular; the capillary metal tube of the tap is connected with the glass capillary by means of a well sealed metal sleeve.

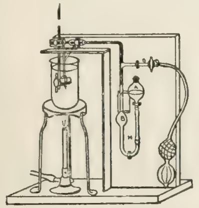


FIG. 1. TESTING SOFTENING POINTS OF ASPHALTS.

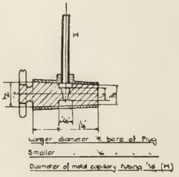


FIG. 2. DETAILS OF TAP T.

To perform a test the sample of bituminous material and the clean plug of tap *T* are warmed in a steam oven for about 10 minutes so that the material becomes somewhat plastic; a piece of the softened material is then pressed into the wider end of the bore of the warm tap plug, as expeditiously as possible, with a small spatula, until the bore is filled throughout and a little extrudes from the other end; the tap plug is then allowed to cool and the excess of material removed carefully so as to leave the exposed surfaces of the material flush with the metal at the end of the bore. The plug is then refitted into its seating in the barrel, being previously lubricated if necessary with a smear of glycerin. From the principle of the test it is essential that the narrower end of the bore should face downwards and be directly above the free opening of the barrel of the tap. Sufficient mercury is present in the U-tube to reach approximately to the equator of the bulb *A* when the pressure is the same in each limb. Air is then forced gently through the tap *S* until the U-tube, acting as a manometer, indicates an excess internal pressure of 1½ inches of mercury between the two limbs. The tap *S* is then closed, when, if the apparatus is properly fitted, the internal pressure remains constant. On warming the medium in the bath, with the usual precautions, a temperature is finally attained at which the air pressure is sufficient to cause the complete extrusion of the core of bituminous material through the narrower end of the bore of the tap plug; the attainment of this temperature is indicated sharply by the sudden rise of the level of the mercury above *B*, and the reading of the thermometer is recorded as the softening point of the material.

The flat grooves cut at the two ends of the tapered bore of the plug of the tap *T* not only facilitate the filling of the bitumen and enable a considerable degree of accuracy in fixing the length of the bituminous core, but also, at the narrower end, provide a convenient space to receive the extruded bitumen so that the subsequent removal of the plug from the barrel is possible without difficulty.

The bulbs *A* (diameter approximately 1¼ inches) and *B* (diameter approximately ¾ inch) are so arranged that any expansion of the air enclosed between *T* and *B*, due to heat received from the bath despite the interposed screen, causes no appreciable alteration in the difference between the mercury levels. The pressure, therefore, is practically constant until the extrusion of the bitumen at the end of the determination. For a second test it is merely necessary to remove the plug of tap *T* and to clean it with a camel-hair brush (or a piece of filter paper) moistened with carbon bisulphate; the apparatus can therefore be kept fitted up ready for immediate use. Any gradual discoloration of the heating medium is of no consequence to the performance of the test. The construction of the tap *T* in metal facilitates the transference of heat to the central core of bitumen and so reduces the "lag" of its temperature behind that recorded by the thermometer. For the heating medium in the bath, glycerin is generally convenient. As the commercial products of the asphalt type have generally been already well mixed when in a fluid condition, the smallness of the sample tested is not detrimental.

The results obtained with the apparatus described above are generally higher than those obtained with the Krämer-Sarnow method, and the essential difference between the two methods of testing the softening is reflected in the fact that, although both methods give concordant results, we have found the difference between the results of the two methods for various materials to range from 5 degrees to 30 degrees C.

In the following table is given the range of the readings obtained with various commercial samples which were tested repeatedly with the described apparatus and by the Krämer-Sarnow method; the first four samples were probably of gilsonite, whilst the fifth was of a coal-tar pitch.

Sample.	Softening Points. Above Extrusion Method. Degrees C.	Krämer-Sarnow Method. Degrees C.
1	155—157	138—140
2	145—147	127—129
3	146—147	124 -126
4	179—181	148—150
5	94— 95	87— 88

It is evident that the apparatus described above will also be of very considerable utility for the comparison of the softening points of other materials, such as gutta percha, balata, etc., which exhibit a similar gradual softening when heated. The relative behavior of various grades of gutta percha and balata towards heat is of great importance for some purposes. On account of the lack of adhesion between glass and gutta the Krämer-Sarnow method is not satisfactorily applicable, whereas our experiments using the method described above have given clear indication of its trustworthiness for this additional purpose. The significance of the test is manifest from the fact that although consistent results are obtainable with various commercial samples, the softening temperature observed ranged from 101 degrees C. for a sample of washed raw balata, to 190 degrees C. for a commercial sample of so-called "pure gutta." It is essential, however, that the portions used for the test should previously be rendered air-free and dry. In making these experiments the same "head" of mercury was used as was mentioned earlier for asphalt materials, but in the comparative examination of balatas or guttas it might be advisable in some cases to apply a greater pressure.

DR. L. J. H. STADHOUDER HAS DISCOVERED A METHOD OF COagulating latex without making use of any coagulating material. Samples of his rubber are being tested scientifically at the Central Rubber Station at Buitenzorg and also at the ***Nederland-Indisch Caoutchouc Fabrik*** at Bandoeng.

CHEMICAL PATENTS.

THE UNITED STATES.

WATERPROOFING COMPOSITION. One gallon neat's-foot oil, eight pounds rubber, one pound tallow, eight ounces beeswax, four ounces resin and one ounce Burgundy pitch. (Daniel Jewett Davies, Pasadena, California. United States patent No. 1,329,162.)

THE DOMINION OF CANADA.

RUBBER RECLAIMING PROCESS comprising simultaneously treating the material to be devulcanized under proper conditions of heat and pressure with a devulcanizing agent comprising xylol and aniline in the proportions of 2½ per cent of aniline and ten per cent of xylol in the presence of a substance capable of combining with or absorbing sulphur. (Firestone Tire & Rubber Co., assignee of John Young, both of Akron, and Winthrop W. Benner, Cuyahoga Falls—all in Ohio, U. S. A. Canadian patent No. 195,875.)

DECORATED RUBBER ARTICLE. The method of making a decorative rubber article by compounding a mass of unvulcanized rubber with a light-sensitive material, forming the compound into the article desired, and subjecting the surface of the article to light rays conforming with the desired design, and then subjecting the article to the action of heat. (The Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, Canada, assignee of Albert A. Somerville, New York City. Canadian patent No. 196,143.)

PAVEMENT COMPOSITION in the form of a block or tile composed of peat, bitumen, marine glue, and slaked lime, transformed by heat to a thick paste and subsequently compressed in a press. (Eugene Audit, Montreal, Quebec, Canada. Canadian patent No. 196,210.)

RUBBER RECLAIMING PROCESS for the separation of cotton fiber or the like from rubber waste which comprises the steps of wetting the waste, passing the waste under a roller and feeding it gradually to a high speed picker whereby the fabric is torn from the waste in the form of threads and fibers and the rubber is torn into small particles, throwing the cotton and rubber together from the picker and separating the cotton from the rubber by blowing the cotton out of its normal course. (The Acushnet Process Co., Inc., New York City, assignee of Philip E. Young, Fair Haven, Massachusetts, U. S. A. Canadian patent No. 196,380.)

RUBBER VULCANIZATION. A process for neutralizing the sulphurous and sulphuric acids and their anhydrous and gaseous forms, generated by the oxidation of the rubber in vulcanized rubber goods having a foundation of fabric, immediately after dry vulcanization is finished and before the goods have cooled, which consists in subjecting the goods to a suitable heat and treating them in an hermetically sealed chamber with undiluted ammonia gas under pressure.

Another claim covers associating with the components of the goods, ingredients which are capable of emitting a gaseous reagent which has a strong neutralizing activity but no prejudicial effect on fabric, rubber, or process of vulcanization. (William Edgar Muntz, London, England. Canadian patent No. 196,564.)

THE FRENCH REPUBLIC.

ACCELERATION OF VULCANIZATION. A process for accelerating the vulcanization of rubber. J. F. B. Van Hasselt. (French patent No. 495,284.)

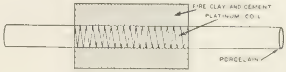
VULCANIZING RUBBER. A process for vulcanizing rubber and similar substances, and the product resulting from it. The North British Rubber Co., Limited. (French patent No. 496,220.)

VULCANIZING RUBBER. Improved method of vulcanizing rubber and similar substances. (The Dunlop Rubber Co., Limited, Birmingham, England. French patent No. 497,327.)

LABORATORY APPARATUS.

ELECTRICALLY HEATED COMBUSTION TUBES.

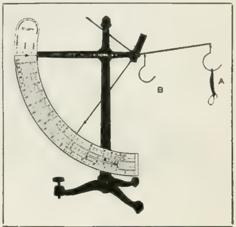
A COMBUSTION tube that is heated electrically has been designed by C. B. Clark, as shown in the accompany illustration. The tube is of porcelain 24 inches long and 0.4-inch internal diameter. The heating element consists of a coil of platinum wire, insulated by fire clay and cement and provided with copper terminals.



ELECTRICAL COMBUSTION TUBE.

INSTRUMENT FOR DETERMINING YARN NUMBER AND WEIGHT OF COTTON CLOTH.

The accompanying illustration shows a device known as a yarn and cloth quadrant, designed for accurately and conveniently determining the number of cotton yarn and the weight of cotton cloth.



YARN AND CLOTH QUADRANT.

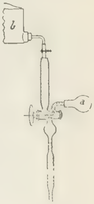
Numbers of yarns from one to ten are determined by placing on hook *B* of the quadrant 40 lengths of either warp or filling yarn, drawn from a sample cut to the size of a template accompanying the instrument; the pointer will immediately indicate the number of the yarn, on the lower "4-yard scale." For numbers from ten to 100, hook *A* is used.

The weight of cloth in yards to the pound and the percentage of size in cloth can also be readily ascertained by this instrument. (Charles Lowinson, Inc., 366 Fifth avenue, New York.)

PIPETTE USED IN TITRATION OF OILS FOR ACIDITY.

The pipette illustrated is described by J. Jacobsen, Aarhus Oliefabrik, Aarhus, Denmark, in "The Journal of Industrial and Engineering Chemistry," August, 1918.

The oil to be examined is drawn, by means of the rubber bulb *a*, into the lower tube, which has a capacity of 5.5 cc., equivalent to 5 grams of oil. The cock is turned and the upper tube is filled with a suitable quantity (10 cc.) of a mixture of ether and methylated spirit, conveniently taken from a tubulated bottle, *b*, which is located just above the pipette. Then the cock is turned again and the oil, followed by the ether-alcohol mixture, is run into a flask and titrated with alkali. In that way the lower tube is cleaned out automatically and is at once ready for a new sample.



TITRATION PIPETTE.

DIXIE CLAY.

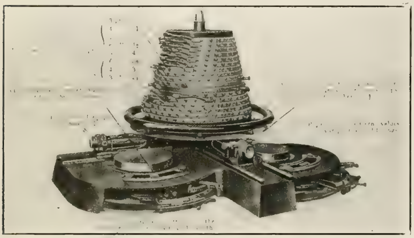
A new compounding ingredient notable for its wear-resisting quality is being offered to manufacturers of tires, footwear, hard rubber, and mechanical rubber goods. It is light in color, mills easily and calenders well in high tensile compounds. (R. T. Vanderbilt Co., Inc., 50 East 42nd street, New York City.)

New Machines and Appliances.

MACHINE FOR CALCULATING FABRIC WASTE IN FOOTWEAR MANUFACTURE.

FIGURING waste percentages on fabric cutting in the rubber shoe industry is a problem which has increased in importance with the rise in price of all kinds of cloth. The method most widely used is to weigh the waste and compute the percentage by either weighing the table of stock before cutting or the cut stock after each performance. The machine here shown has solved this problem for both the leather shoe and the canvas shoe manufacturer. The method involved differs in that it figures in terms of square feet instead of pounds.

To install the service, the manufacturer first sends a model size of each pattern or die, such as men's quarter, size 8, boys'



THE KRIPPENDORF KALCULATOR.

lining, size 5, misses cloth heel, size 13-2, to the laboratory of the machine company for survey. The result of this survey is a pattern value or index which, when computed on the Kalculator, will tell exactly the number of square feet of stock needed to cut out the required number of pairs at the best percentage of waste.

To operate the machine, the pattern value for the model size is set on the indicator. Supposing the ticket to be cut is 36 pairs: 3 pairs, size 6; 4 pairs, size 5½; 5 pairs, size 5; 6 pairs, size 4½; 5 pairs, size 4; 6 pairs, size 3½; 4 pairs, size 3; 3 pairs, size 2½. These sizes and pairs are recorded on the cylindrical dial, the width is set on the scale near the base of the machine, and the answer is found in the center—5¾ square feet. This gives the cutter an accurate goal. He knows that this is the best possible performance.

In cutting leather the general policy is to grade down from the best possible, giving a scale of 8 or 9 performances, leaving it to the manufacturer to decide at which performance he will begin to pay bonus. Leather is so irregular in shape and the quality of different parts of the hides is so varied, that this wide latitude is necessary.

In cutting rubber or canvas duck a scale of 3 or 4 performances is sufficient. The tables of stock are generally uniform in width and length. This makes it desirable to transpose the square feet answer into running feet. Thus, if it requires 51 square feet of stock to cut 36 pairs of vamps, and the tables of stock are 15 feet long and 3 feet wide, it will take 17 running feet of stock or one table and a fraction. The fact that the stocks are laid from 20 to 40 plies in thickness does not complicate matters. The number of pairs in each cut can be easily computed.

There are several advantages of this system over the present methods used in rubber shoe cutting rooms. It eliminates the weighing of waste, stock, and cut stock, all of which takes time and therefore costs money. The only additional equipment it requires is the making of each cutter's table into a scale of feet. A cost clerk can thus very easily complete the cutting record after each performance without moving the stock from the cutters' table. The cost accountant has a reliable figure as to how much stock it takes, including the waste which must go into the cost of the shoe, to cut a pair of every pattern used in all goods from light gum shoes to boots and heavy gaiters. The cutter who has difficult patterns which do not fit or dovetail together well, knows the limits of his patterns, and is not penalized because his percentages are not as low as the cutter who cuts insoles or some oblong shape patterns. The machine is double, thus enabling two patterns to be figured together such as toe tips and fillers.

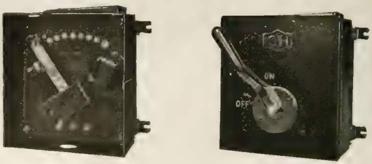
Another advantage of the Kalculator is that it enables the planning department to figure exactly how many running feet of stock the mill room needs to run for each day's ticket. This avoids surplus rolls in the stock room and means less money tied up in unfinished material. (Krippendorf Kalculator Co., Lynn, Massachusetts.)

SAFETY MOTOR STARTERS.

As a safety measure, motor starters should be completely enclosed to protect workmen from coming in contact with live parts. The two safety starters of the enclosed type here shown are therefore of interest.

The first is the familiar type of direct-current face-plate starter enclosed in a sheet metal case having an external lever which engages the movable arm of the starter. The external or operating lever is insulated from the revolving contact arm by a block of molded insulation. A pointer on the lever and legends stamped on the cover indicate whether the starter is "off" or "on." In the smallest size of starter a knob of black insulating composition is provided in place of the operating lever. A low-voltage release coil in series with the shunt field protects the motor in case of voltage failure or if the field should be opened while the motor is running. The armature resistor is completely enclosed in the starter case, which is kept well ventilated by a flue in the top.

This starter is used with direct-current motors up to 50 h.-p., operating at 115, 230 and 500 volts.



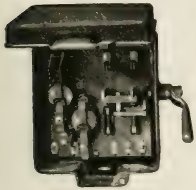
OPEN. CLOSED.

FACE PLATE ENCLOSED MOTOR STARTER.

The second is an automatic motor starter panel of the counter-E. M. F. type completely enclosed in a cast iron case with a hinged cover. The automatic feature is obtained by an accelerating contactor which closes when the motor attains about three-fourths full speed, and automatically shunts out the starting resistor. A magnetic main line contactor mounted on the panel allows remote control from two push-button switches of the momentary contact type.

When remote control is not desired the magnetic main line

contactor is omitted, and the motor is started by a fused knife switch mounted on the panel with an operating handle outside of the case. The handle can be locked in the open position to prevent unauthorized operation. Interlocks prevent lifting the cover while the switch is closed or throwing the switch with the cover opened. This starter is for use with small direct-current motors not rated over 2 h.-p. at 115 volts or 3 h.-p. at 230 volts. (The Cutler-Hammer Manufacturing Co., Milwaukee, Wisconsin.)



Open. Closed.
Automatic Enclosed Motor Starter Operated by Handle or Push-Buttons.

HYDRAULIC ACCUMULATOR SYSTEM.

The illustration shows a type of hydraulic accumlator installation that is representative of those in use in up-to-date rubber factories. It is a high and low pressure hydraulic accumulator and intensifier system that is automatic in operation and furnishes both high and low pressure to a battery of hydraulic presses without attention from the operators other than the manipulation of the regular press operating valves.

Hydraulic Accumulator.

The high and low pressure triplex hydraulic pumps that furnish the water supply against the pressure of the accumulators are motor driven. Each pump is automatically controlled from an electric switchboard which stops the pump when the accumulator load is raised to a predetermined point and again starts it when the accumulator recedes below this point.

This system has the capacity for developing any pressure from 350 to 10,000 pounds per square inch. (The Hydraulic Press Manufacturing Co., Mount Gilead, Ohio.)

MACHINE FOR MAKING BIAS FABRICS.

Cotton and silk cloth of ordinary square-woven type in which the warp and filler threads are at right angles, may be converted into bias fabrics on the machine here shown. The warp threads remain in their original position but the fillers are inclined at an angle other than 90 degrees to the warp. This is effected by two series of interconnected grippers that grip the fabric edges and being mounted on endless chains, one of which is retarded, the filler threads, while remaining parallel, are drawn into an angular position with regard to the warp; the width of the web being slightly reduced.

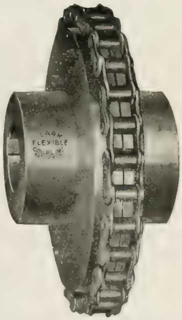
The bias web thus produced is impregnated with rubber solution on a spreader, after which two plies are superposed with the bias threads at opposite angles and united by passing through pressure rollers of a doubling machine. The result is a strong, non-raveling bias fabric suitable for the manufacture of raincoats, auto fabrics, imitation leather, mechanical goods, and possibly, tire fabrics. (Albert Herzog, 118 East 25th Street, New York.)

Bias Fabric Machine.

A FLEXIBLE COUPLING FOR MILL LINES.

This coupling is designed for use on shafts where absolute rigidity is not desired and a certain amount of flexibility is required. The device consists of two sprockets rigidly fixed to the ends of the shafts to be connected. An endless chain encircles these sprockets, thereby coupling the ends of the shafts but affording sufficient lateral play to accommodate ordinary differences in shaft alinement.

The smallest coupling of this type transmits less than one-quarter of a horse-power, while the largest weighs three-quarters of a ton and transmits 3200 horse-power. (I. H. Dexter Co., Goshen, New York.)

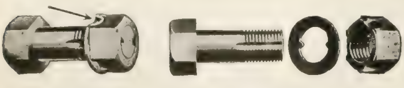


Clark Flexible Coupling.

A SAFETY INTERLOCKING NUT AND BOLT.

This is a bolt with a nut that it is said will stay locked under all conditions and may be easily unlocked if required. The principle of construction may be seen in the accompanying illustrations. The washer has two extending inner lugs which slide in two lateral grooves extending the full length of the threaded portion of the bolt. The nut, which in the hexagon type has three or in the square nut, four recesses or chucks

formed in the base, is then applied and brought home to the desired point of contact and the washer upset or bent into the



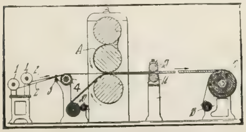
STEVENSON SAFETY BOLT AND NUT.

recess by means of a cape chisel and a hammer blow. For releasing, the upsetting operation is reversed, the same washer being used repeatedly. (The Safety Nut & Bolt Co., 1836 Euclid avenue, Cleveland, Ohio.)

MACHINERY PATENTS.

CORD COVERING AND CORD FABRIC MACHINE.

STRANDS of fabric are covered with rubber and strand fabric for making cord tires is produced on this machine by the calender method, and without crushing or distorting the strands. A series of bobbins 1, 1, supply the strands 2, that are alined by comb 3, and grooved roller 4. In passing between the calender rolls, the strands are enclosed, without pressure, between two sheets of rubber, one from the calender roll A, and the other from stock roller 10.



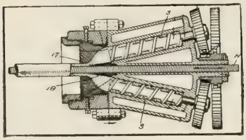
CORD FABRIC MACHINE.

The sheet is thus passed between fluted pressure rollers 13 and 14 that embed the individual strands in the rubber without flattening them, and the completed fabric is then wound up on drum 17 with a liner from drum 18. (Melvon A. Marquette, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts. United States patent No. 1,321,223.)

HOSE MAKING MACHINE.

As shown in the horizontal sectional view, this is a two-screw forcing machine for coating hose with rubber.

In the operation the rubber from the pockets 3 is forced into the die at diametrically opposite sides of the tube H. It flows in both directions about the guide 19 as it moves through the die to the opening 17. Rubber from one screw pocket passes upwardly about the guide 19 while other rubber from the same pocket passes downwardly about the guide. These two bodies of rubber meet corresponding bodies from the second screw pocket at a point substantially midway and, due partly to the reducing diameter of the die and partly to the churning, or agitating, action of the closely juxtaposed screws, the joint between the meeting bodies becomes more or less kneaded. A homogeneous union and an even density is thus secured as the joining bodies are forced out through the opening 17.



TWO-SCREW FORCING MACHINE.

The disposition of the screw pockets at an acute angle relative to the line of feed of the tube H enables the rubber to move toward and through the opening 17 without material change in its general direction of travel. This also increases the efficiency of the device and provides a structure in which no packing is required between any of the moving parts. (John M. Oden, Brooklyn, New York. United States patent No. 1,322,464.)

OTHER MACHINERY PATENTS.

THE UNITED STATES.

NO. 1,327,237. Device for fastening together nested tire casings. C. M. Horton, Elizabeth, N. J., assignor to The Singer Manufacturing Co., New York City.

1,327,264. Single tube pneumatic vulcanizing core. A. O. Alsten, Worcester, Mass.

1,327,307. Tire retreading apparatus. R. A. Brooks, Chicago, assignor to Western Rubber Co., Chicago, a copartnership consisting of said Brooks and G. W. Clark, Oak Park—both in Illinois.

1,327,393. Tire fabric testing machine. A. E. Jury, Newark, N. J., assignor to the United States Tire Co., New York City.

1,327,802. Apparatus and method for manufacturing tires with a spheroidal depression in one surface. J. A. Bowerman, assignor to The Fisk Rubber Co.—both of Chicopee Falls, Mass.

1,327,826. Apparatus for making strand fabric. W. Jameson, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls—both in Mass.

1,327,841. Tire vulcanizer. F. B. Pfeiffer, Akron, O.

1,327,904. Apparatus and process for treating yarn or fabric. W. C. Carter, Radnor, assignor to The Goodyear Tire & Rubber Co., Akron—both in Ohio.

1,327,910. Machine for making tires. W. B. Harsel, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

1,328,330. Repair vulcanizer. F. G. Knoflicek, Silvis, Ill.

1,328,676. Tire core. E. A. Krannich, Columbiana, assignor of ½ to L. A. Andregg, Mansfield—both in Ohio.

1,329,239. Device for peeling tires. E. P. Hafner and J. T. Roberts—both of St. Louis, Mo.

1,329,312. Mold for making rubber articles. F. T. Roberts, Cleveland, O.

THE DOMINION OF CANADA.

195,882. Portable repair vulcanizer. The Horsey Products Co., assignee of E. T. Horsey—both of Cleveland, O., U. S. A.

195,906. Apparatus for trimming edges of rubber articles such as boots and shoes. The Wood-Milne, Limited, Manchester, England, assignee of J. Summer, Leyland, County of Lancaster, England.

196,152. Machine for trimming tire casings. Firestone Tire & Rubber Co., assignee of E. D. Putt—both of Akron, O., U. S. A.

196,207. Machine for forming tires. L. P. Arnold, Norwalk, Conn., U. S. A.

196,395. Apparatus for opening tire molds, etc. The Dunlop Rubber Co., Limited, Westminister, County of London, assignee of C. Macbeth, Birmingham, County of Warwick, both in England.

196,396. Apparatus for making solid rubber tires double, then cutting apart. The Dunlop Rubber Co., Limited, Westminster, County of London, assignee of C. Macbeth, Birmingham, County of Warwick—both in England.

196,624. Machine for building pneumatic tire casings. E. Hopkinson, New York City.

196,661. Machine for making tires. The Goodyear Tire & Rubber Co., assignee of W. B. Harsel—both of Akron, O., U. S. A.

195,997. Tire band stretching machine. J. L. Dykes, Chicago, Ill., U. S. A.

GERMANY.

319,301. Scraping knife. Vereinigte Gummifabriken Harburg-Wien, formerly Menier J. N. Reithoffer, Harburg-on-the-Elbe.

THE FRENCH REPUBLIC.

495,103. Apparatus and process for vulcanizing rubber. American Rubber Co.

497,524. Improvements in vulcanizing presses. The Dunlop Rubber Co., Limited.

PROCESS PATENTS.

THE UNITED STATES.

NO. 1,326,991. Manufacture of rubber tires. J. A. Swinehart, Akron, O.

1,328,006. Manufacture of pneumatic cord tires. N. W. McLeod, St. Louis, Mo.

1,328,541. Impregnating and coating fibrous material with rubber. J. F. Palmer, St. Joseph, Mich.

1,329,311. Manufacture of inflated golf balls. F. T. Roberts, Cleveland Heights, assignor to The Aranar Co., Cleveland—both in Ohio.

THE DOMINION OF CANADA.

195,739. Repairing tires. C. C. Gates, Denver, Colo., U. S. A.

195,741. Retreading tires. S. H. Goldberg., Chicago, Ill., U. S. A.

195,926. Retreading tires. S. H. Goldberg, Chicago, Ill., U. S. A.

196,544. Manufacture of pneumatic tire casings. E. Hopkinson, New York City, U. S. A.

THE FRENCH REPUBLIC.

496,020. Improved method of attaching rubber soles to shoes. L. J. Frank.

496,659. Method of fastening valves to inner tubes of bicycles and automobiles. C. J. Fauerbye and S. Alstrup.

496,850. Improved process for manufacturing waterproof products. L. Kirschbraun.

497,363. Improved process for manufacturing non-inflated rubber balls. K. Fukuda, Tokio, Japan.

497,415. Improved manufacture of rubber tires. The Dunlop Rubber Co., Limited.

497,423. Improved construction of solid tires. The Dunlop Rubber Co., Limited.

497,489. Improved construction of inner tubes for pneumatic tires. The Dunlop Rubber Co., Limited.

New Goods and Specialties.

A GLOVE THAT GRIPS.

A PATENTED GLOVE suitable for automobile driving and other uses where it is essential that a firm grip be secured is illustrated in the accompanying picture. It is made of canvas or other fabric, to which is vulcanized a thin membrane of rubber in any form desired. The illustration shows a series of circular gripping surfaces provided on the glove, one large one on the palm and other smaller ones at intervals on the fingers and thumb. These rubber surfaces are ribbed to produce a somewhat roughened contact. The glove may be made with the back open for hot-weather wear. The same idea is also not limited to gloves, but is applicable to mittens as well. (Joseph M. Reynalds, Atlantic, Iowa.)

RUBBER GRIP GLOVE.

TO PROTECT SHOE TOES.

An ingenious device for the protection of the toes of the shoes of bootblacks, chauffeurs, or other persons whose work entails wear on that portion of the shoes, is illustrated herewith.

The cap or crown is formed of rubber vulcanized to a fabric foundation and having the edges turned inward under the sole. Beneath the sole is a piece of woven wire with the edges turned upward and embedded in the rubber. This layer of wire is covered on the outside with rubberized cloth and on the inside with a layer of rubber. The device is held in place by straps which connect with each other and buckle, one around the foot and one from beneath the arch back of the ankle. (Anthony S. Stebor, Jr., 914 George street, Plainfield, New Jersey.)

SHOE PROTECTOR.

A RUGGED CORD TIRE.

The Castle cord tire recently developed, of which a photograph is reproduced herewith, strives for perfection of type coupled with a practical non-skid tread of rugged design.

This tire is the combined result of research and experience in tire manufacturing, with the idea of producing a tire of balanced quality. (New Castle Rubber Co., New Castle, Pennsylvania.)

CASTLE CORD TIRE.

TWO NEW GOLF BALLS.

Those who follow the offerings of the sporting goods dealers to the devotees of golf will be interested in two new dimpled golf balls recently put on the market. They are known as the Eagle No. 1 and No. 2. No. 1 is high-powered, small and heavy, being 1.63 inches in diameter and weighing 1.64 ounces No. 2 is light and soft, is 1.655 inches in diameter, and weighs the same as No. 1, being intended for the average golfer who should not attempt too much weight. (A. J. Reach & Co., Philadelphia, Pennsylvania.)

A RED RUBBER FAN BELT.

A new red rubber belt for the operation of automobile fans has just been put on the market under the name of "Samson." It is made in various sizes to fit practically all cars made or used in Canada, and is put up in boxes containing six of a size, with a label stating the size and the makes of cars which the belt will fit, thus enabling the dealer to lay his hand at any time on any size of belt required for a particular make of car. This belt, it is claimed, will withstand severe tests, one having comprised soaking in cylinder oil for 500 hours at one time. This was done to demonstrate that the tensile strength of the belt is greater than would ever be actually required. (Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ontario, Canada.)

"SAMSON" FAN BELT.

A NEW DUST CAP FOR TIRE VALVES.

A new dust cap for tire valves, known as the "Kwik-on-an-Off," slips over the valve stem and locks with one turn. It remains securely fastened until it is necessary to remove it, when a slight turn in the reverse direction disengages it and permits easy removal. The mechanism is patented and consists of a one-piece shell enclosing a friction spring which fits into the tapered portion of the cap and contracts to grip the threads of the valve stem. (A. Schrader's Son, Inc., 783 Atlantic avenue, Brooklyn, N. Y.)

"KWIK - ON - AN - OFF" DUST CAP.

AN ENDLESS AIR BAG.

The gray endless air bag pictured here prevents damage or marks, it is claimed, to fabric when placed inside tires during vulcanization of retread or recover. A smooth, even pressure is insured to every part of the tire, and separation and blistering are avoided. The bag is of tough, high-grade fabric, coated with a special rubber friction not easily affected by heat. (Firestone Tire & Rubber Co., Firestone Park, Akron, Ohio.)

FIRESTONE AIR BAGS.

A RUBBER GLOVE WITH KNUCKLES.

Surgeons' gloves are now made with allowance for the knuckles, thus, it is claimed, preserving the "cuticle touch" in all its sensitiveness and acuteness at the same time that a perfect-fitting sanitary hand covering is provided. These "KnuklfiT" gloves give free and easy finger action, free circulation of the blood, and eliminate tension on the finger tips. Oversize gloves are no longer required, with their awkward wrinkles and folds. It is also claimed for these gloves that they retain their shape and may be sterilized more times than most other rubber gloves. (The Lincoln Rubber Co., Akron Ohio.)

SURGEON'S "KNUKLFIT" RUBBER GLOVE.

A REINFORCED BLOW-OUT PATCH.

A new kind of blow-out patch is constructed with a layer of wire mesh inserted in the center, embedded in a layer of cushion stock that is vulcanized to fabric on each side. This permits flexibility without separation, while the wire insert resists pressure evenly and affords protection to any rupture in the tire casing. It extends to within three-quarters of an inch of each edge with at least five plies of fabric covering the wire completely. This patch contains from five to nine plies of high-grade fabric, the number being determined by the size.

"DUR-A-BUL" WIRE KNIT BLOW-OUT PATCH AND "EASY-ON" HOLDER.

With these patches is used the "Easy-On" holder, which hooks them around the casing and holds them securely to the sidewall while putting on. The holder is removed after inflation. (Durham Manufacturing Co., 1518 Grand avenue, Kansas City, Missouri.)

PNEUMATIC LIFE SAVING GARMENT.

A convenient inflatable garment intended to be used as a life-preserver is shown in the accompanying photograph. This garment, however, may be worn underneath or over the clothing, as desired. Three seconds is said to be sufficient time for inflating, and, as the garment weighs only ten and one-half ounces and folds up compactly when not inflated, the whole may be carried in the coat pocket.

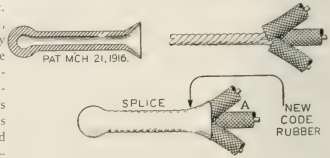
When desired, this garment can be fitted into coats, vests, bathing suits, knitted sweaters and Jerseys, or any other wearing apparel.

GRIFFIN PNEUMATIC LIFE-SAVER.

The inner tube of the Griffin pneumatic life-saving garment is of rubber, and it is claimed that the speedy inflation valve took three years to perfect. (The Griffin Manufacturing Co., 113 State street, Boston, Massachusetts.)

RUBBER SPLICE INSULATOR.

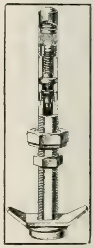
A new kind of insulator for electrical splicing is explained by the accompanying drawing. It consists of a small rubber cap, long and narrow, with an enlarged mouth which permits it to be stretched over end-splices at outlets, in junction boxes and the various fittings of conduit, cable and metal molding work, on terminal splices in motor leads and on splices in fixtures. The use of this device is said to eliminate grounding and entirely prevent short-circuits at end-splices in outlet boxes, etc. Besides, it smoothly covers the rough surfaces of soldered splices and saves time and labor in applying. "Elasticaps" now come in one size, but a larger size is planned to accommodate larger splices such as three No. 14 wires or two No. 10 wires spliced, etc. (The Elasticap Co., Hoboken, New Jersey.)



"ELASTICAP" ELECTRICAL INSULATOR.

AN AUTOMATIC SAFETY TIRE VALVE.

An automatic safety tire valve that "whistles when it's had enough" air has a large hole through the valve stem, from end to end. The inside or check valve seats on top of the stem and is held securely in place, making an air-tight seal by the joining of the stem with the pressure regulator. When sufficient air has been pumped into the tire, a whistle announces the fact, from which the name of the device is derived—the "Whistler." (The Automatic Safety Tire Valve Corp., 1765 Broadway, New York City.)



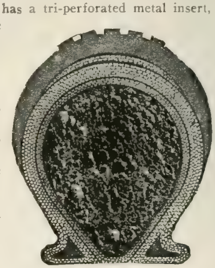
"WHISTLER" TIRE VALVE.

VALVES AND SQUAWKER ENDS FOR TOY BALLOONS.

Two new valves for toy balloons, on which applications for patents have been made, consist in the main of perforated metal caps, within which are positioned disks of paper. One has three inward-turning tabs, enclosing two disks. (E. J. Dunbar Co., 28 West 22d street, New York City.) The other has a tri-perforated metal insert, enclosing a single disk. (Howe Baumann Balloon Co., 187 Murray street, New York City.)

New squawker ends for toy balloons, turned from wood, slightly ribbed for ornament, and varnished lightly, include two general forms. One has a simple flange over which to fasten the balloon and the other, in addition to the flange, has a groove in which the fastening may lie. (Novelty Turning Co., Norway, Me.)

"PARCO" INNER TIRE.



"PARCO" INNER TIRE.

The inner tire shown here is of sponge rubber to replace the usual pneumatic tube. In this case it is shaped and enclosed in fabric. The "Parco" inner tire comes in different sizes to fit all makes of standard size casings. (The Pan-American Rubber Co., Watertown, Wisconsin.)

Activities of The Rubber Association of America.

ASSOCIATION MEETINGS.

The regular monthly meetings of the Executive Committees of the Foreign Trade Division, Mechanical Rubber Goods Division, Tire Manufacturers' Division and the Industrial Relations Committee were held during February, but the matters handled were of a routine nature.

TRAFFIC COMMITTEE.

The Traffic Committee is handling with the United States Railroad Administration several matters of importance to the industry, and particularly the application to the Consolidated Classification Committee at Chicago for reduced carload ratings on guayule rubber and the less carload and carload rates on rubber compounds. The Traffic Committee was given a special hearing at Chicago on Friday, February 20, and a favorable decision is expected.

There is now pending before the same committee an application for a reduction from one and one-half times first class to first class on pneumatic tires in less carloads on all kinds of packages, which is a very important subject to the tire manufacturing industry. The application is predicated to a certain extent upon the greatly increased use of paper for the wrapping of tires.

An application is now before the Western Classification Committee at Chicago for a reduction in the ratings on crude rubber from first class L. C. L. to second-class, and from second-class C. L. to fourth class.

An application to the Consolidated Classification Committee is being prepared for the establishment of a rule permitting the mixing of mechanical rubber goods and other general lines of rubber goods in carloads, on the basis of third-class, carload minimum weight thirty thousand pounds. If this application is granted it will have the effect of permitting jobbers to secure complete stocks of goods at a considerable reduction in the present rate and will enable them to order more advantageously.

A recent accomplishment of the Traffic Committee was to secure the adoption in the Virginia State Classification of a provision for the acceptance of pneumatic tires in wrapped bales or bundles. Heretofore the classification was restricted to tires when shipped in crates.

An application will be submitted to the Consolidated Classification Committee for a more flexible provision in the specifications for rubber hose, which will not be so restrictive as to the kind of paper to be used for wrapping hose.

There will be filed shortly with the State Public Utilities Commission of Illinois an application for a reduction in the carload rating on rubber footwear for movement between points in the State of Illinois or points governed by the Illinois State Classification. The present classification provides for first class on this commodity in any quantity and the application asks for a reduction in carload rates to second class minimum, carload weight twenty thousand pounds, the same as applicable in intrastate movements.

ELECTION OF MEMBERS.

The following new members of the Association were elected during the last few weeks:

FIRM MEMBERS.

Ames Holden Tire Co., Limited, Montreal, Quebec, Canada. Firm representative, Talmon H. Rieder.

Emery Manufacturing Co., 43 Main street, Bradford, Pennsylvania. Firm representative, W. A. McCafferty.

Rotary Tire & Rubber Co., Zanesville, Ohio. Firm representative, Edward O. Sterns.

Universal Tire & Rubber Co., San Francisco, California. Firm representative, George M. Stevens.

Duffy & Sears, 133 Front street, New York City. Firm representative, Stephen H. Sears.

Thornett & Fehr, Inc., 66 Broadway, New York City. Firm representative, Henry G. Perry.

Syracuse Rubber Co., Inc., Syracuse, New York. Firm representative, G. R. Loggie.

Trent Rubber Co., Trenton, New Jersey. Firm representative, Henry A. Ludeke.

Hardy & MacArthur, 82 Beaver street, New York City. Firm representative, R. S. Hardy.

Parker Tire & Rubber Co., Indianapolis, Indiana. Firm representative, Paul P. Parker.

Osborn Engineering Co., Cleveland, Ohio. Firm representative, B. L. Green.

ASSOCIATE MEMBERS.

Herbert L. Baxter, Hood Rubber Co.
Robert L. Tonner, Hood Rubber Co.
Robert Muir, Hood Rubber Co.
Robert S. Quinby, Hood Rubber Co.
Edmund S. Kochersperger, Hood Rubber Co.
W. B. Wiegand, Ames Holden Tire Co., Limited.
Claude M. Butler, Syracuse Rubber Co.
William E. Greer, Syracuse Rubber Co.

STANDING COMMITTEES FOR 1920-1921.

NOMINATING COMMITTEE.

The following committees have been appointed by the Executive Committee of the Association:

Harvey S. Firestone, Firestone Tire & Rubber Co.
George B. Hodgman, Hodgman Rubber Co.
Bertram G. Work, The B. F. Goodrich Co.
Frederic C. Hood, Hood Rubber Co.
Henry C. Pearson, The India Rubber World.

SPECIAL JOINT EXCISE TAX COMMITTEE.

Charles Neave, chairman.
Kennedy M. Thompson, United States Rubber Co.
F. C. VanCleef, The B. F. Goodrich Co.
Bernard M. Robinson, Firestone Tire & Rubber Co.
C. L. Landon, The Goodyear Tire & Rubber Co.
W. B. Stratton, The Fisk Rubber Co.
J. C. Weston, Ajax Rubber Co., Inc.
F. I. Reynolds, Empire Rubber & Tire Corp.
A. A. Garthwaite, Lee Rubber & Tire Co.
W. E. Pouse, General Tire & Rubber Co.
E. S. Hochersperger, Hood Tire Co.
Herbert H. Maas, Ajax Rubber Co., Inc.

STATISTICAL COMMITTEE.

R. S. Butler, United States Rubber Co.
W. C. Arthur, The B. F. Goodrich Co.
E. M. Bogardus, The Fisk Rubber Co.

LEGISLATIVE COMMITTEE.

Charles Neave, chairman, general counsel of The Rubber Association of America, Inc.
F. C. Van Cleef, The B. F. Goodrich Co.
Ernest Hopkinson, United States Rubber Co.

AUDITING COMMITTEE.

F. A. Seaman, Kelly-Springfield Tire Co.
W. J. Kelly, Poel & Kelly.

ARBITRATION COMMITTEE.

Horace DeLisser, chairman, Ajax Rubber Co., Inc.
Andrew H. Brown, Meyer & Brown, Inc.

George A. Ludington, The Fisk Rubber Co.
Van R. Cartmell, Kelly-Springfield Tire Co.
A. B. Jones, The B. F. Goodrich Co.
J. T. Johnstone, J. T. Johnstone & Co., Inc.
W. T. Baird, Rubber Trading Co.
Homer E. Sawyer, ex-officio, United States Rubber Co.

BANQUET COMMITTEE.

Horace DeLisser, chairman, Ajax Rubber Co., Inc.
A. W. Warren, Hodgman Rubber Co.
C. W. McLaughlin, Mohawk Rubber Co.

OUTING COMMITTEE.

A. H. Brown, chairman, Meyer & Brown, Inc.
G. A. Ludington, The Fisk Rubber Co.
W. O'Neil, General Tire & Rubber Co.

SPECIAL COMMITTEE ON UNIFORM CRUDE RUBBER CONTRACT AND NOMENCLATURE.

Col. H. Stuart Hotchkiss, chairman, United States Rubber Plantations, Inc.
W. E. Bruyn, L. Littlejohn & Co., Inc.
George B. Hodgman, Hodgman Rubber Co.
Frederic C. Hood, Hood Rubber Co.
W. J. Kelly, Poel & Kelly.
Paul W. Litchfield, The Goodyear Tire & Rubber Co.
Charles T. Wilson, Charles T. Wilson Co., Inc.
Homer E. Sawyer, ex-officio, United States Rubber Co.

COMMITTEE ON RUBBER AND KINDRED PRODUCTS.

Charles T. Wilson, Charles T. Wilson Co., Inc.
George B. Hodgman, Hodgman Rubber Co.
Homer E. Sawyer, United States Rubber Co.
Bertram G. Work, The B. F. Goodrich Co.
Col. H. Stuart Hotchkiss, United States Rubber Plantations, Inc.
W. J. Kelly, Poel & Kelly.
E. H. Huxley, United States Rubber Export Co., Limited.
E. H. Broadwell, The Fisk Rubber Co.
W. E. Bruyn, L. Littlejohn & Co., Inc.

INDUSTRIAL RELATIONS COMMITTEE.

NEW YORK, FEBRUARY 18, 1920.

To firm and affiliated members:

Referring to our two letters of December 26, respecting the Industrial Relations Committee, particularly our letter asking information respecting industrial relations organizations now functioning in the organizations of all members:

The replies received to our inquiry were very gratifying and indicate clearly to your committee that there is a real opportunity in the industry for cooperative work of this nature and particularly for a medium through which ideas may be exchanged, information given respecting new developments, and assistance offered and supplied wherever required.

The interest in this work indicated by communications received in response to our letter of inquiry prompts your committee to make a further statement of purpose with respect to its work, and to adopt working principles that shall constantly remind the committee and members of the high standard we hope to attain.

As representatives of the rubber industry of the United States and Canada, are we sure, in so far as our relations with our employes are concerned, that our house is in order?

The rubber industry to-day ranks among the largest industries in the country and its place in industrial life is becoming more important each year. Your association wishes to cooperate with you in adopting industrial relations policies that will make the rubber industry the best in the country for all those whose livelihood depends upon it. This large and rapidly growing industry may well bend its efforts toward working out the proper relations between employer and employe with happiness and contentment of worker and management as the outstanding objective. If such a condition is created in our industry it will be a very positive factor in removing causes which result in industrial unrest throughout the whole country and will set a very wholesome example to all other employers.

Let us adopt for our slogan, "THE RUBBER INDUSTRY FOREMOST IN INDUSTRIAL RELATIONS."

The results which we are endeavoring to accomplish can come only through the sincere interest and cooperation of every member of the Rubber Association and it is expected that on such an important matter every member will aid in the work of the Industrial Relations Committee by sending in subjects for discussion, investigation and report.

The maintenance of harmonious and helpful industrial relations ranks in importance with production, distribution, finance and other important functions of management. This is just as true of the small concern as it is of the large one.

Believing in this as a fundamental, your Industrial Relations Committee, desiring to serve your interests, asks you to advise us on the attached return postcard, the name of the official of your organization who supervises or who will supervise this important work, an executive with whom we may correspond on these matters.

A. L. VILES, General Manager.

THE OBITUARY RECORD.

SECRETARY OF AN OLD TRENTON RUBBER COMPANY.

ALFRED WHITEHEAD, secretary and general manager of the Whitehead Brothers Rubber Co., Trenton, New Jersey, died of pneumonia February 3, 1920, at his home, 16 Perdicaris avenue, Trenton, aged 67 years.


ALFRED WHITEHEAD.

Son of the late John and Martha Whitehead, Alfred Whitehead was born in 1853 in the Whitehead farmhouse on Whitehead's Road, where he lived most of his life. His parents died during his childhood and he was brought up by his uncle. Upon completing his elementary education in the country schools, he went to work, at the age of sixteen, in the Whitehead Brothers' rubber factory, then conducted by his uncle and other relatives, but formerly owned by his father. From a minor position he elevated himself to the managership of the plant and was admitted as a member of the firm when the business was incorporated in 1892, later being elected secretary.

He was a director of the Trenton Banking Co., a trustee of the Fourth Presbyterian Church, a member of the advisory board of the Union Industrial Home, and a trustee of the Y. M. C. A. He contributed liberally to charitable institutions and the various war drives held in Trenton. In 1919 he was chairman of the Trenton rubber manufacturers' Salvation Army drive.

In addition to his wife, Pauline W. Whitehead, he is survived by two brothers, Horace and John, and a twin sister, Agnes Whitehead, who is a missionary in India.

Interment was in the family plot in Trenton.

FOUNDER OF THE DIAMOND RUBBER CO.

Although Ohio Columbus Barber is best known as the "Match King" and the chief energies of his very active life were devoted, first to the successful development of his own match factory in Akron, Ohio, and later to the amalgamation of the match business in the United States and the English-speaking world, it was almost inevitable that he should take a deep interest in rubber also, should help develop that industry from almost the beginning of its expansion.

As his name indicates he was an Ohio product, born and reared at East Akron where his father's match factory was situated. He lived there all his life from the year of his birth, 1841, to that of his death, 1920. It was there and in the town he built out of it, Barberton, that he carried on his business and saw develop before his eyes the the amazing growth of the rubber industry in the district around him. He had foresight and shrewdness to take a hand in that and as early as 1893, when the bicycle tire was making its influence felt he induced some

other wealthy men to join with him in starting a company which was named the Diamond Rubber Company, after his Diamond Match Company.

Very soon some Harvard graduates and other Boston young men entered its service and mapped out its work, which became the manufacture of rubber goods of all descriptions. Mr. Barber gave them a free hand, but remained a director of the company to the end, was president for many of the early years and always made his influence felt. That he retained his interest in rubber is shown by his becoming a director of the Alkali Rubber Co., the subsidiary formed in 1904 to reclaim rubber. The Diamond Rubber Co. was amalgamated with The B. F. Goodrich Co. in 1912 and Mr. Barber became a director of the latter company also.

After his ostensible retirement from business about ten years ago, he turned to the development of a 2,500 acre farm in his home town, a model experimental farm for all kinds of crops and plants and for the rearing of high bred stock. This farm which is believed to be worth $4,000,000, will go to the Western Reserve University, Cleveland, Ohio. His fortune is estimated at $10,000,000.

The wife to whom Mr. Barber was married in 1866, Laura L. Brown, died many years ago; three years before his death he married Miss Mary Orr, his private secretary. Mr. Barber was a giant in size, over six feet tall, and a picture of health till he fell a victim to influenza.

ASSISTANT SALES MANAGER MILLER RUBBER CO.

William Quigley Cramp, assistant sales manager of The Miller Rubber Co., Akron, Ohio, died suddenly of neuritis January 23, 1920, at the Akron City Hospital, aged 41 years.

William Q. Cramp.

Mr. Cramp was born in Philadelphia, Pennsylvania, October 9, 1878, and on December 30, 1915, married Frances M. Smith, of Buffalo, New York. He had been with the Miller company for over five years, first as a tire salesman in southern territory. His record in this field was so enviable that he was made branch manager at Atlanta, Georgia, and two years ago went to the Akron factory as assistant sales manager, in which position he became one of the most efficient and popular executives of the company. Held in high regard by his associates, his loss is keenly felt. Funeral services were held at the family residence, 491 North Howard street, January 26, and interment was in a vault at Glendale Cemetery.

Mr. Cramp is survived by his wife, Frances M. Cramp; his parents, Mr. and Mrs. Harry A. Cramp, Philadelphia, Pennsylvania; two sisters, Mrs. Thomas Patten and Miss Elsa Cramp, of Philadelphia, and a brother, Howard S. Cramp, Richmond, Virginia. He was a member of the Buffalo, New York, Commandery, Knights Templars.

South Africa in 1918 imported $2,112,718 worth of rubber goods, including tires, of which the United Kingdom's share was $1,283,476 and that of the United States was $589,090.

RUBBER TRADE INQUIRIES.

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

(776.) A manufacturing concern requests information as to where it can purchase lead oleate.

(777.) An inquiry has been received for the addresses of manufacturers of machinery for making dress shields of rubber without the use of cloth.

(778.) A request has been received for the addresses of dealers in benzo-hydro.

(779.) A European manufacturer asks for the address of the manufacturer of the Sarco thermostatic regulator.

(780.) A Canadian concern requests the addresses of manufacturers of or jobbers in ear drums for use in swimming.

(781.) Inquiry is made for the address of the manufacturer of the "E. Z. Walk" and "Slipknot" insoles.

(782.) A subscriber requests the addresses of manufacturers of spreaders for valves for inner tubes.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Requests for each address should be on a separate sheet, and state number.

DISTRICT OFFICES.	COOPERATIVE OFFICES.
New York: 734 Customhouse.	Cleveland: Chamber of Commerce.
Boston: 1801 Customhouse.	Cincinnati: Chamber of Commerce; General Freight Agent, Southern Railway, 96 Ingalls Building.
Chicago: 504 Federal Building.	Los Angeles: Chamber of Commerce.
St. Louis: 402 Third National Bank Building.	Philadelphia: Chamber of Commerce.
New Orleans: 1020 Hibernia Bank Building.	Portland, Oregon: Chamber of Commerce.
San Francisco: 307 Customhouse.	Dayton, Ohio: Dayton Chamber of Commerce.
Seattle: 848 Henry Building.	

(31,841.) Importer in Brazil desires to secure agencies for and to purchase caoutchouc direct. Correspondence in French or Portuguese.

(31,843.) A firm in Sweden wishes an agency for the sale of inner tubes for bicycles.

(31,849.) A firm in England desires to purchase dressing combs of vulcanite, chiefly 7, 7½ and 8 inches long. Quote f. o. b. English port or f. o. b. New York.

(31,896.) A firm in Mexico wishes to purchase white canvas rubber-soled tennis shoes. Quotations c. i. f. city of Mexico or f. o. b. shipping point. Cash against documents.

(31,916.) A firm in Mexico desires to purchase tires. Quote f. o. b. shipping point.

(31,928.) A firm in Spain wishes an agency on commission for the sale of rubber overshoes and rubber goods. Quote c. i. f. Spanish port. Correspondence in Spanish.

(31,939.) A merchant in Spain wishes to secure an agency to sell rubber raincoats on commission. Quote c. i. f. Spanish port. Correspondence in Spanish.

(31,943.) A firm in Norway wishes to purchase automobile accessories, rubber, and rubber goods. Quote c. i. f. Norwegian port. Payment through banks in Norway and New York.

(31,954.) Agency desired by a firm in Holland for the sale of motorcycle and bicycle tires and tubes. Quote f. o. b. New York. Cash against documents.

(31,965.) A firm in Norway desires agency for sale of rubber, rubber goods, and kindred lines. Quote c. i. f. Norwegian port. Payment through banks in Norway or New York.

(31,995.) A firm in Brazil wishes to represent manufacturers of rubber tubes and tires.

(32,016.) Importer in Belgium wishes an agency for bicycles and tires. Payment two-thirds cash with order, balance upon receipt of goods. Correspondence and catalogs in French.

(32,042.) Commercial agent from Bulgaria wishes to secure an agency for belting and rubber shoes.

(32,044.) A merchant in India desires to secure an agency for motor accessories, tubes and tires. Quote f. o. b. Bombay. Payment through bank in Bombay.

(32,050.) A man in France wishes an agency for the sale of motor tires and tubes and all articles for automobile and pneumatic trade. Quotations c. i. f. Bordeaux. Correspondence may be in English.

(32.059.) Agent in South Africa wishes to secure agency for rubber soles and heels; either one or two-piece.

NEW TRADE PUBLICATIONS.

The Hooven, Owens, Rentschler Co. of Hamilton, Ohio, which for nearly forty years has been installing its Hamilton Corliss engines in power plants throughout the country, has issued a striking folder describing its sugar mill machinery.

The Apsley Rubber Co., Hudson, Massachusetts, is mailing to the trade a handsome 80-page catalog of its extensive lines of rubber footwear for the year 1920. Rubbers, arctics, and rubber boots and shoes of many styles are shown, including first- and second-grade brands, an extra quality brand, and the special wear-resisting "Rock-Hill" line.

T. W. Morris, 3304 Warren Avenue, Chicago, Illinois, has published a well illustrated 26-page brochure describing and containing operating instructions for his automatic trimming machines for heels, soles, mechanical goods, plumbers' supplies, etc., also his water bottle and fountain syringe machine and patent cutters. These trimmers have already been described in The India Rubber World.

"Facts About Pneumatic Truck Tires" is a large and interestingly illustrated brochure of 48 pages, issued by the United States Tire Co., New York City, to tell by word and picture about the use of nobby cord tires throughout the country for a great variety of purposes and under the most trying conditions. Much useful information is presented and the practicability of pneumatic tires for heavy commercial vehicles is amply shown.

"Things That Interest Firestone Shareholders" is the title of a handsome 16-page brochure, bound in boards, which outlines the rubber situation and the tire demand in America and presents the outstanding features of the accomplishments, future plans, plant enlargements, and organization of the Firestone Tire & Rubber Co.

The Eagle Rubber Co., Ashland, Ohio, manufacturers of toy balloons and novelties, has issued a new catalog, illustrating and describing its complete line of toy balloons. This is an especially attractive catalog with an appropriate cover design.

The Goodyear Tire & Rubber Co., Akron, Ohio, has published an attractive 84-page booklet telling the history of the industrial representation plan which was inaugurated in its factory in April, 1919, and is said to be functioning successfully. The plan or constitution of the Council of Industrial Relations, as it is called, is given in full, indicating that the assembly is based on the plan of the United States Government, with a Senate and House of Representatives as legislative bodies, the factory manager holding the executive position corresponding to the President.

Following an account of the election of factory representatives with specimen posters, ballots and the actual result of the polling, there is a section devoted to the assembly as now constituted with portraits and biographical sketches of all men holding office. It is a booklet that will be read with interest by all students of industrial relations.

"Automobile Racing Season, 1919," is the title of a handsome 48-page, profusely illustrated booklet dedicated to the drivers of racing cars, who have contributed the valuable lessons of the speedways to the advancement of automobile and tire development. Published by The Goodyear Tire & Rubber Co., Akron, Ohio, and intended primarily to show the popularity of Goodyear cord tires among the racing fraternity, it also contains much general information of interest regarding the development of automobile racing, its place in automobile development, racing tires, how races are timed, the pit and tire service rendered to each car, and the principal racing records of the season.

THE EDITOR'S BOOK TABLE.

"CEYLON RUBBER PLANTER'S MANUAL." By R. Garnier. The Times of Ceylon Co., Limited, Colombo, Ceylon. (Small quarto, 7¾ by 6¼ inches, 206 +15.8 pages, illustrated.)

A thoroughly technical and practical hand-book designed for planters in Ceylon, but, with certain modifications, useful to planters in Southern India and Malaya, wherever the conditions of climate and soil are similar. The author begins by clearing the ground for rubber cultivation; he then examines the soil, fertilizes it, plants the trees, and nurses them to tapping age. He describes the methods of tapping and the diseases to which plants are subject, then turns to "manufacturing" and the factory. These are the local terms for preparing the rubber for market, and for the buildings where the smoking and packing of the crude rubber are done.

The latter half of the book is taken up with provisions for the coolie labor employed, the housing, sanitation, medical care of the laborers, and with architectural plans for the many buildings required. At the end are interesting and instructive statistical tables of the yearly cost of running a large plantation, with detailed lists of expenditures. It teaches the Ceylon planter all that a book can tell him, and will be helpful to planters in neighboring lands.

"THE FINANCIER RUBBER SHARE HAND BOOK," SIXTEENTH edition. December, 1919. The Financier and Bullionist, Limited, London. (Cloth, octavo, 954 pages.)

This useful and convenient annual contains detailed information regarding the British stock companies that own rubber plantations in any part of the world and whose shares are dealt with in the London rubber market. Compact data will be found regarding capital, officers, business addresses, financial status, dividends, the acreage of the plantations, the crops, yield prices and so forth. In the introduction E. L. Killick, the rubber expert of the Financier, gives his views about the immediate future of rubber production.

"HENDRICKS' COMMERCIAL REGISTER OF THE UNITED STATES for Buyers and Sellers." S. E. Hendricks & Co., New York City. (2703 pages.)

The 28th annual edition of this work deals as usual with both raw materials and finished products of all industries, electrical, engineering, chemical, steel and so forth, including rubber. A new method of exterior indexing by coloring has been added. A "trades index" of 162 pages, with cross references, is followed by a classified trades list of 1813 pages, containing over 18,000 different products. After this come the names and addresses of manufacturers, 216 pages, an alphabetical index of 487 pages and an index of advertisers. It has been brought up to date in every respect and is an invaluable work for sales and purchasing departments in all business houses.

Index to "Rubber Machinery" will be sent free upon request.

CONDAMINE, THE POPULARIST OF INDIA RUBBER.

How INDIA RUBBER was made known to Europe by Charles Marie de La Condamine, of the Academy of Sciences, and later of the French Academy is told very entertainingly by André Dubosc in his *"Histoire du Caoutchouc."* La Condamine was a typical product of the eighteenth century; a thorough Parisian, born of a commercial family that had been ennobled because it was in the Government employ. He left school at seventeen to enlist in the army, where he distinguished himself by foolhardy valor, but when peace came he threw up his commission and became a literary man about town. He showed the hereditary business sense and ability to push his way socially; he frequented the salons of literary ladies, could work off clever verse, and was interested in all scientific novelties. He dabbled in chemistry, in mathematics and in astronomy; he was a friend of Voltaire, and of most of the prominent literary Frenchmen of his time, He lived this life of fashion until he was thirty-four, and indulged in an adventurous journey to the Orient, spending a year in Constantinople.

A scientific quarrel as to whether the earth was flat or projected at the poles, resulted in two French expeditions setting out to measure the degrees of longitude, one to Lapland, the other to some place near the equator. La Condamine joined the latter expedition, which picked out Ecuador, then a portion of Peru, as the scene of its activity. The men in charge kept quarrelling, and La Condamine left the others at Playa del Oro to make his way to Quito alone. He had a hard time on his journey along the Andes and reached his destination a month after the rest of the expedition; but he was a good botanist and he kept his eyes open, and on reaching Quito the first thing he did was to send to the Academy of Sciences "some rolls of a blackish, resinous material" which he had gathered in the forests; namely, caoutchouc. This was in 1736. The expedition stayed on for several years measuring the meridian, constantly quarrelling among themselves and being interfered with by the Spanish Viceroy.

CHARLES DE LA CONDAMINE.
(1701-1775.)

La Condamine in writing home explained that this liquid flowed out of a tree, *Hevé*, after a single incision, milk-white and gradually hardening and blackening in the air. The natives made torches of it; they spread the liquid on cloth and used it as we use waxed cloth. Along the Amazon the Indians made boots of it which kept out the water; they put it around molds shaped like bottles, and when the gum had hardened they broke the mold, producing a light, unbreakable bottle that would hold any liquid. He set to work himself and made waterproof cloths, and also a splendid rubber case for his quadrant. He noted too, that the natives made small bottles of the rubber which they filled with hot water and used as syringes; they in consequence, called the tree, *seringueira*.

By September, 1742, after he had made important discoveries in physics and mathematics, he decided that his work was done and that he would make his way down the Amazon to the French settlement at Cayenne, a journey of 2,000 miles in nearly unexplored regions. He made the journey alone, with only native attendants and reached Guiana in May, 1743. On his trip he had plenty of opportunities of examining the manner in which the rubber grew and the natives utilized the rubber. As France was at war with England he was obliged to wait two years at Cayenne before returning home, but he reached La Rochelle at last on March 7, 1745. He returned to his literary pursuits and told in the salons the story of his adventures and the wonderful qualities of the rubber which he had found, specimens of which he exhibited. Paris of the eighteenth century, however, did not take the discovery any more seriously than it did the beginnings of modern science, and it was reserved to Hancock and Goodyear in the following century to break the way for the modern uses of rubber.

In the five years following his return La Condamine wrote six big volumes, and, despite his social activities and his literary quarrels, kept up his interest in rubber. His friend Fresneau found the rubber tree in Guiana and wrote to him the description of the native method of gathering it, smoking it and using it. He and the French chemists who examined the new substance reached conclusions that are startlingly similar in many points to those reached by modern rubber chemists. Fresneau, for instance, thought it was a kind of condensed resinous oil; the name now used is polyterpene. To prevent it from sticking he used Spanish white, ashes or dust.

La Condamine induced other explorers to search for rubber and learned before he died in 1775 that it had been found in the Isle de France and in Madagascar. Nevertheless, the only practical commercial use found for the caoutchouc in that century was as an eraser of pencil marks, which led to Priestley's christening it by the name it has retained in English, "india rubber."

NEW INCORPORATIONS.

Accurate Cover Co., Inc., February 5, 1920 (New York), $50,000. R. M. and D. Coen, G. C. Woolf—all of 373 Canal street, New York City. To deal in rubberized fabrics, etc.

Associated Tire Corp., The, December 15, 1919 (Massachusetts), $60,000. H. L. Michaels, H. C. Cashman, W. Hartstone—all of 40 Court street, Boston, Massachussetts. Principal office, Boston, Massachusetts. To buy, sell, exchange, repair and dispose of rubber, fabric, cord tires and inner tubes

Bell Tyre & Rubber Co., Inc., January 28, 1920 (Virginia), $50,000. R. J. Bell, president; A. R. Hall, vice-president; H. W. Powers, secretary; T. Bell, treasurer. Principal office, Richmond, Virginia. To deal in automobile acessories.

Bliss Rubber Co., The, November 21, 1919 (Massachusetts), $5,000. J. E. Crowley, 86 Dean road, Brookline; P. C. Adams, 514 Liberty street, South Braintree—both in Massachusetts; A. Bliss, 130 Empire street, Providence, Rhode Island. Principal office, Boston, Massachusetts. To manufacture and deal in tires, tire rims, woven hose and rubber hose.

Boston Sanitary Belt Co., December 16, 1919 (Massachusetts), $50,000. J. W. Barlow, 80 Tyler street, Wollaston; E. M. Sanger, 120 Glenville avenue, Boston; A. C. Gould, 1704 Beacon street, Waban—all in Massachusetts. To manufacture elastic and non-elastic sanitary belts and other sanitary articles.

Central Tire Co., December 2, 1919 (Massachusetts), $25,000. N. T. Balch, 35 Lincoln street, Gardner; R. L. Chandler, 219 Washington street; B. W. Jenkins, 35 Lancaster street—both of Leominster—all in Massachusetts. Principal office, Leominster, Massachusetts. To sell automobile tires, accessories and supplies.

Century Rubber Stamp Works, Inc., January 28, 1920 (New York), $24,000. W. C. Campbell, 410 Fifth avenue; C. Trebing, 900 Hart street, both of Brooklyn, H. Heine, 286 St. Ann's avenue, Bronx—all in New

York. Principal office, 551 Pearl street, New York City. To manufacture rubber stamps, etc.

Cleveland Amalgamated Tire Stores Corp., February 9, 1920 (New York), $20,000. S. and A. Newman, G. J. Bates—all of 1974 Broadway, New York City. To deal in tires, etc.

Crude Rubber Brokerage Co., Inc., January 31, 1920 (New York), $10,000 M. Frankfurter, president; N. Diamond, secretary and treasurer. Principal office, 198 Broadway, New York City. To buy and sell rubber on commission.

Dalff Tire Co., Inc., February 16, 1920 (New York), $50,000. G. Gaschott, 136 Junction avenue, Corona; J. H. Jackson, Scarsdale; M. M. Coughlin, 233 West 121st street, New York City—all in New York. To manufacture tires.

Dawson Tire & Supply Co., January 14, 1920 (New Jersey), $75,000. Albert J. and James J. McGuire, both of 315 Parker street; S. Goldrosen, 24 Farley avenue—all in Newark, New Jersey. Agent in charge, A. J. McGuire. To manufacture buy, sell and deal in tires and automobile accessories.

Esch Manufacturing Corp., December 10, 1919 (New York), $250,000. H. S. Esch, F. F. Fay, W. G. Wahaley all of 27 William street, New York City. To make treads for automobiles.

Fond du Lac Oil & Rubber Corp., January 2, 1920 (Wisconsin), $25,000. D. E. Russell, J. R. Matthews, R. W. Slater. Principal office, Fond du Lac, Wisconsin. To manufacture, buy, sell and deal in rubber tires, tubes, rubber specialities, etc.

Gammeter Co., W. F., The, December 26, 1919 (Ohio), $100,000. W. F. Gammeter, president; L. B. Gammeter, vice-president; F. O. Gammeter, secretary and treasurer; J. M. Gammeter, assistant secretary and production manager; B. I. Gammeter, director. Principal office, Cadiz, Ohio. To manufacture Universal steel calender stock shells, belting shells, tire machine drums, and steel specialties.

Globe Shoe Heel Corp., February 13, 1920 (New York), $6,000. E. Roth, 230 New Main street; S. Roth, 55 Hawthorne avenue; M. Roth, 6 Madison avenue—all of Yonkers, New York. Principal office, Yonkers, New York. To deal in rubber and leather goods.

Hanes Rubber Co. of New York, January 15, 1920 (New York), $10,000. E. O. Machlin, W. T. H. Reilly, R. L. Delisser—all of 135 West 79th street, New York City. To deal in pneumatic tires.

Highland Tire & Rubber Co., November 24, 1919 (Delaware), $200,000. P. P. Reilly, H. D. McCutcheon, J. A. McCullough—all of Pittsburgh, Pennsylvania. To manufacture and sell tires, etc.

Hood Rubber Products Co., Inc., December 29, 1919 (Massachusetts), $1,500,000. F. C. Hood, E. I. Aldrich, both of Brookline; J. D. Colt, C. H. Dwinnell, both of Newton; A. D. Bosson, Boston; H. Gage, Worcester; H. E. Warner, Lincoln—all in Massachusetts. Principal office, Watertown, Massachusetts. To buy, sell and deal in footwear, clothing, tires, tubes and rims.

International I. T. S., December 9, 1919 (Delaware), $1,200,000. T. L. Croteau, P. B. Drew, H. E. Knox all of Wilmington, Delaware. To manufacture rubber products, including heels.

J. W. P. Tire Co., The, July 19, 1919 (Ohio), $5,000. G. L. Webber, president; F. E. Simon, vice-president; W. E. Bennett, secretary and treasurer; F. M. Jessup, general superintendent; R. Sigler, works manager. Principal office, 952 Valley street, Dayton, Ohio. To manufacture tires

McClaren Rubber Tire Co. of New York, Inc., February 17, 1920 (New York), $28,000. W. F. Smith, 644 Riverside Drive; C. E. Lynch, 720 Lexington avenue; A. F. Lynch, 56 East 59th street—all of New York City. To deal in tires.

Manhattan Insulated Wire & Cable Corp., February 20, 1920 (New York), $50,000. S. A. Morrissey, 30 Church street; C. Kurzon, 155 East Houston street, both of New York City; R. H. Cherry, Westfield, New Jersey. To manufacture insulated wire, cable, hose, etc.

Mustor Manufacturing Co., Inc., February 13, 1920 (New York), $50,000. G. F. Muston, 25 Hubbard place, Brooklyn; A. E. Barnes, 2120 Jerome avenue, Bronx; J. W. Mitchell, 1733 Grand Central Terminal, New York City—all in New York. To manufacture rubber and asbestos goods.

Ohio Valley Tire & Rubber Co., The, January 2, 1920 (Ohio), $50,000. A. Stollmaier, president; R. C. Smith, vice-president; J. M. Ferguson, secretary and treasurer; A. Bernstein, general manager; J. Sagmeister, director. Principal office, southeast corner Eighth and Race streets, Cincinnati, Ohio. To distribute various makes of tires and deal in all standard makes.

Otto Tire & Rubber Co., December 13, 1919 (Indiana), $100,000. H. J. Otto, president; G. F. Ahlering, vice-president; A. J. Hoffman, secretary; G. H. Bippus, treasurer; C. E. Hughes, director. Principal office, 208-210 Upper Fifth street, Evansville, Indiana. To distribute Perfection tires, repair and rebuild tires and tubes.

Prudential Rubber & Airless Tire Corp., February 16, 1920 (New York), $25,000. H. Hennig, J. Parrino, J. Di Girolamo—all of Buffalo, New York. Principal office, Buffalo, New York. To manufacture rubber goods, tubes, etc.

Rambler Rubber Corp., December 28, 1919 (Delaware), $50,000. N. N. Kenney, M. Butler, M. M. Lucey—all of Wilmington, Delaware. To deal in automobile tires.

Road Gripper Tire & Rubber Co., November 26, 1919 (Minnesota), $150,000. F. and M. C. Trahms, T. W. and I. M. Bolzendahl—all of Minneapolis, Minnesota. Principal office, St. Paul, Minnesota. To manufacture leather and rubber goods.

Simplicity Valve Co., December 18, 1919 (Massachusetts), $200,000. C. J. Reynolds, 30 Summer street, Melrose; S. L. Reade, 4 Arrow street, Cambridge; C. E. Conant, 140 Mt. Vernon street, Newtonville—all in Massachusetts. Principal office, Boston, Massachusetts. To manufacture and deal in automobile and pneumatic tire equipment of every description.

Stanley Tire & Rubber Corp. of Delaware, December 17, 1919 (Delaware), $250,000. S. B. Howard, G. V. Reilly, R. K. Thistle—all of New York.

Stockwell Rubber Co., Inc., August 20, 1919 (Pennsylvania), $25,000. F. E. Stockwell, president; A. J. Vollrath, vice-president; W. P. Sibley, secretary and treasurer. Principal office, 229 North 12th street, Philadelphia, Pennsylvania. Wholesale distribution.

Traveler Tire Co. of Pittsburgh, January 14, 1920 (Delaware), $100,000. S. D. Townsend, Jr., V. Barsky, G. H. Reed—all of Wilmington, Delaware.

Universal Rubber Products Co., May 26, 1919 (Delaware), $2,000,000. T. L. Croteau, P. B. Drew, C. L. Rimlinger—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture hose, belting, straps, tubes, tires and rubber goods.

Vulcan Rubber Co. of New Jersey, December 11, 1919 (New Jersey), $100,000. E. R. Crow, W. N. Goodrich, both of East Orange; W. E. Dunkinson, Newark—both in New Jersey. Principal office, 232 Halsey street, Newark, New Jersey. Agent in charge, W. E. Dunkinson. To make, purchase, sell and deal in tires and tubes.

Young Rubber Products Co., January 12, 1920 (Delaware), $600,000. To manufacture "Ev-R-Wear" electric rubber patch, etc.

INTERESTING LETTERS FROM OUR READERS.

QUESTIONS OF INTEREST.

To The Editor:

Dear Sir:—As a big holder of rubber growing companies' shares, I follow with interest the rubber trade and have posted to me each month your paper (The India Rubber World) by the International News Agency.

I should esteem it a great favor if you would kindly give me a reply to this letter, and at the same time tell me how I can repay you.

It has recently been stated in the press that the stocks of rubber in America exceed 50,000 tons. Is this correct, do you think?

Further, the English papers estimate that America will take (U. S. A. alone) 360,000 tons of rubber this year, roughly, 50 per cent more than last year. Do you consider this probable?

As a close follower of the market I am convinced that if your demands exceed 240,000 tons the stocks will be reduced so low that by December, 1920, rubber will reach at least 3*s*. 6*d*. to 4*s*. a pound.

Could you state also the number of motor cars registered in the U. S. A. December 31, 1919, including, of course, motor trucks and wagons? Also the number of cars and wagons made during 1919 and the number estimated to be built during 1920.

It would be interesting to know whether you consider that a shortage of rubber is likely in the autumn of this year or early next year.

Englishman.

FINANCES REQUIRED FOR BALATA EXPLOITATIONS.

To The Editor:

Dear Sir:—On my arrival here last month, I saw your balata article in your June issue, having just returned from the Rio Branco district via Manáos, Brazil, after exploring and starting a balata industry. This industry is now well started under the name of Norzagaray & Boyd.

I was the pioneer official (local secretary of the directorate formed in Georgetown, British Guiana) from London sent out by the Consolidated Rubber & Balata Estates, Limited, and left after two years. The C. R. B. E., Limited, took over the grants and balata businesses of Garnetts, Davsons, Downer, McKinnon, Dr. Bovallius and north territories from a "Colonel" Link.

I intend returning to Manáos to do explorations for fibers chiefly, and incidentally balata, if I have capital at my disposal. If there are any live manufacturers in your country who want to carry out explorations and secure balata areas, please let them communicate with me. Agreements must be made and treated according to English laws. The areas just explored are now being transferred to an English combine. I know where there are other reefs, etc. No use opening bank credits in Manáos for the produce. If a large prospecting company is formed, I will take charge of the expedition and the financiers can send their own representative to manage the cash, accounts and correspondence.

In 1918 for end of season, and owing to shortage of bleeders, Norzagaray & Boyd shipped about 16 tons, and during 1919 season it will be between 35 and 40 tons. Bleeders had to be imported and trained. The Peruvians turn out very capable and reliable.

William A. Boyd.

15 Seething Lane, London, E. C. 3.

News of the American Rubber Trade.

DIVIDENDS.

The Amazon Rubber Co., Akron, Ohio, has declared its semi-annual dividend of three and one-half per cent on preferred stock.

The American Chicle Co., New York City, has declared its quarterly dividend of one and one-half per cent, payable April 1 on stock of record March 20, 1920.

The International India Rubber Corp., South Bend, Indiana, has declared the regular annual dividend of seven per cent in cash on the preferred stock for the year 1919 and has also directed a cash distribution out of earnings equal to six per cent on common stock. In addition, the directors have authorized the payment in cash of the entire accumulated dividends on outstanding preferred stocks for the years 1917 and 1918.

The Plymouth Rubber Co., Canton, Massachusetts, has declared its quarterly dividend of one and three quarters per cent, payable March 1 on preferred stock of record February 24, 1920.

The van der Linde Rubber Co., Limited, Toronto, Ontario, has declared its regular semi-annual dividend at seven per cent, payable to shareholders of record January 1, 1920.

The Tyer Rubber Co., Andover, Massachusetts, declared and paid on February 14, 1920, its quarterly dividend of $1.50 per share on preferred stock.

FINANCIAL NOTES.

While the detailed statement of the operations of the United States Rubber Co. for the year 1919 is not yet completed, it is announced that the volume of sales and the net earnings for the past year are the largest in the history of the company. The surplus earnings for the year 1919 will doubtless be ample to cover all dividends paid during the year, including the cash dividends and the common stock dividend of $9,000,000 declared January 8.

At the close of the year the company had no outstanding notes or obligations other than current accounts and acceptances necessary in the conduct of its business. The cash in bank was over $15,000,000 and $2,800,000 of Liberty Bonds were in its treasury.

It is estimated that the very substantial enlargement of the company's tire plants at Detroit, Michigan; Indianapolis, Indiana; Hartford, Connecticut; Providence, Rhode Island, and Kitchener, Ontario, Canada, now in progress will, when completed, more than double the present tire production.

The Portage Rubber Co., Akron and Barberton, Ohio, has offered 5000 shares each of its preferred and ordinary stock to its stockholders at par. Each stockholder could subscribe up to 20 per cent of his holdings, but was obliged to take equal amounts of common and preferred. The option terminated on January 10, 1920.

Sales of The Mason Tire & Rubber Co., Kent, Ohio, for the quarter ended January 31, 1920, amounted to $1,313,927.35, an increase of over 100 per cent over the figures for the same quarter of last year, which were $630,930.16. The Mason factory expects to show more than 100 per cent gain in business for the year. The net profits for the quarter show a handsome increase over those for the same period last year.

The Gillette Rubber Co., Eau Claire, Wisconsin, has issued $750,000, 7 per cent cumulative preferred stock, par value $100. The new capital will provide for expanding both the tire and the raincoat and waterproofing departments. The company began operations in March, 1917, turning out 100 tires a day; its present production is 1000 tires and, when the additions to the plant are completed, will be over 1500 tires a day.

The sales of the B. F. Goodrich Company in 1919 amounted to $142,000,000 and at the present rate will be $200,000,000 for 1920. The common stock paid 6 per cent and the year's earnings show that 24 per cent was earned on it.

A special meeting of the stockholders will be called for March 10, 1920, to consider a plan for financing which will be presented in detail. As part of the plan the directors propose to change the common stock to non-par value shares, in harmony with the action of many of the largest industrial institutions at this time. The stockholders will be asked to increase the number of shares of authorized common stock so as to provide, among other things, for the conversion of the proposed notes. In addition, the directors deemed it advisable to have shares of the new common stock available for purchase by the employes of the company, so that they may participate in the company's prosperity. If the stockholders take the necessary action to authorize the proposed convertible notes, opportunity will be given them, in due course, to subscribe thereto upon favorable terms. The issue has been underwritten by a group of New York bankers.

E. F. Jones, of Elyria, Ohio, formerly identified with the steel industry, has been elected president of The Republic Rubber Corp. to succeed Guy E. Norwood, who has resigned.

At a meeting held February 20, the stockholders voted favorably on the resolution of the directors advising amending the articles of incorporation so as to increase the number of shares of common stock without normal or par value from 650,000 to 1,500,000 shares, and also so as to increase the amount of working capital from $15,750,000 to $20,000,000.

The recommendation of the directors was adopted by the following vote, the respective vote of each class of stock exceeding 60 per cent of such stock; first preferred stock, 42,376 shares, second preferred stock, 15,819 shares and common stock, 269,787 shares. Total 327,982 shares affirmative, none in the negative.

FINANCIAL STATEMENT OF THE CONVERSE RUBBER SHOE CO.

The Converse Rubber Shoe Co., Malden, Massachusetts, has recently issued its annual balance sheet for the year ended December 31, 1919, which shows the following figures adjusted to the sale of a $500,000 preferred stock issue now in the market:

CURRENT ASSETS.		
Cash	$208,402.10	
Accounts receivable	1,261,754.58	
Notes receivable	126,618.31	
Liberty bonds	349,658.06	
Raw material	672,003.51	
Finished goods	1,634,891.00	$4,253,327.56
Investments	$ 37,436.21	
Other accounts receivable	12,995.01	
Plant and equipment	912,929.66	
Auto trucks	15,773.52	
Leases, trademarks, copyrights	255,000.00	
C.R.S. Co. general capital stock	38,300.00	
C.R.S. Co. preferred stock	4,100.00	
Prepaid expense	146,915.89	$1,423,450.29
		$5,676,777.85
CURRENT LIABILITIES.		
Notes payable	$1,456,200.00	
One year coupon notes	500,000.00	
Accounts payable	168,144.91	
Dividend reserve	13,845.12	$2,138,190.03
Preferred stock	2,125,000.00	
General capital stock	375,000.00	
Three year gold coupon notes	285,000.00	
New York reserve	3,819.53	
Tire adjustment reserve	264.27	
Reserve	148,120.49	
Surplus	601,383.53	$3,538,587.82
		$5,676,777.85

The Converse Rubber Shoe Co., Malden, is offering to the

public a $500,000 issue of seven per cent cumulative preferred stock, the par value of the shares being $100. The proceeds of this issue will be used to reduce floating debt and to finance the greatly increased volume, the company's sales having jumped from $977,180 in 1913 to $4,923,296 in 1918, and an estimated total of $5,500,000 for the fiscal year ending April 1, 1920. For the past four years the demand for the company's products has greatly exceeded the supply, and during the past two years alone orders aggregating $2,000,000 were refused.

THE GOODYEAR TIRE & RUBBER CO. STATEMENT.

According to the annual report of The Goodyear Tire & Rubber Co. for the fiscal year ended October 31, 1919, the last year's business has been the largest and most profitable in the history of the organization. Sales were $168,914,982, against $131,247,382 for the preceding year; net profits (subject to Federal tax) were $23,277,245, against $15,388,190 for the preceding year. During the year dividends were paid on the capital stock as follows: first preferred, 7 per cent, $1,664,866; second preferred, 8 per cent, $1,149,074; common, 12 per cent, $2,489,355. In accordance with the articles of incorporation, as amended, capital stock was redeemed during the year as follows: first preferred par value of $609,900 and second preferred $1,318,400. There remains an unappropriated surplus of $33,332,666, subject to Federal taxes for the year.

During the year the authorized preferred and common stock of the company was increased to $100,000,000 each. Of the new preferred stock offered to stockholders and employes, $41,135,900 has been subscribed by 30,409 persons throughout the country, of which amount $7,843,600 was subscribed by 17,407 employes of the company.

The balance sheet as of October 31, 1919, follows:

ASSETS.

Plant, as per books:			
Real estate and buildings	$17,752,994.19		
Machinery and fixtures	17,507,512.49		
			$35,260,506.68
Patents, trade-marks, designs			1.00
Securities owned—other than U. S. Liberty Bonds—book values			4,440,602.69
First preferred stock, purchased and held in treasury, 3,592 shares, par value $359,200			326,993.19
Notes receivable of officers and employes for capital stock, secured by such stock to the par value of $1,621,900			1,324,741.07
Employes' subscriptions for 2nd preferred stock (balance unpaid)			48,661.68
Inventory and current assets:			
Inventory		$35,566,779.06	
Accounts and notes receivable (provision in reserve for doubtful items $231,445.30—see contra)		23,635,353.98	
Advances to agents, salesmen and companies		3,648,895.19	
United States Liberty Bonds	$3,405,800.00		
Less notes payable, secured by same	1,120,000.00		
		2,285,800.00	
Cash on deposit and on hand		10,395,241.32	
			75,532,069.55
Advances to the Goodyear Improvement Co. and to The Goodyear Heights Realty Co.			1,880,328.06
Suspended assets (provision in reserve for doubtful items, $182,076.36—see contra)			182,076.36
Prepaid rentals, interest, insurance, etc.			1,280,851.42
			$120,276,831.70

CAPITAL AND LIABILITIES.

Capital stock (par value $100 per share):			
First preferred (7 per cent cumulative)—			
Authorized and issued	$25,000,000.00		
Less—redeemed	1,826,100.00		
		$23,173,900.00	
Second preferred (8 per cent cumulative):			
Authorized $25,000,000, issued	14,468,700.00		
Reserved for issue to employes on partial payment subscriptions	347,100.00		
	14,815,800.00		
Less redeemed	1,318,400.00		
		13,497,400.00	
Common authorized, $50,000,000 issued		20,757,600.00	
			$57,428,900.00
Current liabilities:			
Purchase accounts and acceptances payable		7,722,740.24	
Sundry other accounts payable		2,766,021.69	
Notes payable		9,500,000.00	
Accrued first preferred dividends		138,738.84	
Second preferred dividends payable November 1, 1919		289,200.66	
Federal income and excess profits taxes to October 31, 1918, balance unpaid		1,368,782.17	
			21,785,483.60
Reserves:			
For doubtful accounts (current)—see contra		231,445.30	
For doubtful accounts (suspended assets)—see contra		182,076.36	
For insurance on branch stocks		103,335.82	
For industrial compensation		38,470.10	
For pensions		100,000.00	
For depreciation of plant		7,074,454.11	
			7,729,781.69
Surplus, subject to federal taxes for the year			33,332,666.41
			$120,276,831.70

Subject to contingent liability for notes receivable discounted, amounting to $8,614,414.82.

STATEMENT OF THE WELLMAN-SEAVER-MORGAN CO.

The Wellman-Seaver-Morgan Co. has reduced borrowed capital from $1,200,000 to $425,000 and regularly paid quarterly dividends, besides the deferred dividends on the preferred stock for the years 1917 and 1918. The original issue of preferred stock has been redeemed and cancelled, and there is but one class of preferred stock outstanding. The working capital is ample for anticipated requirements. The condensed balance sheet as of December 31, 1919, follows:

ASSETS.

Current:	
Cash	$305,978.14
United States Liberty Bonds	188,541.79
Notes receivable	1,187,897.24
Accounts receivable	942,021.92
Inventory	529,953.46
Uncompleted contracts	1,529,327.24
Other assets	74,746.20
Permanent land, buildings and machinery	3,143,317.23
Patents	264,512.76
Deferred	31,708.85
	$8,197,914.71

LIABILITIES

Current:	
Notes payable	$425,000.00
Accounts payable	712,955.44
Dividends payable January 2, 1920	81,850.00
Accrued	37,718.50
Advances on contracts	453,554.62
Reserves	274,722.29
Capital stock—preferred	2,500,000.00
Capital stock—common	2,540,000.00
Surplus	1,172,113.86
	$8,197,914.71

HOOD RUBBER PRODUCTS CO., INC.

The Hood Rubber Co., Watertown, Massachusetts, which has formerly sold its products, both footwear and tires, direct to manufacturers, dealers and jobbers and through subsidiary selling companies, has organized a new corporation, the Hood Rubber Products Co., Inc., under the laws of Massachusetts, with a capital of $1,000,000 preferred and $500,000 common stock, to take over the sale and distribution of its products. To the new company will be transferred all the business and assets of the former subsidiaries, namely: Hood Tire Co., Inc., Watertown, Massachusetts; Pilgrim Rubber Footwear Co., Boston, Massachusetts; Pioneer Rubber Shoe Co., Minneapolis, Minnesota; Dearborn Rubber Co., Chicago, Illinois; Iowa Rubber Shoe Co., Davenport, Iowa; Southwest Rubber Footwear Co., Kansas City, Missouri; Capital City Rubber Co., Columbus, Ohio; Grand Rapids Shoe & Rubber Co., Grand Rapids, Michigan.

The Hood Rubber Co. retains all the common stock of the new company, and until February 3, 1920, offered the preferred stock first to its own stockholders. The directors of the Hood Rubber Products Co. Inc., include the directors of the Hood Rubber Co. and the officers are: president, Frederic C. Hood; vice-president, Francis S. Dane and Edward I. Aldrich; treasurer, Erle A. Bishop; assistant treasurers, Francis S. Dane and Thomas H. Burton; general manager, William W. Duncan. The sales for 1918 and 1919 amounted to $25,000,000 each year and a substantial increase on this sum is expected in 1920.

PERSONAL MENTION.

W. H. Hurley has been promoted from the position of western district manager to that of eastern district manager of The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio, with headquarters in New York City.

John D. Olwell has been elected president of the Akron Overland Tire Co., Inc., formerly the Akron Tire Co., Inc., Long Island City, New York.

H. W. Harwell has been placed in charge of the New York general sales office of the Henderson Tire & Rubber Co., Inc., Columbus, Ohio, with headquarters at 40 Exchange Place, New York City.

William B. Clowar, for several years superintendent of the hose department of the New York Rubber Co. at Beacon, New York, recently resigned that position to become superintendent of the Auto Topping Department of the Vulcan Proofing Co., Dean street plant, Brooklyn, New York.

Casper Smith, president of the Smith Chemical & Color Co., Inc., 116 Nassau street, New York City, has just returned from a two months' business trip throughout the United States. He reports business brisk, particularly in the West and Middle West.

Clarence F. Brown has been appointed director of advertising of E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware, succeeding George Frank Lord, resigned.

The following promotions are announced by the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania: Alexander Taylor from manager of works to assistant to vice-president, in charge of production, stocks, and stores in all plants; R. L. Wilson from general superintendent to works manager, East Pittsburgh; E. R. Norris, director of works equipment, in charge of machinery, tools, and methods in the various plants; C. B. Auel, manager of employes' service department; G. M. Eaton, chief mechanical engineer; C. W. Johnson and H. W. Cope, assistant directors of engineering; C. H. Champlain and E. S. McClelland, assistant works managers; John E. Bonham, assistant to works manager; E. S. Brandt, supervisor of equipment and methods; managers of engineering departments—A. M. Dudley, automobile department; R. P. Jackson, material and process; F. E. Wynne, railway equipment department; and G. H. Garcelon, small motor.

Arthur E. Allen has been appointed district manager, at New York City, for the Westinghouse Electric & Manufacturing Co. He succeeds Edward D. Kilburn, who has been made vice-president and general manager of the Westinghouse Electric International Co.

Mr. Allen entered the service of the Westinghouse company in 1902. He is a native of Toronto, Canada, and served with the Canadian forces during the war, being commissioned a second lieutenant in the Royal Flying Corps.

Sidney Dillingham, Akron representative of Duffy & Sears, crude rubber brokers, New York City, began his rubber career in 1915 in the Federated Malay States where he spent one and one-half years with a European plantation company. He joined the Firestone Tire & Rubber Co., Singapore, Straits Settlements, Ltd., Singapore, Straits Settlements, in 1917 and remained there until 1918, acting in the capacity of rubber inspector and buyer. He left Singapore in 1918, coming to America where he enrolled in an officers' training school. After the armistice he entered the crude rubber department of the Firestone Tire & Rubber Co., Akron, Ohio, recently resigning to accept his present position.

Dr. A. Pirelli has been elected president of the Italian *Societa di Chimica Industriale* (Society of Chemical Industry) at Milan.

James Gustavus Whiteley, Belgian Consul at Baltimore, Maryland, has been appointed special representative in the United States for the Belgian Committee that is preparing, under the patronage of King Albert, the festival at Antwerp late this spring, to celebrate the Olympian Games.

H. H. Coleman, president of the Bergougnan Rubber Corp., Trenton, New Jersey, sailed for Europe on the steamer *La Lorraine*, January 20, to attend the annual Bergougnan convention at Clermont-Ferrand, France.

NEW JERSEY ZINC CO., INC., TO INCREASE PRODUCTION OF ZINC OXIDE AND LITHOPONE.

The New Jersey Zinc Co. announces that it will construct additional zinc oxide and lithopone plants to meet the growing demand for these products. Work will be started at once in Colorado and Pennsylvania. This company, said to be the oldest and largest zinc company in the United States, was organized in 1848 and includes among its properties the famous Franklin, New Jersey, mine which produces a pure zinc ore. The company is now operating zinc oxide, lithopone and slab zinc plants in Pennsylvania, Virginia, Illinois, Wisconsin, Kansas and Oklahoma. It has warehouses for its products in Brooklyn, Newark, Philadelphia, Pittsburgh, Cleveland, Chicago, Los Angeles, and San Francisco and intends to establish others. Its headquarters are in New York City and it has sales offices in Chicago and Pittsburgh.

With the manufacturing plants now in operation and those about to be constructed the company will be in a position to serve promptly and economically its trade throughout the country.

LINCOLN HIGHWAY ASSOCIATION ELECTS OFFICERS.

At the annual meeting of the Lincoln Highway Association, held recently in Detroit, Michigan, F. A. Seiberling, president of The Goodyear Tire & Rubber Co., Akron, Ohio, who has been president of the association for the past two years, refused to accept a third term, and Colonel Henry B. Joy, formerly president of the Packard Motor Car Co., who was the first president of the organization, was again unanimously elected president. Mr. Seiberling continues to be identified with the work of the association as one of its vice-presidents and a member of its executive committee.

The tire industry is further represented by J. Newton Gunn, president of the United States Tire Co., New York City, who was elected to the board of directors. Probably not less than $12,000,000 will be expended on the improvement of the Lincoln Highway in 1920, and the permanent marking of the route from Omaha to New York will be completed.

EASTERN AND SOUTHERN NOTES.

The Firestone Tire & Rubber Co., Akron, Ohio, has made the following changes in the personnel of its eastern and southern branches: W. M. MacNichol, manager of Baltimore, Maryland branch, succeeding B. R. Leisure, promoted to be district manager, with headquarters in Philadelphia, Pennsylvania; E. D. Manley, manager of Washington, D. C., branch, succeeding W. M. MacNichol; L. L. Heidacher, manager of Memphis, Tennessee, branch, succeeding G. K. Meeks, transferred.

The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio, has promoted B. P. Davis from the ranks of its salesmen to be manager of the McGraw branch at Memphis, Tennessee.

The Kokomo Rubber Co., Kokomo, Indiana, has purchased a site in Louisville, Kentucky, for its branch plant established there six months ago. It will build a two-story and basement structure, of which the lower floor will be occupied by the retail sales force.

The Katzenbach & Bullock Co., New York City, manufacturer and importers of chemicals and colors for the rubber trade, has opened a new office at 119 South Fourth street, Philadelphia, in charge of R. M. Smith.

The Stockwell Rubber Co., Inc., 229 North Twelfth street, Philadelphia, Pennsylvania, has been appointed sole agent of the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts.

The Lineatime Manufacturing Co., Inc., Rochester, New York, manufacturer of the "Line-a-Time" copyholder having a number of rubber parts, has increased its capital from $50,000 to $150,000.

The Philadelphia Rubber Works Co., Philadelphia, Pennsylvania, is to erect a $4,000,000 reclaiming plant at Buffalo, New York, where it has purchased 97 acres of land on the Niagara river road. Construction has already begun on the first unit, which will have a capacity of 2,000,000 pounds per month finished weight of reclaimed rubber. The reasons given for going to Buffalo are the land available and the proximity to the water power of Niagara Falls. The company's plant at Akron will be maintained, the one at Buffalo being intended to take care of future expansion.

Tyrus Cobb, the baseball player, has been signed as a salesman for the Ty Cobb-Bill Sanford Tire Co., of Augusta, Georgia, distributors of Goodrich tires in the South.

The Courier Rubber Co., Inc., 150 Nassau street, New York City, has been established to push the sale of the Courier red floating inner tube. The officers are Robert E. Clift and William D. Laurie, president and vice-president, respectively, both formerly with Frazar & Co., 30 Church street, New York City, and Paul Cooksey, secretary and treasurer.

The Overman Cushion Tire Co., Inc., 250 West 54th street, New York City, will build a two-story addition to its factory, 50 by 138 feet, for use as a machine shop, service station, assembling and painting. It is expected that the new structure will be finished by May 1.

The K., F. & C. Tire & Rubber Corp., Roanoke, Virginia, has recently purchased 15 acres of property, with several buildings of reinforced concrete, at Roanoke, as a unit of its factory for the manufacture of its cord tire, which is neither a solid, pneumatic nor cushion tire, but a built-up tire of rubber, cords and cord fabrics such as are used in pneumatic tires. This was described in The India Rubber World, August 1, 1918. The company has patents in the United States, Great Britain, Canada and the other British colonies, France and Italy, and has applied for patents in other countries. The company expects to install $200,000 worth of machinery during the coming summer.

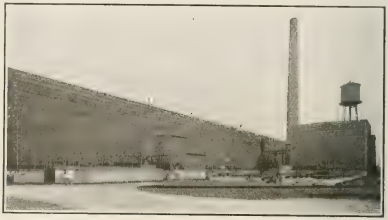
The Pennsylvania Rubber Co., Jeannette, Pennsylvania, has elected the following officers for the ensuing year: directors—Herbert DuPuy, H. Wilfred DuPuy, Charles M. DuPuy, Seneca G. Lewis, and George W. Daum; Herbert DuPuy, chairman of the board; H. Wilfred DuPuy, president; Charles M. DuPuy, vice-president; Seneca G. Lewis, vice-president and general manager; George W. Daum, assistant general manager; A. H. Price, treasurer; George W. Shiveley, secretary; James Q. Goudie, general sales director; C. G. Morrill, assistant treasurer; H. H. Salmon, purchasing agent.

In order to insure the carrying out of plans now under way for expansion in proportion to growth and to stabilize the policies of the company, a definite arrangement was made to retain Mr. Lewis for five years more, he having already completed ten years of service. As heretofore, the business will be built from the inside out and men and women promoted from the ranks when possible. Mr. Lewis is of the opinion that new plants should be built only to take care of the demand for the company's products and not before the business to run them has been obtained.

The Allen Machine Company, of Erie, Pennsylvania, has opened a New York office at 17 West 42nd street in order to care properly for their eastern and export trade. Morris A. Pearson, who is a well known rubber machinery engineer, is in charge.

The Akron Tire Co., Inc., Honeywell street and Skillman avenue, Long Island City, New York, has changed its name to Akron Overland Tire Co. and increased its capital stock $750,000. It was incorporated in October, 1919, under the laws of Delaware, with 100,000 shares of stock without nominal or par value.

The Farrel Foundry & Machine Co., Ansonia, Connecticut, has purchased at Buffalo, New York, where it will establish a new branch, the "Victory" turbine plant of the Bethlehem Shipbuilding Co. at Vulcan avenue and the New York Central railroad, at a cost of $431,000. This includes power plant, office, restaurant, welfare and hospital buildings, in addition to the main building 225 by 700 feet, and 12 acres of land. The company has also acquired 33 additional acres of land for expansion.



Farrel Foundry & Machine Co.'s Buffalo Plant

The Poole Engineering & Machine Co. has removed its general sales office from 50 Church street, New York City, to its works at Baltimore, Maryland, where mail should be directed. It will still maintain a district office at the New York City address, however.

Taintor Trading Co., Inc., 9 State street, New York City, has incorporated to do a general trading business including the importation of chalk, English cliffstone, china clay, etc., under the management of Starr Taintor, president.

The Sinclair Rubber Co., Inc., 1679 Broadway, New York City, incorporated in September, 1919, has a factory at 2864 Webster avenue, where it manufactures a rebuilt tire which is intended to counteract the popular impression that rebuilt tires are unsatisfactory.

H. Schatia & Co., 100 Fifth avenue, New York City, are selling an Australian wool-filled fabric to manufacturers of raincoats in this country. It is of especially shaggy texture of a type current in prevailing English overcoatings and ulster cloths and offers in ten different shades. The manager of the fabrics for rubber clothing department is R. G. Bryant, a son of Geo. C. Bryant, formerly manager of the Chicago Rubber Clothing Co., Racine, Wisconsin, now operating in rubber clothing in Milwaukee under his own name.

RUBBER DIVISION OF THE AMERICAN CHEMICAL SOCIETY.

The Rubber Division of the American Chemical Society will meet in St. Louis, Missouri, April 14-15, and extends an invitation to all rubber chemists and technologists to attend. Since the rubber chemist has ordinarily to deal with technical problems not entirely chemical, much material is usually presented at these meetings which is of general interest. One such item to be discussed at the next meeting is the report of the committee on "Physical Testing."

Authors desiring to submit papers for presentation at the meeting should send the titles of the papers, together with abstracts, to A. H. Smith, Research Laboratory, The Goodyear Tire & Rubber Co., Akron, Ohio, by March 25.

THE RUBBER TRADE IN MASSACHUSETTS.

By Our Regular Correspondent.

BOSTON NOTES.

As a result of the exceptionally severe winter weather and series of blizzards which have visited this section during the past month, instances of profiteering in overshoe sales by retail dealers in the down-town district of Boston have been reported by inspectors for the state commission on necessaries of life, acting on a communication from Thomas J. Boynton, United States district attorney. Taking advantage of the abnormal conditions and a shortage of rubber footwear, some dealers were charging $5.50 or $6 a pair for overshoes that cost only $3.50 a pair. The usual and fair profit on such footwear, the commission asserts, is $1 per pair.

The Firestone "Ship by Truck" movement is being energetically organized and advertised throughout New England, and shippers are invited to make use of the information being compiled by the Firestone Ship by Truck Bureau at 656 Beacon street, Boston. Fourteen routes radiating in all directions from "the Hub" have been scheduled and large space in the local press is being devoted to listing the truck transportation companies operating on the various routes. The Massachusetts routes embrace Lowell, Springfield, Greenfield, Lynn, Brockton, Fall River, Haverhill and Lawrence, Marlboro and Hudson, and Cape Cod points. Other routes are to New York City, Philadelphia, Pennsylvania, Providence, Rhode Island; Manchester, New Hampshire, and Portland, Maine. Every route covers numerous smaller intermediate cities.

The employes' association of the Boston branch of the United States Rubber Co. held a most successful dance at Heineman Academy, Somerville, late in January. Some 400 persons were in attendance, including executives of the company. Novel dance numbers and other unusual features provided special entertainment. The committee in charge included Helen Cullen, Agnes M. Lintaman, Margaret H. O'Brien, Charles P. Abbott, A. A. Lappin and Roger Hewins.

The Hood Tire Sales Co., with stores at 1041 Commonwealth avenue, Boston, and in Watertown, selling Hood tires and tubes exclusively at wholesale and retail, has opened a downtown Boston branch in Park Square at the corner of Church street. Lewis B. Clay is in charge. D. J. MacNichol, president of the company, states that other stores will be opened as suitable locations can be secured.

At the annual meeting of the Franklin Rubber Co., 134 Federal street, Boston, held February 4, the following officers were reelected for the ensuing year: Asa C. Merrill, president; Everett L. Fuller, treasurer; Lorin L. Fuller, assistant treasurer. The company had a very successful year and is anticipating a large increase for 1920.

The Gillette Rubber Co., formerly at 110 Federal street, Boston, has sold its furniture and fixtures and gone out of business.

The recently organized Holland System Trading Corporation, 949 Commonwealth avenue, Boston, has become the exclusive New England distributer for the Overman cushion tire for trucks and is seeking live agents in every city of this territory.

Coburn, Kittredge & Co., 10 State street, Boston, is among the New England investment houses now specializing in rubber company securities.

H. O. Allyn, for several years at the head of the Springfield branch of the Pennsylvania Rubber Co., has been promoted to manager of the Boston branch. Mr. Allyn brings to his larger work long experience in the tire industry and an enviable record of able salesmanship.

The Boston branch of The Fisk Rubber Co. has a new manager in the person of Corliss Wadleigh, who has resigned as manager of the eastern department of the Youngstown, Ohio, organization of the Republic Rubber Corp., to assume his new duties. Mr. Wadleigh originally came from the Knox automobile sales forces, and although young in years is old in tire experience and has a wide acquaintance throughout New England.

L. Arthur Watkins, one of Boston's best known automobile accessory men, has been appointed to the New England district managership of the Globe Rubber Tire Manufacturing Co., with headquarters in Boston, succeeding A. H. Lane, who goes to the factory at Trenton, New Jersey, as distributers' representative.

The Madison Tire & Rubber Co., Inc., 30 East 42d street, New York City, has arranged to occupy the building at 859 Boylston street, Boston, now occupied by The Miller Rubber Co. This will be a direct factory branch in operation on March 1, in charge of J. H. Connor, formerly manager of the accessory department of the Packard Motor Car Co. of New England.

MISCELLANEOUS MASSACHUSETTS NOTES.

The Boston police appear to have unearthed a well organized plot to steal rubber goods from the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, obliterate the firm's name from the goods and then dispose of them through jobbing houses. Hose worth from $8,000 to $12,000 was seized in a Causeway street cobbler's shop and in the buildings of a High street concern by which it is alleged the hose had been distributed. It is believed, however, that systematic thefts have been in progress since last October, and that rubber goods worth $50,000 have been taken.

Following its usual custom, the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, on December 31, 1919, through its president, George E. Hall, presented gold pieces to such of its employes as had been with the company ten years or longer. Work was stopped at four o'clock and special exercises held, including a concert by the company band, an address of welcome by J. William Fellows, factory manager, and community singing.

Under the auspices of the Business Training Corporation, of New York, the Converse Rubber Shoe Co., Malden, is conducting a school for foremen and executives. The classes meet every two weeks, at which time the men get together at dinner to discuss problems in connection with their work. Among the subjects taken up are teamwork, handling labor, organization, machinery and materials, cost records.

At a meeting of the directors of the Plymouth Rubber Co., Canton, late in January, several of the former directors resigned, including the treasurer, J. E. Stone. A new board of officers and directors was then elected as follows: president, James J. Clifford; treasurer, Ronald T. Lyman; directors, James J. Clifford, Ronald T. Lyman, Nathan L. Amster, W. Lloyd Allen, Daniel H. Harris, W. F. Edlefson and John Sweetser. John J. Batterman, who has been handling the sale of Toesans for the company for some time past, was appointed sales manager.

The ebonite bowling balls made by the Stowe & Woodward Co., Newton Upper Falls, Massachusetts, have sold well this season in spite of prohibition, which was expected to interfere with the sport of bowling, as many alleys were attached to saloons. Robert J. Wilkie, who is connected with the company and is the originator of the ebonite bowling ball, states that some of these hard rubber balls have been used constantly for ten years.

The Athol Manufacturing Co., Athol, Massachusetts, has reorganized its Metropolitan Air Goods Department under the firm name of Metropolitan Air Goods Co., with L. S. Starrett as president and R. A. Whall, treasurer and manager. A two-story cement building will be erected as soon as weather permits, with every modern facility for making up pneumatic rubber goods, to take care of the increased business of this department.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE RUBBER MILLS throughout the state have been handicapped during the past month by the heavy snow-fall, ice and other weather conditions. All were hampered through the inability of employes getting to the plants on account of the impassable highways and by the freight embargoes which curtailed the shipping of materials and production.

The difficulty in moving supplies reached the climax in the great storm at the beginning of February and most of the plants were hard pressed for raw material. The National India Rubber Co. at Bristol was obliged to close its rubber shoe division for about a week, laying off more than 3,500 hands, naphtha being the principal commodity needed. But use was made of the men in clearing the highways between the plant and Warren, a distance of about five miles, to afford an outlet for the company's freight.

Besides these the general outbreak of influenza throughout the state was responsible for many employes not reporting for work. In several departments in some of the plants as high as 50 per cent were out at the height of the outbreak, and a number of deaths were recorded.

The Mount Hope Spinning Co., which manufactures fine yarns for tire fabric, at Warren, Rhode Island, is going to build a new mill in that town and work will be started as soon as the weather conditions permit. The new mill, which is to be located alongside the company's present plant on Cutler street, will be 200 feet in length and 110 wide and two stories in height.

The Mount Hope Spinning Co. a few years ago purchased one of the mills with storehouses and other mill buildings from the Cutler Mills Co., completely renovating all the property, and installed new machinery throughout. It has prospered from the start and for more than a year now the plant has been operated at capacity both night and day. When the new mill is completed the company will be in a position to double its output. This company also controls mills in Taunton, Massachusetts, and other places.

The Lynn Rubber Co., Warren, has absorbed the Morrison Brothers Heel Co., Boston, and in the future will manufacture not only rubber heels but other articles, such as arch supporters, etc. The consolidation of these two plants will double the capacity of the Lynn Rubber Co., and preparations are being made so that the plant can be operated day and night.

The annual meeting of the stockholders of the Lynn Rubber Co. was held at Warren, February 7, when the following directors were elected: Elmer K. Watson, J. William Long, Walter J. Howland, Clarence H. Seymour and Leonard P. Bosworth. At a subsequent meeting of the directors, J. William Long was elected president and Elmer K. Watson, treasurer. William Wheeler and F. M. Cartland, former president and treasurer, respectively, will in the future represent the company on the road and also serve in advisory capacities. No dividend was declared at the meeting.

The offices of the Lynn Rubber Co. will for the present remain in the Wilmarth building, on Main street, Warren, but in the near future accommodations will be made for the offices of the concern at the plant on Cutler street. Mr. Long, the new president, has a thorough knowledge of the business coming from Stoughton, Massachusetts, where he has been employed for several years as superintendent and head chemist with the Panther Rubber Co.

John F. Sweeney, who has been acting plant manager of the American Wringer Co.'s factory, Woonsocket, since the resignation of W. Maxwell Reed, some time ago, was made plant manager early the past month at the meeting of the directors. Mr. Sweeney has been with the American Wringer Co. since 1889, when he entered the employ of the concern as office boy and gradually worked his way up to his present position. He states that the plant is facing the most phenomenal year of its existence. Last year 500,000 wringers were turned out and this year it will be no surprise if 1,000,000 are made.

Henry C. Wagner, factory manager of the Woonsocket Rubber Co.'s plants in Woonsocket (the Alice Mill) and of the Manville Mills, at Manville, has been appointed general assistant to Myron H. Clark, general footwear factory manager of the footwear division of the United States Rubber Co. Mr. Wagner assumes his new duties March 1. Henry S. Marlor, now superintendent of the Lycoming Rubber Co. at Williamsport, Pennsylvania, will succeed Mr. Wagner as the factory manager of the Woonsocket Rubber Co.

Mr. Wagner started with the Meyer Rubber Co., at Milltown, New Jersey, and then went to Bristol, Rhode Island, where he occupied an executive position with the National India Rubber Co. He remained there three years and then went to Woonsocket, where he has been a resident for 15 years. He has served as superintendent at the Millville rubber boot mill at Millville and as superintendent of the Alice rubber shoe mill at Woonsocket at different times, and for a number of years has been factory manager and has been in charge of both of the Woonsocket Rubber Co.'s mills.

It is understood that The Ninigret Co., Pawtucket, manufacturers of fabric for automobile tires, contemplates the erection of a large addition to its present plant which was purchased about six months ago from the Greene & Daniels Co., since which time it has been running night and day to fill its orders which are said to be accumulating faster than they can be filled.

Employes of the Davol Rubber Co., Providence, have formed a mutual benefit association under the direction of the welfare department of the company, and a fund of $500 has been appropriated by the company in order that the association may start in a prosperous condition. Although membership is not compulsory, it is expected that a majority of the employes will join. Sick benefits will be paid at the rate of $1.25 per day for a period not exceeding 13 weeks and the death benefit will be $100. Group insurance was instituted by the company nearly two years ago.

The trade certificate of the Elliott Tire Shop, 143 High street, Pawtucket, has been filed at the city clerk's office, giving the name of Walter E. Elliott as owner.

THE RUBBER TRADE IN NEW JERSEY.

By Our Regular Correspondent.

THE WILL of Alfred Whitehead, secretary of the Whitehead Brothers Rubber Co., Trenton, has been admitted to probate in the office of the surrogate at Trenton. He left his entire estate to his widow. The real estate is valued at $20,000 and no inventory of the personal estate was filed.

The Empire Rubber & Tire Co., Trenton, has elected W. G. Heath and F. I. Reynolds to fill the vacancies on its board of directors caused by the resignations of J. E. Baum and J. Cornell Murray. W. M. Pepper has been elected president, succeeding Mr. Baum; F. I. Reynolds, vice-president; C. Edward Murray, Jr., vice-president and treasurer; H. R. Nason, secretary. The board of directors is as follows: General C. Edward Murray, chairman; W. D. Campbell, W. M. Pepper, W. G. Heath, C. Edward Murray, Jr., J. Frazier and F. I. Reynolds.

Associated with Mr Reynolds are: W. A. Reynolds, former sales engineer of the mechanical rubber goods division of the United States Rubber Co.; J. Baker Taylor, former general eastern district sales manager of the tire jobbing department of the United States Rubber Co., and R. V. Dickinson, who formerly occupied a similar position in the West for the same company.

S. H. Smith, formerly factory manager of the Gillette Rubber

Co., Eau Claire, Wisconsin, has been appointed factory manager of the Empire Rubber & Tire Co., Trenton.

J. Cornell Murray, formerly treasurer and a director of the Empire Rubber & Tire Co., Trenton, has associated himself with The Crescent Insulated Wire & Cable Co., Trenton.

The Crescent Insulated Wire & Cable Co., Inc., Trenton, has contracted for a one-story addition to its factory, 50 by 132 feet.

W. E. Sanders, of the Essex Rubber Co., Trenton, recently gave an address on "Rubber" before the Trenton Knights of Columbus. He told of the various processes the material goes through from the tree to the finished products.

The Delion Tire & Rubber Co., of Baltimore, Maryland, which purchased the name and good will of the Delion Tire & Rubber Co., of Trenton, is preparing plans and specifications for its new building. A nine-acre tract of land has been purchased along the West Shore railroad, where the erection of the new buildings will begin at an early date. The plant will cost more than $200,000, including buildings and power equipment.

The annual meeting of the Woven Steel Hose & Rubber Co., Trenton, was held February 2, when the following directors were elected: John S. Broughton, Karl G. Roebling, Horace B. Tobin, all of Trenton; John H. Janeway, of New York City, and Albert Rogers, of Philadelphia, Pennsylvania. The directors will meet later to elect officers.

John S. Broughton, president of the United & Globe Rubber Co., Trenton, has been appointed one of the commissioners to condemn land for the city for the erection of a new city wharf.

Bruce Bedford, president of the Luzerne Rubber Co., Trenton, and Mrs. Bedford will leave here early in March for a trip to Jamaica, West Indies, for several weeks.

Bruce Bedford, president of the Luzerne Rubber Co., has been appointed a member of the Trenton City Planning Committee, to aid in the development of Trenton.

William J. B. Stokes, J. Oliver Stokes and General C. Edward Murray, prominent rubber manufacturers of Trenton, have each contributed $25,000 towards the erection of a new $500,000 home for the Young Men's Christian Association. Clifford H. Oakley, president of the Essex Rubber Co., and C. Edward Murray, Jr., second vice-president of the Empire Tire & Rubber Corp., each contributed $500, while Horace L. Boyer gave $1,000. Horace B. Tobin, secretary and treasurer of the United & Globe Rubber Co., gave $500. General Murray was chairman of the general committee and spent considerable time in the work.

The Joseph Stokes Rubber Co., Trenton, will build a steel and brick addition to the plant on Taylor street. The structure will be two stories, 70 by 100 feet, and will cost $35,000.

Plans are being drawn for a three-story brick and steel building for the Ajax Rubber Co., Inc., Trenton. The structure will be 60 by 350 feet and will cost $39,000.

MISCELLANEOUS NEW JERSEY NOTES.

The Sterling Tire Corp., Rutherford, New Jersey, has increased its capital from $2,500,000 to $3,700,000. The company has 19 factory sales branches.

The Smith Rubber & Tire Co., Inc., 625 Main avenue, Passaic, New Jersey, has broken ground at Garfield, New Jersey, for its cord tire factory which is to be two stories high, 60 by 200 feet, with an initial daily capacity of 600 cord tires. The excavating and grading has been completed, the concrete foundations put in, and the concrete forms for the corner posts and side walls partially constructed. Machinery and equipment has been ordered and the date for delivery set. It is hoped the factory will be in operation by May 15.

The officers are: Winfield Clearwater, president; Fred W. Smith, vice-president; Dudley Gordon, secretary, and Thomas A. Hopkins, treasurer.

The Zee-Zee Rubber Co., Yardville, New Jersey, has increased its capital from $1,000,000 to $5,000,000 and expects to open 50 chain stores this year in addition to those already in operation. Irvin Zimmerman is president.

William G. Zimmerman, vice-president of the Zee-Zee Rubber Co., Yardville, who has been ill of pneumonia for several weeks at his home, has recovered and is now able to be about again.

The National Oil Products Co., Harrison, New Jersey, has elected M. A. Richards, formerly vice-president, its president, succeeding the resignation and withdrawal from the company of Arthur Phillips, the former president.

The Gibraltar Tire & Rubber Co., New York City, is having plans drawn for a modern rubber plant to be located in West New York, New Jersey. The plot has a frontage along the Hudson County boulevard of 90 feet and a depth of 150 feet. The company will engage in the manufacture of tires.

MILLER TIRE REPAIR SCHOOL A SUCCESS.

Many prominent tire men believe the time is not far distant when it will be necessary for the tire repair men to show proof of training and study under competent authority. Already there are being operated in Akron, Ohio, a few tire repair schools, among the largest of which is that conducted by The Miller

A School for Tire Repair Men

Rubber Co. This institution has averaged 35 graduates a month since last August and plans are nearly completed for doubling the size of the school.

Every graduate of the Miller school receives a diploma certifying that he has finished the regular course of instruction, consisting of lectures, text-book study, and practical repair work. The student is first made thoroughly acquainted with the details of tire construction before he is actually trained in repair work. Repair stocks, fabrics of all descriptions, air bags, vulcanizing machines and methods, common sources of tire trouble, etc., are among the subjects taken up. The chief instructor and his assistants in the school are thoroughly experienced tire men from both the factory and retail business standpoints.

Because of the great demand for the training, the course has been made as brief as is consistent with turning out expert tire repair men. It is said that the average man can complete it in a month. Some, however, require longer training. None is given a diploma until his work has passed the necessary high average standing. The wide interest taken in the school is evidenced by the class roll which shows students from nearly all of the states in the union.

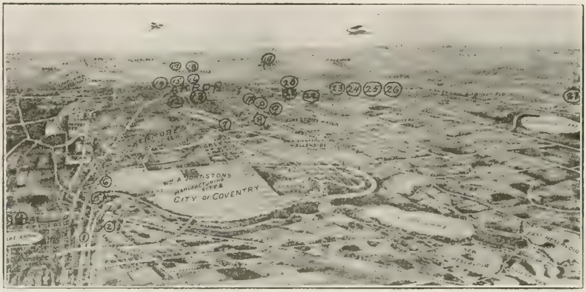
THE RUBBER TRADE IN OHIO.

By Our Regular Correspondent.

COVENTRY—AKRON'S NEW INDUSTRIAL CITY.

An interesting example of systematic and intelligent town planning is being carried out in the heart of the rubber district of Ohio, midway between the cities of Akron and Barberton, in the region known as "Greater Akron." It cannot be called an experiment because William A. Johnston, president of the Rubber Products Co., for many years has been developing the land in the vicinity of the Portage lakes into residential and industrial settlements, with the assistance of experienced landscape architects and of other experts, and already has Allenside and other communities to his credit.

For the present enterprise Mr. Johnston bought a tract of 350 acres of level ground, lying between the yards of the Pennsylvania and of the Erie railroads that serve the great rubber factories of the Akron district, together with the Belt line, on the one hand, and the bend of the Tuscarawas river on the other, and named the place Coventry. Across the river lies Allenside.



Aeroview of Coventry in Greater Akron, Center of the United States Rubber Industry.

1. Avalon Rubber Co.
2. The Biltwell Tire & Rubber Co.
3. The Portage Rubber Co.
4. Rubber Products Co.
5. The Lincoln Rubber Co.
6. Lambert Rubber Co.
7. Western Reserve Rubber Co.
8. Firestone Tire & Rubber Co.
9. The Miller Rubber Co.
10. Star Rubber Co.
11. The Na-Peer Tire Co.
12. The Philadelphia Rubber Works Co.
13. The B. F. Goodrich Co.
14. American Rubber & Tire Co.
15. Swinehart Tire & Rubber Co.
16. B. & W. Rubber Co.
17. The Marathon Tire & Rubber Co.
18. Falls Rubber Co.
19. The Mason Tire & Rubber Co.
20. The Goodyear Tire & Rubber Co.
21. The Mohawk Rubber Co.
22. Kelly-Springfield Tire Co.
23. The Phoenix Rubber Co.
24. American Hard Rubber Co.
25. General Tire & Rubber Co.
26. The Amazon Rubber Co.
27. The India Tire & Rubber Co.

The industrial end of Coventry has two miles of double portage on the Belt line, and is within easy walking distance of the Firestone Tire & Rubber Co.'s immense plant, of the Miller Rubber Co.'s reservation for new buildings, and of that of the Akron Rubber Mold & Machine Co. The Rubber Products Co.'s buildings are across the railroad track. The plan provides for mills and factories, schoolhouses, churches, motion picture theaters, a community center, business streets with restrictions on the buildings, a stadium, streets, sewers, water and all modern conveniences, and 1,500 house lots.

The accompanying aeroview shows not only the location of the town in reference to the neighboring rubber centers and to its own corner of Ohio, but also the astonishing number of noted rubber establishments that are grouped about it. It will be interesting to watch the career of the new-born Coventry.

AKRON NOTES.

Rubber manufacturing concerns in Akron are holding surpluses amounting to approximately $125,000,000 from distribution until the Supreme Court decides whether stocks issued against these surpluses are subject to the excess profits tax. If the Supreme Court hands down a decision permitting the issuance of the stocks without making them taxable, most of the rubber companies will issue stock. If the court holds they are subject to taxation, no par value shares will be issued.

Rubber manufacturers, builders and real estate men predict that Akron will become a city of tents and barracks this summer when the $40,000,000 construction program gets under way. There is not a man in the city of Akron out of work now, and there is scarcely a room, not to speak of a house, vacant in the city.

If the work planned for this year, both in the rubber industry, city building and the building of private residences is to be undertaken at all, the men to do the work must be brought to Akron from other cities and the only place for them to live while they are working will be in tents and barracks.

The Coventry Land & Improvement Co., subsidiary to the Firestone Tire & Rubber Co., will begin its building program in Firestone Park this spring with 300 new homes.

Rubber footwear factories have reported that a large number of representatives from Europe are coming to Akron to make contracts for the needs of their countries. The scarcity of leather has made the Europeans turn to rubber as the best substitute. Rubber heels and soles are especially in great demand in Europe, it is said.

Exports to foreign countries from Akron are now at the rate of approximately $20,000,000 a year. But for the high rate of exchange the amount would probably be double this figure.

Announcement has been made that Plant No. 2 of The B. F. Goodrich Co. will be ready to produce 3,000 tires daily, of small dimensions, within the next few weeks.

The Firestone Tire & Rubber Co., Akron, is educating its office employes by means of motion pictures. Sixteen films have been produced by the Division of Films, including "Most Miles Per Dollar," "The Rubber Industry in Malaysia," and "For the Common Good." Each series consists of five reels.

C. L. Mason, formerly western service manager, has been appointed manager of the north central district of the Firestone Tire & Rubber Co., with headquarters at Akron.

The General Tire & Rubber Co. is completing plans to take over permanently the coal mine which it leased during the coal strike and operated with rubber workers. Thirteen miles of track must be laid to the company's plant in order to produce and deliver coal economically.

The stockholders of The Miller Rubber Co. have approved the proposal of the directors that the capitalization of the company be raised from $20,000,000 to $60,000,000. The immediate issuance of $10,000,000 worth of the preferred stock has been decided upon. The business for the past year aggregated $26,495,482. Profits for the year amounted to $2,193,547.

The Mohawk Rubber Co., Akron, has increased its capitalization from $2,000,000 to $5,000,000. The purpose for which the

funds derived from the sale of the stock will be used has not been announced.

The Amazon Rubber Co. has been bought by a syndicate headed by Dr. E. E. Quirk, an Akron financier. The capitalization of the company is to be raised from $400,000 to $1,500,000 in order to finance a material increase in the output of the company. A new site has been obtained and the first unit of a new plant will be built this year.

The Doyle Tire & Rubber Co., Doyle Block, Akron, has organized with the following officers: Dayton A. Doyle, Jr., president and treasurer; Myron J. Sophy, vice-president and sales manager; F. H. Kelsey, vice-president; and Arthur W. Doyle, secretary.

The company will build a factory one story high with basement, 410 by 54 feet, on the Baltimore & Ohio railroad, in the suburbs of the East Akron district.

The H. B. Bixler Co., Ohio Building, Akron, organized by H. B. Bixler, a consulting engineer, has taken over and is operating the Denmead Rubber Co., a heel manufacturing company. The consideration for the plant is said to have been $160,000.

The following changes in personnel have been made at the factory of The Goodyear Tire & Rubber Co., Akron: James E. Hale, appointed manager of the rim and wheel department; William S. Wolfe, promoted from technical service division to head of tire design division; Walter B. Keith succeeding Mr. Wolfe.

With the promotion of I. R. Bailey, manager of the mechanical goods department of The Goodyear Tire & Rubber Co., to the position of assistant sales manager, two other changes in the Goodyear organization are announced. D. R. Burr, formerly assistant manager of the mechanical goods department becomes manager as successor to Mr. Bailey. Mr. Burr in turn is succeeded by C. A. Jones who has served as manager of the hose, railroad supplies and rubber band departments of the mechanical goods division.

C. A. Jones I. R. Bailey. D. R. Burr.

D. R. Burr has been with the Goodyear company since 1913, joining the company as assistant manager of the mechanical goods department of the Chicago district after having served in a like capacity and also as salesman for a competitive rubber concern. In June, 1916, he was transferred to Akron and made Mr. Bailey's assistant. Recently he returned from an eleven months' trip to Australia where he made an extensive industrial survey. Mr. Burr was educated at Columbus, Ohio, and started his business career there as a bill clerk with a wholesale hardware concern, later launching into business for himself in Miami County, Ohio, where he was engaged in the sale of mill supplies.

C. A. Jones is a "rubber city" product. He was born and educated in Akron, joining the Goodyear company eight years ago. Prior to that time he was with other rubber concerns in estimating cost work on rubber specialties and as assistant in charge of production. Mr. Jones joined Goodyear when the mechanical goods department consisted only of molded goods such as tiling, bumpers and rubber soles and heels, and sold the first thousand pairs of Goodyear rubber soles to shoe manufacturing concerns.

Duffy & Sears, crude rubber brokers, 133 Front street, New York City, have opened an Akron office in the Central Savings & Trust Building, with Sidney Dillingham in charge.

The Frank Dunbar Co., 610 Flatiron Building, Akron, dealing in crude rubber, has appointed George R. MacDonald assistant manager of the Akron office.

Albert V. W. Tallman, New York City, crude rubber broker, has opened an office at 512 Ohio Building, Akron, under the direction of George S. Schworm.

Nineteen nineteen, was a record business year for the Miller Rubber Co. of Akron, Ohio, sales having increased nearly $10,000,000 over the previous year. The sales which amounted to $1,914,443 in 1913 have risen to $16,522,707 in 1918 and $26,495,482 in 1919; it is now anticipated that in 1920 they will be at least $40,000,000. During 1919 new branches were established in Albany, New York; Cedar Rapids, Iowa; Charlotte, North Carolina; El Paso, Texas; Erie, Pennsylvania; Great Falls, Montana; Jacksonville, Florida; Memphis, Tennessee; Oakland and San Francisco, California. Since January 1, 1920, branches have been opened in Cincinnati, Ohio, and Phoenix, Arizona, and the establishment of branches in twelve other cities is being considered.

Plant of The Miller Rubber Co., Akron, Ohio.

The Akron shops of the Wellman-Seaver-Morgan Co. have taken on a complete line of rubber machinery and owing to the unprecedented demand they have run to full capacity for practically the entire year. The orders now booked will keep the shops running from six to seven months at the same rate, and to make deliveries some of this work has been transferred to the Cleveland shops.

CLEVELAND NOTES.

The Osborn Manufacturing Co., 5401 Hamilton avenue, Cleveland, has acquired the charter of the New York corporation of the same name. In November last, the Osborn company increased its capital to $2,000,000 and doubled its plant capacity. Branches and warehouses are maintained at New York, Detroit, San Francisco, Milwaukee, and Chicago. The company also maintains its own representative on foundry molding machines in Europe, in addition to its agencies which include The Allied Machinery Co. of America in France and Italy; Isbecque & Co. in Belgium; and J. W. Jackman & Co. in England.

The Owen Tire & Rubber Co., Cleveland, will increase its capital stock from $1,750,000 to $3,000,000 for the purpose of obtaining additional working capital and adding to its plant and equipment. It expects to have its new building ready for occupancy about July 1.

The Zenith Tire & Rubber Co., Leader Building, Cleveland, expects to build a factory in Cleveland for the manufacture of tires and tubes.

The Paralite Co. removes on March 1 from 609 Swetland Building to its new building at 1684 Columbus Road, Cleveland.

J. M. Bushey, formerly truck tire sales manager in Cincinnati, has been appointed Cleveland manager of the Firestone Tire & Rubber Co., Akron, vice P. M. Pontius, resigned.

MISCELLANEOUS OHIO NOTES.

The Firestone Tire & Rubber Co., Akron, has made the following changes in personnel in two of its Ohio branches: Cincinnati—J. P. Patterson, former manager, appointed manager of south central district, with headquarters in Cincinati; J. F. Evans, formerly trade sales manager, appointed manager of Cincinnati branch, succeeding Mr. Patterson. Toledo—G. F. Guin, formerly trade sales manager, appointed manager, succeeding G. E. Burkit, transferred.

The New Tread Tire Co., Columbiana, Ohio, at its annual meeting of stockholders voted to increase the capital stock from $100,000 to $500,000 to be issued in equal lots as to preferred stock. This is for the purpose of installing the necessary machinery and equipment for manufacturing a new tire. The following directors were elected for the ensuing year: S. W. Tidd (president), C. V. Calvin (secretary and treasurer), E. P. Altenburg (vice-president and general manager), E. L. Dieffenbacher, H. W. Hammond, W. O. Wallace, C. R. Heck, O. W. Altenburg. Officers were elected as indicated.


Eric P. Altenburg.

The Rotary Tire and Rubber Co., Zanesville, Ohio, has increased its capital stock from $400,000 to $800,000. It began the operation of its new factory in October last and has a capacity of 300 tires a day, which the former capital was insufficient to finance.

The Eagle Rubber Co., Ashland, Ohio, has completed a new fireproof addition which doubles its floor space and capacity. This plant is equipped with modern machinery and ventilating appliances for manufacturing on a scientific basis and safeguarding the employes' health.

HEAD OF AJAX SANDUSKY PLANT.

William W. McMahan, who has been appointed vice-president in charge of the Sandusky, Ohio, division of the Ajax Rubber Co., Inc., is a veteran in the tire field.

In 1897 he entered the employ of Morgan & Wright, Chicago. He was soon made factory foreman, then factory inspector, then assistant superintendent and, in 1911, general factory superintendent. For nine years after joining Morgan & Wright, Mr. McMahan remained in Chicago. Then he was transferred to Detroit, where he remained until he was secured by Ajax Rubber Co., to assume complete charge of its Sandusky plant. In recent years Mr. McMahan has been general factory manager of the Morgan & Wright division of United States Rubber Co., first in charge of general production and later in charge of development.


William J. McMahan.

MID-WESTERN NOTES.

By Our Regular Correspondent.

Stresen-Reuter & Hancock, Inc., Chicago, Illinois, chemical manufacturer and broker, has elected the following officers for the ensuing year: F. A. Stresen-Reuter, president; A. S. Procter, vice-president; J. L. Biser, secretary and treasurer.

Mr. Stresen-Reuter, the newly-elected president, sailed from New York in January for an extended European business trip. Mr. Biser is in charge of the Chicago office in his absence.

The Birch Hintz Manufacturing Co., 1100-1110 South Kilbourne avenue, Chicago, Illinois, has dissolved partnership. John C. Hintz has severed connection with William T. Birch and will continue at the above address the manufacture of rubber molds and rubber mold machinery, under the name of The Hintz Manufacturing Co.

The Ilg Electric Ventilating Co., Whiting and Wells streets, Chicago, Illinois, has nearly completed an H-shaped two-story addition, approximately 200 by 300 feet, of concrete, which it expects to occupy by May 1. The company recently purchased the 10-acre tract of land on which the building stands and has provided for its water supply by an artesian well 200 feet deep. Oil-burning boilers will be installed in the factory and the company's own "Ilgair" unit heater system. This is the first of five units planned for erection during the next few years.

H. Thorpe Kessler has resigned as general manager of the Kinzie Rubber & Manufacturing Co., Chicago, Illinois, to manage the Modern Merchandising Co., a new Illinois corporation which he has founded and of which he is president. The new company deals in wearing apparel, including raincoats.

The Firestone Tire & Rubber Co., Akron, Ohio, has made the following changes in personnel in its mid-western branches: St. Louis—T. J. Barry, Manager, succeeding F. C. Rudisell, resigned; Denver, G. K. Meeks, manager; Detroit—G. E. Burkit, manager, succeeding R. H. Jeffers, promoted; Indianapolis—C. T. Barnes, manager, succeeding L. R. Jackson, promoted; Duluth depot—J. L. Bain, manager.

A controlling interest in the Mid-Continent Tire Manufacturing Co., Wichita, Kansas, has been purchased by The Zenith Tire & Rubber Co., Leader Building, Cleveland, Ohio, from which point most of the purchases for the Mid-Continent factory will now be made.

The International India Rubber Corp., South Bend, Indiana, has elected the following officers for the ensuing year: George W. Odell, president and treasurer; P. E. Studebaker, vice-president; B. F. Wulff, secretary, and G. W. Truxell and J. W. Ridge, directors, in addition to the foregoing.

THE MID-WEST RUBBER ASSOCIATION.

The February meeting of the Mid-West Rubber Manufacturers' Association was held at the Chicago Automobile Club, February 11, and was one of the largest and most enthusiastic that has been held by this association since its organization a year ago.

The new president, John T. Christie, of the Hawkeye Tire & Rubber Co., Des Moines, Iowa, was in the chair, and introducing the new general manager, H. S. Vorhis, formerly of The Rubber Association of America, and more recently of the Gutta-Percha & Rubber Manufacturing Co., New York City. Mr. Vorhis in a brief address outlined some of his plans for the development of an aggressive and helpful rubber association in the Middle West, and bespoke the cooperation of the entire membership to this end.

President John T. Christie then called upon a number of those present for brief remarks, among whom A. W. Caney, of The Achilles Rubber & Tire Co., Binghamton, New York, brought greetings from the Eastern contingent of the membership. W.

E. Byles spoke in an interesting manner of the proposed New York crude rubber exchange.

It was decided that future meetings of the association will be held on the second Tuesday of each month.

THE RUBBER TRADE ON THE PACIFIC COAST.

By Our Regular Correspondent.

SAN FRANCISCO NOTES.

The United States Rubber Co., San Francisco Branch, has moved its headquarters from the location it has occupied for ten years at 50-60 Fremont street to its own building at 300-336 Second street, corner of Folsom. The structure is 137.6 by 275 feet, with two stories and basement, and is equipped in the most up-to-date manner. There is frontage on three streets and a spur track connects with the railroad.

The front of the second floor will be occupied by the executive offices of the Pacific Coast division which controls the operations of the fourteen Pacific Coast branches and, through a branch of the United States Rubber Export Co., Limited, the selling end of the company's business in the Hawaiian Islands, Alaska, Japan, India, Indo-China, the Federated Malay States, etc.

The Miller Rubber Co., Akron, Ohio, has opened a new branch in Oakland, across the bay from San Francisco. This is under the management of J. A. Hopkins, operating directly under the San Francisco branch. The territory includes several adjacent counties besides the City of Oakland.

The American Rubber Manufacturing Co., 356 Market street, San Francisco, manufacturer of mechanical rubber goods, is building an addition to its plant near Oakland. The estimated cost will exceed $100,000 when completed, which it is expected will be about the middle of the year.

The Wellman-Seaver-Morgan Co., Cleveland, Ohio, which recently discontinued its Seattle office, is taking care of business in that territory through its San Francisco office at 201 Rialto Building.

The San Francisco team of the Firestone Tire & Rubber Co. recently won against 64 branches the A. G. Partridge championship trophy in the national telegraphic bowling tournament, by bowling 2,758 pins. The same team also won the L. G. Fairbank cup in the second game for the highest team score for a single game. This is said to have been the first national telegraphic bowling contest, but it is expected that it will become an annual affair, so much interest having been shown.

L. R. Jackson has been promoted from the position of manager of the Indianapolis branch to that of the Pacific Coast district of the Firestone Tire & Rubber Co., Akron, Ohio, with headquarters in San Francisco.

LOS ANGELES NOTES.

Burgess Darrow has been appointed head of the technical service division of the Goodyear Tire & Rubber Co. of California, Los Angeles.

The United States Compression Inner Tube Co., a $5,000,000 corporation of Tulsa, Oklahoma, will erect a $1,000,000 factory in or near Los Angeles as soon as a site is decided upon and building materials are secured. It will be essentially a replica of the main Tulsa plant, which gives employment to several hundred workmen and has an annual capacity of 150,000 casings and 300,000 tubes. M. C. Hale, president of the company, is in Los Angeles perfecting plans for the project, and offices of the Pacific Coast division of the company have been opened in the Citizens' National Bank Building by C. R. Privett, distributor for California, Oregon, Washington, Utah, Idaho, New Mexico and Arizona.

SOUTHWESTERN NOTES.

The Savage Tire Co. of San Diego, San Diego, California, has changed its name to The Spreckels "Savage" Tire Co. The officers are: John D. Spreckels, president; Raymond V. Morris, vice-president and general manager; Claus Spreckels, secretary and treasurer; Read G. Dilworth, general counsel. L. S. Chamberlain, former Pacific Coast manager, has been appointed sales manager.

Although automobile casings will be manufactured in the new plant, the principal feature of production will be a patented puncture-proof inner tube.

The Miller Rubber Co., Arkon, Ohio, has opened a branch at Phoenix, Arizona, under the management of W. T. Smith.

The New York Rubber Co., 84-86 Reade street, New York City, has opened an office at 805 Franklin avenue, Houston, Texas.

The Fisk Rubber Co. of New York, Chicopee Falls, Massachusetts, has appointed C. C. Fletcher manager of its Texas district which includes San Antonio, Houston, Dallas and El Paso. Mr. Fletcher was for several years manager of the Fisk company's Oklahoma City branch.

For some years the Fisk Co. of Texas, now the Southern Equipment Co., handled the distribution of Fisk tires, together with accessories, in the State of Texas, but in December last The Fisk Rubber Co. of New York assumed the tire division, the Southern Equipment Co. taking over the accessory end. Practically the same personnel will be retained in the various Texas branches.

J. H. McDonnough, formerly district representative of the central district of the Firestone Tire & Rubber Co., Akron, Ohio, has been appointed manager of the southwestern district, with headquarters at Dallas, Texas.

NORTHWESTERN NOTES.

The Kelly-Springfield Tire Co., New York City, has opened a factory branch at 24-26 North Park street, Portland, Oregon, under the management of C. H. Mead. It also maintains other Pacific Coast branches at Seattle, Fresno, San Francisco and Los Angeles. The branch at Bakersfield, California, has been closed recently.

CANADIAN NOTES.

The United Shoe Machinery Co. of Canada, Limited, Montreal, Quebec, has in process of building a four-story factory addition, 60 by 120 feet. It is expected that the new building will be ready for occupancy about the first of April.

A million-dollar tire fabric plant, which will employ 1,000 hands, is to be built near Montreal by F. L. Jenckes, of the Jenckes Spinning Co., Pawtucket, Rhode Island, U. S. A., and other cotton men associated with him.

John Myles, general manager, and E. Larose, sales manager, respectively, of The Columbus Rubber Co. of Montreal, Limited, recently spent a week in Winnipeg on company business, with G. W. Barrett of the Winnipeg branch , and G. H. Connolly of the Calgary branch. Arrangements have been made to increase factory production to take care of the growing business of the company's western branches.

At the recent convention of the Shoe Manufacturers' Association of Canada, held in Quebec, an address on "A Freshman's Survey of Our Industry" was made by Talmon H. Rieder, president of Ames Holden McCready, Limited, Montreal, and one on "Machinery in the Shoe Trade," by F. W. Knowlton, president of the United Shoe Machinery Co. of Canada, Limited, Quebec.

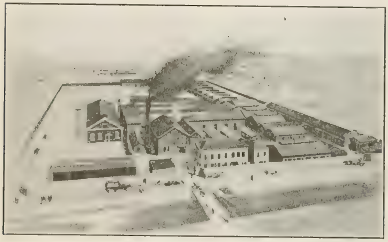
The employes of the Halifax branch of the Dominion Rubber System had the first annual sleighing party and dance on the evening of February 2, at the close of which a supper was served with rubber terms cleverly substituted for possible French ones in the menu.

The Rubber Trade in Japan.

By Our Regular Correspondent.

TRADE ASSOCIATIONS in Kobe and Osaka, Japan, seem to be geographically destined to prosper in commerce and industry, and since the World War, the Japanese rubber industry has made remarkable development, particularly in Osaka and Kobe. Osaka is the commercial and industrial center of the southwest half of Japan, including Korea, Formosa and southern Manchuria. Tokio is commercially the center of the northeast half of Japan. These cities are the largest markets and the distributing points for all commodities in their respective sections of the Empire, while Osaka is at present the chief trading place with Chosen and China, all Oriental countries and the South Sea Islands. Kobe, situated near Osaka, is the largest open port in the western half of Japan, and the biggest trading port of the Empire.

Thus important commercially and industrially as Osaka and Kobe are, they are juniors to Tokio in the history of the Japanese rubber industry. The amount of crude rubber imports at Osaka had been very small until 1912 as compared with that of Yokohama.



KAKUICHI RUBBER CO., LIMITED.

The rubber manufacturing industry of Osaka began with the making of hot-water bags by the cold cure method in 1887. Ten years later, Mr. Sailer, a British Indian, came to Japan and manufactured some rubber articles by the hot cure method, but it gave no animation to the rubber industry. The Chino- Japanese war and the Russo-Japanese war, however, stimulated the rubber industry in Tokio somewhat, and these influences also extended to Osaka and Kobe. Several rubber factories were established in these cities, with the view of manufacturing mechanical goods, rubber balls, bicycle tires, hot-water bags, etc., but they were still in an experimental state.

Owing to the revision of the customs tariff in 1911, the Dunlop Rubber Co. (Far East), Limited, and the Ingram Rubber Co., which had been importing tires and medical instruments, established factories for the purpose of making these goods. Most manufacturers of medical instruments subsequently removed to Tokio, while tire makers still remained there and have made good progress.

During the World War, Japan had to meet home demands with home-made articles owing to the decrease of imports. The scarcity of rubber manufactures in China and the South Sea created a demand for articles of Japanese manufacture, especially tires. Consequently Kobe and Osaka have prospered more and more. For instance, the total amount of imports to Japan during the seven months from January through July, 1918, amounted to $3,507,000, of which $2,431,000 were Kobe imports. Osaka and Kobe exceed Yokohama in quantities of both imports and exports of rubber manufactures.

The objects and officers of the Osaka-Kobe Rubber Industry Association and of the Osaka Rubber Association, whose organization was noted in THE INDIA RUBBER WORLD, June 1, 1919, are as follows:

OBJECTS OF OSAKA-KOBE RUBBER ASSOCIATION.

(a) To protect credits and transactions of the members;
(b) To patronize trade-marks and inventions of its members;
(c) To conduct investigations and make proposals:
(d) To arrange arbitrations;
(e) To advocate rewards and encouragement for faithful employes;
(f) To exercise control over employes.

OFFICERS.

Chief manager, K. Yoshii, of the Kakuichi Rubber Co., Limited; standing manager and accountant, E. Kato, of the Settsu Rubber Co., Limited.

OBJECTS OF OSAKA RUBBER ASSOCIATION.

(a) To dun for payment;
(b) To suspend transactions with customers who refuse payment;
(c) To determine measures for those who infringe contracts with the members, also losses resulting from such infringement;
(d) To report on or to propose investigations ordered by the government;
(e) To encourage and control employes.

OFFICERS.

President, R. Nakamura; vice-president and accountant, S. Tsuji; managers, Iguchi, Limited, S. Iida, Nisshin & Co., Oishi Rubber Shop, Osawa & Co., S. Yoshikawa, T. Tanaka, Nakajima & Co., S. Muneda, Y. Miyakawa, Moriya & Co.

In April, 1919, both the Osaka Rubber Association and the Osaka-Kobe Rubber Industry Association held regular general meetings. No less than 70 members were present at the meeting of the former association at which addresses were made by the chief of Commerce and Industry Section, the deputy of the governor, the mayor of Osaka, the head of the Osaka Commercial Museum, the president of the Chamber of Commerce, the president of the Dunlop Rubber Co. (Far East), Limited, the president of the Tokio Rubber Association, and the president of Miyasaki & Co., of Tokio.

The following are the reports and matters decided at the meeting of the Osaka-Kobe Rubber Industry Association:

(a) The business report.
(b) Rubber manufacturers, especially tire manufacturers, should investigate concerning the total number of tires used in Osaka and Kobe and the western half of Japan.
(c) This association to write for the members when applications concerning commerce and industry (trade-marks, designs for practical use, patents, sanction for exports, various reports, etc.), are required. When trouble takes place in respect to these applications or reports, the association to be responsible.
(d) Purchase and sale of disposed goods and the introduction for newly invented or other novel articles, and new or old stock machines given special prices.
(e) Rewards, encouragement and guidance for workmen shall be entrusted to the officers.
(f) The financial report for last year, and consent for the estimate of 1919.

ASSOCIATIONS MAY UNITE.

These two associations have been considering amalgamation, and the Rubber Club was established with that very object. Apprehensive of the difference of opinion between manufacturers and tradesmen, however, some hoped to organize a legal association, consisting of manufacturers only, while others desired to establish an association of tradesmen. The Osaka-Kobe Rubber Industry Association finally applied independently to the Government in October, 1919, for the sanction of the Department of Agriculture and Commerce as the legal association of the principal rubber tradesmen. It is expected that the Osaka Rubber Association will also make a similar application at no distant date.

EUROPEAN NOTES.

Owing to a fire in the printing office in London on January 29, our esteemed contemporary, "The India Rubber Journal," is obliged to defer publication for a week, as all the manuscripts and materials were burned. A like calamity befell the "Waste Trade World," which was published at the same address, 37 and 38 Shoe Lane, London. Its special export issue must be postponed.

The British Rubber Tyre Manufacturers' Association, Limited, which controls the tire industry in Great Britain, has made proposals for standardizing tires that are being considered by the British Engineering Standard Association which will report on them shortly; they cover all classes of pneumatic and solid tires and rims. The Association denies that it has adopted the sizes agreed upon by a meeting of manufacturers in Paris, who represented England, France, Italy and Belgium.

The British Dunlop Rubber Co. through its subsidary, the Dunlop America Trust Pool, Limited, formed to establish and register Dunlop America Limited, holds 1,000,000 ordinary shares, or 25 per cent of the ordinary share capital of the American company, according to the "Financial Times" of London. It will have the right to nominate a majority of the board of directors, and any future issue of common stock will be subject to the right of the English company to secure 25 per cent of it at par. The English company will receive a fee equal to 10 per cent of the cost of erecting and equipping the American rubber mills and will also receive a royalty out of the net profits of the American company, which will be 6 per cent if the profits amount to $250,000 a year.

PROPOSED LONDON RUBBER CLEARING HOUSE.

London dealers in rubber and rubber shares are considering the establishment of a clearing house for rubber on the lines of the terminal markets now existing for coffee and sugar. Some years ago an effort was made to include rubber among the commodities dealt in by the London Produce Clearing House, but the trade was opposed to it.

The present movement has been strengthened by a large failure due to speculation at the close of 1919, when brokers and dealers felt that greater security was needed in speculative transactions. One section of the trade now favors a clearing house, which would be convenient for handling speculation in futures, as dealings would have to be settled at short intervals and actual buyers and sellers would be brought into contact. An equally influential section, however, opposes it, because it facilitates speculation. The rubber men will meet soon and decide the question.

BELGIAN NOTES.

Bungé et Cie., Antwerp, one of the oldest houses in the rubber business, has been converted into a joint stock company, Société Anonyme Bungé, with a capital of 30,000,000 francs in 3,000 shares of 10,000 francs each. The directors are Edouard Bungé, Georges Born, Willy Friling and Clément Swolfs and the managers are Eugène Friling and Carlo Spruyt.

From Belgium comes the report that the *Brussels Compagnie de l'Hevéa* and the *Antwerp Compagnie Financière des Caoutchoucs* are to amalgamate with the *Crédit Colonial et Commercial* of Antwerp, an export business with branches in London, New York, and Buenos Aires, to be capitalized at 80,000,000 francs.

ANTWERP EXHIBITIONS IN 1920.

The Olympic Games will be celebrated at Antwerp this year, under the patronage of King Albert. In connection with them, an international exhibition of motor cars will be held from May 15 to June 13, under the patronage of the Syndical Chamber of the Automobile and the Royal Automobile Clubs of Belgium. It will include seven classes, as follows: (1) Complete motor cars and chassis; (2) motor car carriage building and its elements; (3) automobile trade; (4) tires and wheels; (5) manufacturers of accessories, mechanical parts and separate pieces for motor cars; (6) accessories, mechanical parts and separate pieces for automobile trade; (7) iron and steel works and foundries relating to the automobile industry.

There will also be held at Antwerp an international exhibition of commercial and agricultural tractors, camions and motors, from June 26 to July 25, and an international exhibition of sports, sidecars, motorcycles, cycles and accessories, from August 7 to September 15. The Belgian Custom House will admit foreign exhibits free and every possible facility will be given to foreign exhibitors. All information and application forms may be obtained from the special representative in the United States, James Gustavus Whiteley, Belgian Consul, 223 West Lanvale street, Baltimore, Maryland.

JAVA'S ENGINEERING CONGRESS.

Brief mention was made in the October number of THE INDIA RUBBER WORLD of the General Engineering Congress to be held at Weltevreden, near Batavia, Java, May 8 to 15, 1920, under the patronage of the Governor-General of the Netherland Indies.

Among the papers promised that are of special interest to the rubber industry are:

"Life of Submarine Cables," by M. P. L. G. Hansen, M. E., engineer at the Post, Telegraph and Telephone Service. "Development of the Submarine Cable System," (author not announced). "The Relation between Vulcanizing Time and the Quality of Final Product in Rubber Manufacture," by Dr. O. de Vries, director of the government rubber experimental station in the Netherland Indies. "Practical Use of Artificial Accelerators for Rubber Vulcanization," by A. Brzesowsky, chemical engineer of the Netherland Indies rubber factory, Bandoeng.

There will be papers also by Dr. P. van Leersum, formerly director of the government rubber plantations, and L. A. van Ryn, general manager of the Netherland Indies rubber factory.

Following this congress, an industrial fair will be held at Bandoeng, where manufacturers of tools, machinery, bicycles, motor cars, and domestic goods of all kinds, may exhibit their products.

Arrangements will be made for trips in Java, so that those attending the congress may visit important engineering works, and the places of interest of the island, like Buitenzorg, with its famous botanical gardens and museum, a rubber estate at Bandjar, and the rubber factories at Bandoeng.

The *Société Générale des Etablissements Bergougnan* whose American branch is the Bergougnan Rubber Corp., Trenton, New Jersey, has been holding the annual convention of department heads at Clermont-Ferrand, France. The company has manufacturing plants in France, Italy, Russia and the United States, plantations in Indo-China and branches in all the countries of Europe, in North, Central and South Africa, South Africa, South America, Canada, Mexico, India, the Straits Settlements, China, Japan, Australia, New Zealand and Tasmania.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED JANUARY 6, 1920.

No. [illegible] Demountable rim for tires. H. Strenetts, Calgary, Alberta, Canada.
1,327,251. Puncture tester for tires. F. Overmyer, Toledo, Ohio.
[illegible] Brassiere with elastic waist zone. M. W. Schloss, assignor to [illegible] Co., Inc.—both of New York City.
1,327,428. Adjustable shower spray device. C. H. Gregory, East Orange, N. J.
1,327,503. Reinforced pneumatic tire. W. I. Varner, Athens, Ga.

ISSUED JANUARY 13, 1920.

[illegible] Vaginal douche. C. W. De Long, Gainesville, Fla.
[illegible] Resilient tire cushion consisting of a rope-like core of twisted strands, each strand composed of twisted plaits, and each plait consisting of plaited flat strips of waste rubber. E. McDowell, Atlanta, Ga.
[illegible] Fountain pen. E. S. Paschall, New York City.
[illegible] Rubber tooth-brush. W. J. Eggers, Brooklyn, N. Y.
[illegible] Tire filled with concentric layers of hose and tubing having central core. F. L. Wadham, Detroit, Mich.
[illegible] Tire tread for pneumatic tire casings and method of making and attaching. O. I. Hobson, assignor of one-half to O. Q. Beckworth—both of Chicago, Ill.
[illegible] Draftsman's fountain ruling-pen. E. R. Moreland, Carrollton, Mo.
1,328,054. Reinforced pneumatic tire. H. Nicholson, Chicago, Ill.
1,325,154. Cushion heel. J. Jackerson, Brooklyn, N. Y.
1,328,215. Fountain pen with lever-filler. De W. C. Van Valer, assignor of one-half to H. W. Geyer—both of New York City.

ISSUED JANUARY 20, 1920.

1,3[illegible] Bread-board with rubber feet. L. W. Serrell, New York City.
[illegible] Shaped sanitary belt. A. T. Van Alstyn, Grand Rapids, Mich.
1,3[illegible] Machine for embossing without dies having rubber carrier apron. F. W. Virkus, La Grange, Ill., assignor to Wood, Nathan & Virkus Co., New York City.
1,3[illegible] Resilient heel or heel-lift. R. I. Hill, assignor, by direct and mesne assignments, to The Hill Rubber Co.—both of Elyria, Ohio.
1,328,605. Demountable split rim for tires. J. H. Wagenhorst, Akron, O., assignor to The B. F. Goodrich Co., New York City.
1,328,632. Spring tire. F. W. Kremer, Rutherford, N. J.
1,328,731. Demountable rim for tires. C. C. Harbridge, Detroit, Mich.
1,328,757. Rubber overshoe for tires. B. J. Mullikin, New York City.
1,328,779. Cushion wheel. G. R. Barker, Chicago, Ill.
1,328,801. Dust-cap for tire valves. J. A. Bowden, Los Angeles, Cal.

ISSUED JANUARY 27, 1920.

1,3[illegible] Gaiter. W. H. Stevens, New York City.
1,3[illegible] Adjustable dust cap for tire valve stems. F. Leming, Hingham, Mass.
1,3[illegible] Dust-cap valve for tires. H. G. Slater, Los Angeles, Cal.
1,3[illegible] Valve-cap for tires. E. E. Holt, assignor to Holt Auto Devices Co.—both of Chicago, Ill.
1,3[illegible] Air bag. P. Powell, assignor of one-half to J. Rosenfield—both of Boston, Mass.
1,329,215. Resilient tire. P. J. Westergaard, Remsbeck, Iowa.
1,329,289. Demountable rim for tires. D. K. Carter, Washington, D. C.
1,329,310. Inflated golf ball and process of manufacture. F. T. Roberts, assignor to The Aranar Co.—both of Cleveland, Ohio.
[illegible] Cushion-tire. C. S. Wert, Kendallville, Ind.
[illegible] Rubber bumper for closet seats, etc. J. R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.

THE DOMINION OF CANADA.

ISSUED JANUARY 6, 1920.

[illegible] Pneumatic tire casing. B. F. Bliss, Wichita, Kansas, U. S. A.
[illegible] Soft rubber eye wiper. C. B. Carr, New York City, U. S. A.
[illegible] Pneumatic tire. I. Greenberg, Baltimore, Maryland, U. S. A.
[illegible] Tire armor with rubber tread. A. E. Jennings, Owensboro, Ky., U. S. A.
[illegible] Demountable rim for tires. The Parker Collapsible Rim Corp., Ill., assignee of L. P. Woodbury, Berkeley, California—both in U. S. A.

ISSUED JANUARY 13, 1920.

195,936. Armored pneumatic tire. A. L. Fry, Lisco, and F. C. Nagel, Ulysses, both in Nebraska, U. S. A.
195,978. Pneumatic tire with removable tread. S. R. Campbell, Toronto, Ont.
196,156. Resilient wheel with pneumatic hub. The Gudgell's Rubber Hub Co., assignee of L. Gudgell, both of Rock Island, Ill., U. S. A.
196,200. Demountable rim for tires. C. Hauptman, assignee of C. A. Tripp, both of Mojave, Calif., U. S. A.

ISSUED JANUARY 20, 1920.

[illegible] Clincher rim for tire blocks. P. J. Hamill, Jerome, Pa., U. S. A.
[illegible] Valves for tires. H. A. Wood, Kingston, Ont.
[illegible] Spring tire. S. Woodall, née Switzer, administratrix, Winchester, Ill., U. S. A.
[illegible] Blow-out patch of rubber-coated wire fabric. L. P. Clark, Fanwood, assignor of a half interest to A. L. Stebor, Jr., Plainfield—both in New Jersey, U. S. A.

ISSUED JANUARY 27, 1920.

196,481. Resilient tire. A. J. Ostberg and A. Kenny, Richmond, near Melbourne, Victoria, Australia.
196,485. Resilient tire. F. E. Allen, Port Huron, Mich., U. S. A.
196,500. Tire inner tube protector. H. S. Blynt, Yale, Okla., U. S. A.
196,503. Spring tire. C. H. Braden, Los Angeles, Calif., U. S. A.
196,517. Life preserver. D. Del Re, Iron River, Mich., U. S. A.
196,533. Tire. M. C. Frank, Piedmont, Calif., U. S. A.
196,561. Bicycle rim. A. C. Bailey, Vancouver, Wash., U. S. A.
196,582. Reinforced pneumatic tire. J. F. Robinson, Los Angeles, Calif., U. S. A.
196,601. Pneumatic clincher tire. H. van der Linde, Toronto, Ont.
196,640. Face veil with elastic cord in edge. The Bonnie-B Co., Inc., New York City, assignee of J. Silverberg, Far Rockaway—both in New York.

THE UNITED KINGDOM.

ISSUED JANUARY, 7, 1920.

134,668. Parachutes with fabric and rigging cords held in place by elastic cords. M. H. Spencer, Balloon Training Base, Sheerness.
134,671. Wheel tires, composed of alternate layers of bands and blocks of rubber covered with a leather tread. W. C. Billham, 115 Avenue Road, Itchem, Hampshire.
134,743. A revoluble holder to attach to heels for holding renewable wearing parts of rubber. J. Smith, Belle-Vue Bungalow, Poulton Road, Fleetwood, Lancashire.
134,748. Divisible rims for tires. J. Milne, Allermuir, Braid Road, Edinburgh.

ISSUED JANUARY 14, 1920.

134,983. Fountain tooth brush. J. A. Hunter, 21 Church House, Belfast.
135,071. Resilient wheel tires. A. C. and N. Jonassen, Whakatane, N. Z.
135,129. Athletic boot with shock-absorbing rubber pad. J. J. Hartopp, Rutland street, Leicester.
135,133. Endless driving belt for automobile fans. C. C. Gates, 999 South Broadway, Denver, Colo., U. S. A.

ISSUED JANUARY 21, 1920.

135,337. Parachutes with rubber distance pieces on netting to prevent damage to fabric. H. Blackburn, 15 Axholme Road, Wheatley, Doncaster, Yorkshire.
135,417. Rubber soles provided with recesses for attachment by cement. J. Brandwood, Brandlesholme, Bury, Lancashire, and A. Thill, 32 Upper Bedford Place, London.

ISSUED JANUARY 28, 1920.

135,494. Pressure gage for pneumatic tire. Protex Manufacturing Co., 1916 West Lake street, assignee of A. E. Pollock—both of Chicago, Ill., U. S. A. (Not yet accepted.)
135,495. Pressure gage for pneumatic tire. Protex Manufacturing Co., 1916 West Lake street, Chicago, Ill., assignee of A. M. Sonnichsen, Milwaukee, Wis.—both in U. S. A. (Not yet accepted.)
135,546. Sponge rubber air cushion for covering airplane or vehicle parts to prevent injury to occupants by collision. A. H. Parrott, 87 Cornwall street, and H. Round, 141 Great Charles street, both in Birmingham, and R. H. Davis, 187 Westminster Bridge Road, London.
135,555. Stiffener for rubber boot and shoe soles, impregnated with or carrying phenolic condensation cementing material or bakelite. (See also British patent No. 135,806.)
135,708. Rubber heel with tubular flanged sockets embedded therein for insertion of nails for attachment. G. H. Hickson, Rosedene, Austin avenue, Stockton-on-Tees.
135,741. Pressure gage for pneumatic tire. H. M. Schwab, 827 West Main street, Louisville, Kentucky, U. S. A.
135,742. Inflation valve for footballs. A. Raycraft, 10 F[illegible] Lane, Wouldham, near Rochester, Kent.
135,756. Tire valve arranged transversely to wheel. F. W. Lanchester, 41 Bedford Square, London.
135,798. Demountable rim for tires. L. Johnson and J. T. Roberts, 12 King Henry's Walk, London.
135,806. Reinforced rubber shoe sole. (Reference is also made to British patent No. 135,555.) H. C. Egerton, 31 Hampton Place, Ridgewood, and H. L. Duncan, Mahwah—both in New Jersey, U. S. A.
135,841. Demountable rim for tires. The Goodyear Tire & Rubber Co., assignee of J. B. Atkins, 366 North Arlington street—both of Akron, Ohio, U. S. A. (Not yet accepted.)

THE FRENCH REPUBLIC.

PATENTS ISSUED, WITH DATES OF APPLICATION.

492,013. (February 18, 1919.) Tube for airplane motor, made of rubberized tissues instead of rubber. Joseph Ameil and Maurice Coquilhat.
495,279. (January 29, 1919.) Resilient wheels for automobiles. J. le Acuna.
495,309. (June 5, 1916.) Improvements in rubber tires. Estes Airless Tire Co., M. F., J. M., and E. S. Amonett.
495,625. (February 6, 1919.) Rim for tire. B. F. C. Haanel.
495,643. (October 2, 1917.) Pneumatic tubes for wheels of vehicles and especially of airplanes. C. Suteau.
495,615. (February 6, 1919.) Rubber trimming for soles of footwear. R. Catin.
496,743. (March 8, 1919.) Valve for pneumatic tire. A. Schrader's Sons, Inc.
496,849. (March 11, 1919.) Improvements in solid rubber tires. The Dunlop Rubber Co., Limited.
496,850. (March 11, 1919.) Improvements in solid rubber tires. The Dunlop Rubber Co., Limited.
495,868. (February 18, 1919.) Sterilizing nipple. C. Quillemin.
496,076. (January 2, 1918.) Captive balloon of great height with provision for elastic automatic change of shape. L. Avorio.
495,979. (January 30, 1919.) Chewing gum. S. W. Cramer.
496,134. (November 6, 1918.) Resilient tire. F. Andersen.
496,278. (March 5, 1918.) New material for insulating electricity and the process for making it. G. Lebeau.
496,369. (February 28, 1919.) Improvement in rubber stamps. F. Pitman.
496,512. (March 31, 1916.) Valve for pneumatic tire. A. Gibouret.
496,605. (February 5, 1919.) Extensible elastic wheel. O. Vannay.
496,684. (March 7, 1919.) Inner tube for pneumatic tire. H. N. Wayne.
497,327. (March 19, 1919.) Nipple. A. Jackson.
497,391. Valve for pneumatic tires. F. H. Veugelers.

Chemical Patents will be found on page 361. Machinery Patents on page 364.

GERMANY.

PATENTS ISSUED, WITH DATES OF APPLICATION.

[illegible] (June 9, 1916.) Resilient tire. Siemens & Halske, Siemensstadt, near Berlin.

318,715 (January 20, 1918.) Rubber pneumatic tires for motor cars. Albert Witzel, Ludwigburg.

[illegible] (July 13, 1918.) Elastic tire for vehicle wheels. Carl Hanbold, Chemnitz, Saxony.

TRADE MARKS.

THE UNITED STATES.

No. 106,212. Representation of an inverted T-square with rounded ends and corner—rubber and composition soles and heels. The Marathon Tire & Rubber Co., Cuyahoga Falls, O.

111,560. The words CRAVA DESTA—raincoats of rubberized and other waterproofed material. James Harbert, Polson, Mont.

114,966. Representation of Maltese cross enclosing two concentric circles banded horizontally across the front—asbestos and rubber clothing, gloves, mittens, leggins, etc., for firemen. American-La France Fire Engine Co., Inc., Elmira, N. Y.

116,223. The word KLENZO—druggists' rubber goods. United Drug Co., Boston, Mass.

118,653. The word CARDINAL and a representation of a cardinal bird sitting on a tree-limb, the bird being red with a black portion near the eyes, and the limb blue—inner tubes. Spencer Carroll Co., Dallas, Tex.

118,755. The word ELASTO—girdles, hip-reducers, corsets, and other reducing garments. The Elastowear Manufacturing Co., Cincinnati, O.

118,75[illegible]. Representation of a seal bearing the initial G and the words, GORMAN'S HONEST SHOES—men's, women's and children's shoes, boots and slippers of leather, cloth, rubber, or a combination of two or more of these materials, etc. Medora A. Feehan, Haverhill, Mass.

118,935. The word WONDERWEB—suspenders, garters, woven elastic belts, etc. Rice Stix Dry Goods Co., St. Louis, Mo.

118,977. Representation of a goat climbing a mountain—composition soles and heels for boots and shoes. Armstrong Cork Co., Pittsburgh, Pa.

118,978. The words MOUNTAIN GOAT—composition soles and heels for boots and shoes. Armstrong Cork Co., Pittsburgh, Pa.

119,071. Representation of a roller passing through the D and A of the word IDEAL—rollers for printing presses, typewriters, paper, textile, and metal coating, inking and coloring machines; proofing in printing and lithographing, etc. Ideal Roller Co., Chicago, Illinois.

119,204. The word OMO, having a pair of wings outspread from the top points of the M—sanitary belts and aprons and surgical gum tissue. The Omo Manufacturing Co., Middletown, Conn.

119,205. The word OMO—sanitary belts and aprons and surgical gum tissue. The Omo Manufacturing Co., Middletown, Conn.

119,711. The words PIED PIPER—children's shoes of leather, rubber, fabric, and combinations of such materials. Marathon Shoe Co., Wausau, Wis.

119,971. The words BIG NINE—boots and shoes of rubber, canvas, or combinations. Converse Rubber Shoe. Co., Malden, Mass.

120,222. The words NATURE TREAD—insole with rubber pad. A. Buckland Plummer, Chicago, Ill.

120,363. Representation of a label edged with a pad locked link-chain and bearing the figure of a man within a colossal garter, adjusting the fastening, accompanied by the words SURE HOLD SURETY GARTER—hose supporter. Ely & Walker Dry Goods Co., St. Louis, Mo., and New York City.

121,494. Representation of a stencil bearing the words: R. T. VANDERBILT CO., N. Y., WHITING, AMERICAN PRODUCTS whiting, a carbonate of lime used as a filler in rubber goods. R. T. Vanderbilt Co., Inc., New York City.

121,605. The word USKIDE shoe soles made at present of rubber and fiber. Revere Rubber Co., Providence, R. I.

121,748. The words ONE-IN-ALL "IN THE RAIN" waterproof coats and slickers. James T. Caradine, St. Louis, Mo.

121,949. The word USCO—dental dam, surgeons' rubber gloves, seamless nipples and nipples for use in nursing sheep. United States Rubber Co., New Brunswick, N. J., and New York City.

122 023. Representation of label bearing bust of athlete beneath the word POLSON—rubber tires, tubes, patches, boots, flaps, treads, pads, valve bases, reliners and rubber belting. The Polson Rubber Co., Cleveland, O.

122,156. Representation of a bear and the words BAER TRADE MARK—collapsible tire rim. Baer Collapsible Rim Corp., San Francisco, Calif.

122,302. Representation of a seal bearing the figure of a hobby-horse in silhouette and the word HOB—baby pants, rubber diapers, etc. Hob Manufacturing Co., New York City.

122,826. The word JAX—rubber heels and soles. Double Suction Rubber Heel & Sole Co., Baltimore, Md.

122,889. The words—THE BLUE RIDGE SHOE—boots and shoes of rubber and fabric, etc. Griggs-Paxton Shoe Co., Inc., Roanoke, Va.

123,201. The word DIAMOND over a black diamond—billiard and pocket-billiard balls. The Brunswick-Balke-Collender Co., Wilmington, Del., and Chicago, Ill.

123,330. Representation of a rubber heel bearing the words TWIN WEDGE—rubber heels. Barva Heel & Tire Factory, Inc., Fort Wayne, Ind.

125,061. The word FLEXYDE—imitation leather. The Marathon Tire & Rubber Co., Cuyahoga Falls, O.

WITHDRAWALS.

128,611. The word CLIMAX—rubber footwear, etc. Apsley Rubber Co., Hudson, Mass. (Application serial No. 120,734 published in THE INDIA RUBBER WORLD, December 1, 1919.)

THE DOMINION OF CANADA.

25,431 The word KNICKERBOCKER—rubber goods of all kinds except boots and shoes. Van der Linde Rubber Co., Limited, Toronto, Ont.

25,432 The word CHALLENGE—rubber goods of all kinds except rubber footwear, golf balls and hockey balls. Van der Linde Rubber Co., Limited, Toronto, Ont.

[illegible] The word AGRIPPA—goods manufactured of rubber and gutta percha. J. G. Ingram & Son, Limited, London India Rubber Works, Felstead street, Hackney Wick, London, N. E., Eng.

[illegible] The words THE STANDARD arranged on a central line or band with relatively short transverse lines or bands uniformly spaced and of the same length—Automobile tires and tire cases. F. E. Partridge Rubber Co., Limited, Guelph, Ont.

[illegible] The words WATERPROOF, 2 IN 1 COAT—all kinds of waterproof clothing. The Montreal Waterproof & Clothing Co., Limited, Montreal, Que.

[illegible] A red disk—fountain pens. The Evans Dollar Pen Co., Waterloo, O., U. S. A.

[illegible] The word PALATINE—rubber heels and solid and pneumatic tires. Leyland & Birmingham Rubber Co., Limited, Golden Hill Works, Leyland, Lancashire, Eng.

[illegible] The word DIAMOND and the representation of a diamond—billiard and pocket-billiard balls. The Brunswick-Balke-Collender Co., Chicago, Ill., U. S. A.

[illegible] The word MAXOTIRE—liners or inside tires for pneumatic tires. K. & W. Rubber Co., Delaware, O., U. S. A.

[illegible] The word RESILIA—garment supporters. The Resilia Manufacturing Co., Cambridge, Mass., U. S. A.

[illegible] Representation of a winged foot between the two syllables of the word GOODYEAR—rubber or composition heels. The Goodyear Tire & Rubber Co. of Canada, Limited, Toronto, Ont.

[illegible] The word PERFECORD—pneumatic tires. Perfection Tire & Rubber Co., Inc., Fort Madison, Ia., U. S. A.

[illegible] The word OXIMONY—dry colors for painters. E. M. & F. Waldo, New York City.

[illegible] The word BASOTOR—chemical used as a base for paint and enamels. E. M. & F. Waldo, New York City.

25,547. The words WRIGLEY'S NIPS with the figure of an elf holding a box on each side—chewing gum, etc. Wm. Wrigley, Jr., Co., Limited, Toronto, Ont.

25,551. Representation of a girl's head within a circle and the words SWEET SIXTEEN—chewing gum, etc. Wm. Wrigley, Jr., Co., Limited, Toronto, Ont.

25,555. The word BRUNSWICK—rubber or rubber and fabric tires and tubes. The Brunswick-Balke-Collender Co., Chicago, Ill., U. S. A.

25,591. The word CUP—goods, except tires, manufactured from rubber and gutta percha. G. W. Beldam, Boston, Lodge, Windmill Road, Ealing, County of Middlesex, Eng.

25,657. The words STAR HAND MADE EXTRA PLY TIRES on representation of a star—tires, tubes, patches, liners, etc. H. T. S. Young, Toronto, Ont.

25,670 Representation of a fish below which appear the words FISH BRAND and, above, the word TOWER'S—waterproof clothing of all kinds. Tower Canadian, Limited, Toronto, Ont.

25,680. Elliptic-shaped device containing words CANADIAN FABRIKOID, the initial and final letters of the latter word being larger than the remaining ones—artificial leather and leather substitutes. Canadian Fabrikoid, Limited, Montreal, Que.

THE UNITED KINGDOM.

38[illegible],521. The word ARIEL—garment supporters, belts, corsets, etc. Faire Bros. & Co., Limited, 2 Southampton street, and St. George's Mills, Leicester.

391,051. The word RoPaCo within a dotted circle—balata machine belting. Ropaco Supply Co., Limited, Wardleworth Mill, Yorkshire, Rochdale, Lancashire.

391,052. The word RoPaCo—asbestos goods, packing, sheeting, and belt compositions. Ropaco Supply Co., Limited, Wardleworth Mill, Yorkshire street, Rochdale, Lancashire.

392,873. Representation of a lion rampant—goods manufactured from rubber and gutta percha, not included in classes other than No. 40, namely: elastic cords and braids, and gusset, garter, frilled, plain, pocket-book, and other webs. Luke Turner & Co., Deacon street Works, Deacon street, and Grange Lane, Leicester.

392,951. Representation of a vise below the word HOLDTITE—friction tape of fabric treated with insulating medium. United States Rubber Export Co., Limited, 1790 Broadway, New York City, U. S. A. (Care of Haseltine, Lake & Co., 28 Southampton Buildings, London, W. C. 2.)

393,186. Representation of a tire bearing the word NORWALK and having within it a conventionalized letter N—tires, casings and inner tubes. The Norwalk Tire & Rubber Co., Belden Hill avenue, Wininpark, Norwalk, Connecticut, U. S. A. (Care of Heron Rogers and Dehn, Bridge House, 181 Queen Victoria street, London, E.C.4.

393,450. The word 'Usco' within single quotation marks—boots, shoes, and slippers. United States Rubber Co., 1790 Broadway, New York City, U. S. A. (Care of Haseltine, Lake & Co., 28 Southampton Buildings, London, W.C.2.)

394,869 Representation of a mechanical device operated by ratchets—goods manufactured of rubber and gutta percha. Herbert Whitworth, Limited, Whitworth House, 115 Princess street, Manchester.

394,927. Representation of a serpent bearing the word SERPENTINE—rubber soles for footwear. George Metcalfe, Woodthorpe, Thrupp, near Stroud, Gloucestershire.

394,977. The word COBENA—goods manufactured from rubber and gutta percha, not included in classes other than No. 40. Baxendale & Co., Limited, 41 Miller street, Manchester.

395,361. The word CONDENSITE—phenol methylene compounds. Condensite Co. of America, Bloomfield, N. J., U. S. A. (Care of White, Langner, Stevens & Parry, 88-90 Chancery Lane, London, W.C.2.)

395,425. The word ACE—raincoats. Louis Bodansky & Sons, Limited, 6 Wade street, Leeds.

395,462. Representation of a label bearing a conventionalized scene of a battleship in a rain-storm at sea and the words EAUTITE and WEATHERPROOF—waterproof garments. William Merrick, "Glenfaba," Campbell Road, Worsley Road, Swinton, Manchester.

395,463. The word TURNEAU—waterproof garments. William Merrick, "Glenfaba," Campbell Road, Worsley Road, Swinton, Manchester.

396,178. The word BELDAMITE—all goods included in Class No. 47. The Beldam Packing & Rubber Co., Limited, 29 Gracechurch street, London, E. C. 3.


THE FIRST AMERICAN LITHOPONE
BECKTON WHITE
DU PONT
THE LITHOPONE
FOR RUBBER MAKERS
This Dependable
Zinc Sulphide
Pigment
is fluffy and bulky. Produces a dense compound of low specific gravity.
Warehouse Stocks
at convenient points
E.I. du Pont de Nemours & Co. Inc.
Sales Dept. Lithopone, Dry Colors and Pigments Division
WILMINGTON, DELAWARE
PHILADELPHIA
3500 Gray's Ferry Road
CHICAGO
McCormick Building
BOSTON
Harvey Building
Gugle Building
SAN FRANCISCO LOS ANGELES SEATTLE
L. H. Butcher Company

The London View of the 1919 Crude Rubber Market.

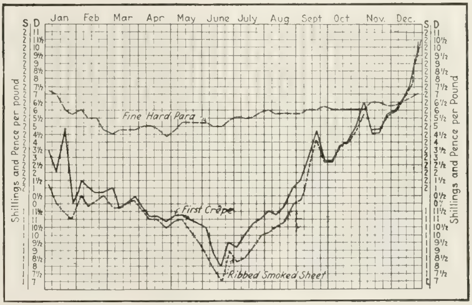
SUPPLY EQUALS DEMAND.

THE DISTINGUISHING FEATURE of 1919 was the enormous supply and demand for crude rubber, especially since June. The prospects are that both will be kept up through 1920 and the succeeding years. There is an increased call not for tires alone but for all rubber articles as well. The total new supply of rubber of all kinds for 1919 was about 334,000 tons, and the stocks of plantation rubber held in addition are large. The supply of Central America and other wild rubbers has been insignificant in comparison and the low grades are very hard to sell.

THE MARKET.

The knowledge of the large supplies of plantation rubber sent prices down to a certain degree so that in June the price of standard crepe was 1*s.* 8*d.* and of ribbed smoked sheets, 1*s.* 7*d.* There were large sales, and speculative buying helped to keep the price up and the year closed December 31 with quotations of 2*s.* 10½*d* for both fine crêpe and ribbed smoked sheets.

The large and steady supply of eastern plantation rubber naturally affects the demand for all grades of Brazilian rubber. The price for hard fine Pará was 2*s.* 7¼*d.* at the beginning of the year and 2*s* 7¼*d* on December 31, though it rose and fell slightly throughout the year.



LONDON SPOT FLUCTUATIONS OF FINE HARD PARÁ, FIRST CRÊPE AND RIBBED SMOKED SHEET DURING 1919.

The prices in the last three years have been as follows:

	Fine Hard Pará.	Negrohead. Scrappy.	Negrohead. Island.	Caucho Ball.
1919	2*s.* 7¼*d.*	1*s.* 7*d.*	1*s.*	1*s.* 8*d.*
1918	2*s.* 7*d.*	1*s.* 7*d.*	1*s.*	1*s.* 8*d.*
1917	2*s.* 8½*d.*	1*s.* 5*d.*	1*s.*	1*s.* 6½*d.*

Jelutong is worth 1*s.* 2*d.* per pound; balata 4*s.* 4*d.* for sheets and 3*s.* 4*d.* for block, while gutta percha realizes high prices.

PLANTATION RUBBER.

PREPARATION AND PACKING.

The quality of the rubber, for the most part, was very satisfactory and creditable to the managers of the plantations. Some rubber cured by the Byrne process was much liked. There was some criticism of the packing. The close press packing which makes a case hold a heavier weight of rubber is not pleasing to the European market and is said to lead to deterioration of the rubber. Bales are also objected to. The packing should be carefully done, with the rubber laid as flat as possible, especially sheets, which should not be folded and not be packed too tight. This holds particularly for the lower grades. The cases should be strong and planed; 150 pounds is a useful size.

The rubber estates in the Far East are more than satisfied with the year's results. "The power of the British Empire and its vast resources were never more manifest and convincing." The Rubber Growers' Association and the Rubber Trade Association helped the trade greatly during the year.

ACREAGE OF PLANTATION RUBBER.

The estimate of planted areas is extremely conservative, nothing being added to the acreage for 1918. It is admitted that the plantations in India and Burma have increased; but the lands where the *Castilloa* is depended upon, Mexico, the West Indies, Central and South America have not progressed, and very slight results have been obtained so far from the attempt to obtain Ceara rubber from the *Manihot* trees in East Africa. The figures for plantation rubber therefore stand:

	1917.	1918.	1919.
Ceylon .... *acres*	290,000	300,000	300,000
Malaya, Malacca..................	780,000	800,000	800,000
Borneo	40,000	50,000	50,000
Dutch East Indies	650,000	700,000	700,000
India and Burma..................	50,000	55,000	55,000
Former German Colonies...........	10,000	8,000	8,000
Samoa, East and West Africa.......	....	....	....
Totals......................	1,820,000	1,913,000	1,913,000

SOUTH AND CENTRAL AMERICAN RUBBER.

The shipments of South American rubber diminished during the year. While the rubber from Brazil, Bolivia and Peru was equal in quantity to that supplied in 1918, the amount of caucho was considerably less. The quantities of Ceara and Maniçoba were very small; Bolivia and Matto Grosso, Pernambuco and Assare, sent much less; Mollendo and Venezuela none. The Central American rubber was of slight importance. Mexico sent almost nothing, Columbia, Ecuador and Nicaragua very little.

The imports of medium Pará have fallen off; for certain grades there has been a fair demand, but soft, weak rubbers have been hard to sell. The following table shows the annual receipts and shipments at Pará during the past three fiscal years:

	July 1 to June 30.		
	1917.	1918.	1919.
Receipts of Pará.................*tons*	29,759	23,000	27,385
Receipts of caucho	9,591	8,600	6,800
Shipments to Europe	14,320	6,035	11,308
Shipments to the United States......	25,950	19,350	27,250

AFRICAN RUBBER.

The quantity of African rubber on the market has fallen off decidedly. Good qualities of the West Coast varieties—Niger, Gold Coast, Accra, Cameroons and Conakry—have sold well, but imports of lump have fallen off. The French Congo and Soudan rubbers, mostly from Senegal via Bordeaux and Havre, sold well. There was a fair supply from the Belgian Congo, but it was hard to sell, except a few good qualities. From the East Coast there was little rubber; very little from the Manihot plantations of British and German East Africa, hardly any from Abyssinia, none from Nyassaland, little from Madagascar and scarcely any red rubber from Zanzibar.

EAST INDIAN RUBBER.

The lesser Asiatic districts, Rangoon, Assam and Penang, sent small quantities to England; Borneo, very little wild rubber but more *Hevea.* The supply of jelutong was small. That of balata was less than in previous years though the demand was strong.

Good qualities of gutta percha brought high prices. Sumatra and Java produced much less Rambong rubber and much of the large output of *Hevea* rubber is not counted in the British figures.

BRITISH STOCKS.

British stocks on December 31 were 24,986 tons of which 770 tons were Pará or caucho and 24,216 tons were plantation rubber. British imports and deliveries of all sorts for the year were 85,816 tons imports and 76,974 tons deliveries; of these 7,823 tons imported and 7,387 tons delivered were Pará and caucho.

THE WORLD'S PRODUCTION AND CONSUMPTION.

The world's production of crude rubber of all kinds for the year 1919 is estimated by authorities at about 334,000 tons. If 50,000 tons is added for stocks on hand and rubber afloat on January 1, 1920, it will give 384,000 tons as the world's supply, the greatest amount on record. The demand during 1919 was nearly as great.

ESTIMATED WORLD'S SUPPLY, 1919.

Plantation Malaya, Ceylon, India and Dutch East Indies ... *tons*	292,000
Brazil and Amazonas	35,000
Matto Grosso, Manicoba, Assare	500
Central American	1,000
West Africa	5,000
East Africa	500
	334,000
Add stocks and afloat January 1, 1920	50,000
Totals	384,000

The consumption of crude rubber of all varieties and grades, but excluding reclaimed rubber, is estimated as follows for 1919:

	1917.	1918.	1919.
England ... *tons*	26,000	24,000	30,000
Germany, Austria	1,000	1,000	2,000
France	10,000	14,000	20,000
Russia	7,000	2,000	1,500
Italy, Spain, Scandinavia	5,500	5,000	7,000
Japan and Australia	5,000	5,000	7,500
The United States and Canada	155,000	187,000	230,000
Totals ... *tons*	209,500	210,000	298,000

This has been mostly consumed. Besides, there is the stock on hand in England, the East and America, say 70,000 tons and 16,000 tons afloat. This is admittedly an underestimate. Leaving out Russia and the Central Powers, where estimates are mere guesswork, the amount consumed by every country in Europe has increased, while the increase for the United States in a single year was about equal to the total normal consumption of the rest of the world.

Much of the information contained in the above review was supplied by S. Figgis & Co., London.

FEDERATED MALAY STATES RUBBER EXPORTS.

An official report from Kuala Lumpur gives the export of rubber from the Federated Malay States in the month of December as 10,340 tons, compared with 9,848 tons in November and 7,085 tons in the corresponding month of 1918. The total for the year 1919 is, therefore, 108,393 tons, as against 78,225 tons in 1918, and 79,831 tons in 1917. A better idea of the enormous strides made by the rubber industry in the Federated Malay States—the leading producer of plantation rubber—is obtained by a glance at the statistics a few years ago. So recently as 1909 the total export for the year amounted to only 2,641 tons. In 1912 it had risen to 15,506 tons, and in 1914 it amounted to 30,697 tons.

Details are appended of the monthly exports for the past three years:

	1917.	1918.	1919.
January ... *tons*	5,995	7,588	7,163
February	7,250	6,820	10,809
March	7,088	7,709	10,679
April	5,955	7,428	7,664
May	7,179	5,851	7,308
June	6,009	5,161	7,094
July	5,798	5,706	8,640
August	6,487	5,291	10,626
September	7,087	6,588	9,841
October	7,079	5,901	8,381
November	6,180	7,097	9,848
December	7,724	7,085	10,340
Totals	79,831	78,225	108,393

STRAITS SETTLEMENTS RUBBER EXPORTS.

The exports of plantation rubber from Straits Settlements ports in the month of December last (according to an official report from Singapore) amounted to 14,244 tons, compared with 13,426 tons in November and 4,839 tons in the corresponding month of 1918. Transhipments amounted to 1,853 tons in the month of December. For the past year, the total exports of rubber amounted to 145,960 tons as against 62,376 tons in 1918 and 73,092 tons in 1917. Part of last year's total was made up of rubber that had accumulated at Eastern ports owing to the lack of shipping; but there was, undoubtedly, a larger production of rubber on the Malayan estates, following upon the abolition of the voluntary restriction of output agreed upon by the principal producing companies. The above figures include transhipments of rubber from various places in the neighborhood of the Straits Settlements, such as Borneo, Java, Sumatra and the non-Federated Malay States, as well as rubber actually produced in the Colony, but do not include rubber exports from the Federated Malay States. Transhipments last year amounted to 17,903 tons.

Appended are details of the monthly exports for the past three years:

	1917.	1918.	1919.
January ... *tons*	3,562	4,302	14,404
February	6,495	2,334	15,661
March	8,299	8,858	20,908
April	6,103	6,584	10,848
May	6,282	13,587	15,845
June	8,775	6,515	5,059
July	7,351	1,978	7,818
August	3,786	1,249	8,933
September	5,679	6,209	10,476
October	4,702	3,260	8,338
November	5,555	2,661	13,426
December	6,503	4,839	14,244
Totals	73,092	62,376	145,960

EXPORTS FROM PENANG FOR THE YEAR 1919.

To Great Britain ... *piculs*[1]	232,440
Europe	......
United States	147,987
Total	380,427

[1] One picul equals 133⅓ pounds.

EXPORTS OF INDIA RUBBER FROM MANAOS DURING THE YEAR 1919.

Exporters	New York. Fine.	Medium.	Coarse.	Caucho.	Totals.	Europe. Fine.	Medium.	Coarse.	Caucho.	Totals.	Grand Totals.
Tancredo, Porto & Co. ... *kilos*	1,167,005	216,845	569,641	600,207	2,553,698	1,106,885	182,633	34,581	32,251	1,356,350	3,910,048
J. A. Mendes & Co.	359,232	184,930	384,668	635,095	1,563,925	1,335,894	......	8,400	......	1,344,294	2,908,219
Stowell & Co.	739,751	230,765	234,616	378,796	1,583,928	462,227	53,582	82,289	479,387	1,077,485	2,661,413
General Rubber Co. of Brazil	1,002,565	148,813	301,123	352,499	1,805,000	493,980	53,162	29,997	28,861	606,000	2,411,000
J. G. Araujo	......	......	30,960	10,240	41,200	500,702	40,617	86,810	131,078	759,207	800,407
Ohliger & Co.	293,260	65,674	24,813	72,790	456,537	......	......	......	......	......	456,537
Adelbert H. Alden, Limited	14,823	25,083	28,401	12,438	80,745	330,627	1,820	46	22,648	355,141	435,886
A. Souza	38,277	2,626	68,781	155,407	265,091	......	......	......	......	......	265,091
Higson & Fall	2,193	170	1,069	16,484	19,916	199,971	12,864	11,280	18,990	243,105	263,021
B. Lévy & Co.	[illegible]	742	[illegible]	......	14,390	82,584	8,417	25,335	36,669	153,005	167,395
Semper & Co.	98,984	5,170	16,010	954	121,118	1,760	1,187	719	......	3,666	124,784
J. Essabba	42,099	6,241	1,660	......	50,000	39,503	3,285	2,945	252	45,985	95,985
J. H. Andresen, Limited	11,749	109	249	......	12,107	61,827	3,267	1,876	1,509	68,479	80,586
Amorim Irmãos	13,600	4,320	16,410	1,380	35,710	12,960	1,590	450	......	15,000	50,710
Simfronio & Co.	38,747	1,687	4,136	6,884	51,454	......	......	......	......	......	51,454
Chase Import & Export Corp.	31,461	10,394	5,612	2,800	50,267	......	......	......	......	......	50,267
Moraes, Carneiro & Co.	23,659	1,681	5,268	1,266	31,874	......	......	......	......	......	31,874
Paulo, Lévy & Co.	......	......	......	......	......	14,510	1,820	4,526	10,915	31,771	31,771
C. Zencovich	......	......	......	......	......	24,849	1,823	1,564	147	28,383	28,383
Francisco Salles Vieira	8,222	26	2,662	10,458	21,368	1,050	......	......	......	1,050	22,418
Ferreira Costa & Co.	14,240	640	590	......	15,470	......	......	......	......	......	15,470
Varios	17,866	3,806	744	......	22,416	7,040	......	......	......	7,040	29,456
	3,929,997	909,122	1,699,403	2,257,692	8,796,214	4,676,369	366,067	290,818	762,707	6,095,961	14,892,175
In transit, Iquitos	370,188	1,082,367	224,048	189,435	1,866,038	275,717	136,461	45,002	249,768	706,948	2,572,986
	4,300,185	1,991,489	1,923,451	2,447,127	10,662,252	4,952,086	502,528	335,820	1,012,475	6,802,909	17,465,161

(*Compiled by Stowell & Co., Manaos, Brazil.*)

UNITED STATES IMPORTS OF PLANTATION RUBBER BY PORTS—1919.

1919.		San Francisco.	Seattle.	Vancouver.	Tacoma.	Totals. Pacific Ports.	Totals. New York.
January	tons	433	2,162	951	......	3,546	1,360
February		1,188	5,256	4,690	1,289	12,423	1,656
March		7,612	5,771	389	341	14,113	9,667
April		1,997	9,117	405	......	11,518	13,160
May		5,254	2,200	......	......	7,454	7,402
June		907	......	1,491	......	2,398	11,247
July		474	987	54	223	1,738	15,947
August		2,335	384	141	233	3,093	5,128
September		823	......	450	......	1,273	8,870
October		548	329	834	......	1,711	13,772
November		678	......	74	......	*1,052	11,997
December		......	......	33	......	*33	21,852
Totals		[illegible]	25,266	9,812	2,086	60,252	132,018

*Reports from Pacific ports for the months of November and December incomplete.

(Compiled by The Rubber Association of America, Inc.)

CEYLON RUBBER IMPORTS AND EXPORTS—1918-19.

IMPORTS.

	January 1 to December 31. 1918.	1919.
Crude rubber:		
From Straits Settlements .... pounds	2,235,585	2,755,106
India	3,242,511	1,819,584
Burma and other countries	3,550	3,436
Totals	5,481,646	4,578,126

EXPORTS.

	1918.	1919.
Crude rubber:		
To United Kingdom .... pounds	19,211,002	31,481,143
United States	16,250,126	62,895,764
Canada and Newfoundland	6,032,022	863,834
Belgium	....	51,520
France	576,505	83,400
Germany	....	11,050
Holland	....	13,476
Spain	....	26
Japan	303,819	267,427
India	4,760	2,649
Straits Settlements	33,750	474
Africa	2,294	....
*Victoria	641,648	98,755
*New South Wales	420,717	171,812
Totals	43,476,643	95,941,320

*These figures include cargoes for transhipment to New Zealand, other parts of Australia, and dependencies.

(Compiled by the Ceylon Chamber of Commerce.)

PLANTATION RUBBER EXPORTS FROM JAVA.

	October. 1918.	October. 1919.	Ten Months Ended October 31. 1918.	Ten Months Ended October 31. 1919.
To Netherlands .. kilos	......	510,000	......	2,074,000
England	....	466,000	1,659,000	6,152,000
United States	157,000	2,223,000	5,204,000	15,633,000
Canada	....	10,000	......	10,000
Singapore	233,000	522,000	6,718,000	4,695,000
Japan	24,000	3,000	691,000	184,000
Australia	242,000	....	596,000	245,000
France	....	....	....	215,000
Other countries	....	....	....	159,000
Totals	656,000	3,734,000	14,868,000	29,367,000
Ports of origin:				
Tandjong Priok	332,000	1,693,000	7,839,000	15,008,000
Samarang	5,000	29,000	129,000	460,000
Soerabaya	319,000	1,874,000	6,668,000	12,746,000
Tjilatjap	....	86,000	....	86,000
Cheribon	....	51,000	....	51,000
Totals	656,000	3,733,000	14,636,000	28,351,000

	November. 1918.	November. 1919.	Eleven Months Ended November 30. 1918.	Eleven Months Ended November 30. 1919.
To Netherlands .. kilos	....	620,000	....	2,645,000
England	....	880,000	1,659,000	7,033,000
France	....	....	....	215,000
United States	306,000	909,000	5,510,000	16,542,000
Singapore	460,000	414,000	7,178,000	5,108,000
Japan	16,000	....	707,000	183,000
Australia	....	....	596,000	245,000
Other countries	94,000	......	94,000	169,000
Totals	876,000	2,823,000	15,744,000	32,140,000
Ports of origin:				
Tandjong Priok	491,000	1,359,000	8,331,000	16,367,000
Samarang	2,000	44,000	132,000	504,000
Soerabaya	289,000	1,414,000	6,957,000	14,161,000
Cheribon	....	7,000	....	7,000
Totals	782,000	2,824,000	15,420,000	31,039,000

LOWEST AND HIGHEST NEW YORK SPOT RUBBER PRICES, 1913-1919.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1913.												
First latex	103 @ 111	96 @ 103	88 @ 96	76 @ 88	78 @ 84	70 @ 77	66 @ 70	66 @ 70	52 @ 64	50 @ 52	52 @ 60	53 @ [illegible]
Smoked sheets	109 @ 113	101 @ 110	97 @ 102	81 @ 97	81 @ 83	72 @ 83	70 @ 73	70 @ 72	60 @ 72	59 @ 61	59 @ 60	60 @ 66
Upriver fine	102 @ 110	96 @ 102	88 @ 96	77 @ 88	82 @ 91	86 @ 89	83 @ 92	83 @ 93	77 @ 88	71 @ 78	73 @ 78	71 @ 74
Upriver coarse	76 @ 84	72 @ 78	63 @ 72	52 @ 66	55 @ 61	54 @ 62	50 @ 56	50 @ 53	48 @ 52	46 @ 49	44 @ 49	44 @ 47
1914.												
First latex	53 @ 61	58 @ 64	58 @ 65	64 @ 72	57 @ 65	54 @ 57	54 @ 57	60 @ 105	52 @ 56	54 @ 62	58 @ 65	73 @ [illegible]
Smoked sheets	60 @ 64	62 @ 64	62 @ 65	64 @ 69	57 @ 69	57 @ 63	56 @ 63	56 @ 80	63 @ 80	63 @ 66	65 @ 84	82 @ [illegible]
Upriver fine	73 @ 77	73 @ 78	73 @ 74	73 @ 74	69 @ 74	68 @ 69	68 @ 73	75 @ 115	64 @ 78	64 @ 66	63 @ 71	70 @ [illegible]
Upriver coarse	44 @ 47	44 @ 47	43 @ 46	43 @ 47	41 @ 46	38 @ 42	38 @ 42	43 @ 89	43 @ 55	43 @ 47	46 @ 53	51 @ [illegible]
1915.												
First latex	59 @ 64	57 @ 63	59 @ 60	59 @ 60	59 @ 61	60 @ 63	62 @ 63	59 @ 61	57 @ 58	61 @ 63	63 @ 78	76 @ [illegible]
Smoked sheets	65 @ 66	65 @ 66	65 @ 66	59 @ 65	59 @ 61	61 @ 63	62 @ 63	58 @ 62	58½ @ 59	59 @ 62	61 @ 75	75 @ [illegible]
Upriver fine	61 @ 75	57 @ 61	58 @ 60	57 @ 60	59 @ 61	61 @ 63	59 @ 63	56 @ 59	55 @ 57	55 @ 57	57 @ 76	68 @ [illegible]
Upriver coarse	45 @ 58	44 @ 48	45 @ 47	46 @ 48	45 @ 46	45 @ 47	44 @ 47	42 @ 44	41 @ 43	42 @ 47	44 @ 62	57 @ [illegible]
1916.												
First latex	70 @ 103	72 @ 90	83 @ 88	74 @ 82	61 @ 74	56 @ 62	52 @ 57	53 @ 56	54 @ 60	56 @ 60	60 @ 69	68 @ [illegible]
Smoked sheets	79 @ 102	75 @ 95	87 @ 93	78 @ 86½	64 @ 77½	58 @ 65½	55 @ 65	56 @ 59½	56 @ 62½	56 @ 65	62 @ 74½	70 @ [illegible]
Upriver fine	77 @ 99	73 @ 80	74 @ 78	72 @ 74	67 @ 72	62 @ 68	65 @ 68	65 @ 68	69 @ 74	71 @ 80	79 @ 93	78 @ 81
Upriver coarse	60 @ 76	52 @ 60	56 @ 59	55 @ 57	50 @ 54	42 @ 50	41 @ 42	39 @ 40	41 @ 44	42 @ 46	[illegible] @ 47	[illegible]
1917.												
First latex	75 @ 80	75 @ 85	82 @ 90	81 @ 83	83 @ 83½	65½ @ 80	65½ @ 67	66 @ 67	66½ @ 67	65 @ 65	[illegible] @ 61	[illegible]
Smoked sheets	75 @ 80	75 @ 75	81 @ 90	81 @ 83	84 @ 84½	65½ @ 80	65½ @ 67	[illegible] @ 67	65½ @ 67	[illegible] @ 64	[illegible]	[illegible]
Upriver fine	75 @ 79	77 @ 79	76½ @ 80	75 @ 76½	75 @ 76	69 @ 74	68½ @ 69	68 @ 69	68 @ 69	[illegible] @ 66	[illegible]	[illegible]
Upriver coarse	[illegible] @ 53	50 @ 53½	52½ @ 54	51 @ 51½	51½ @ 54	49 @ 53	48½ @ 49	48 @ 48	46 @ 48½	[illegible] @ 46	[illegible]	[illegible]
1918.												
First latex	53 @ 58	57 @ 57	[illegible] @ 60	59 @ 70	63 @ 68½	60 @ 63	63 @	63 @	60½ @ 63	[illegible] @ 60	41 @ [illegible]	[illegible]
Smoked sheets	54 @ 57½	53 @ 57	55½ @ 60	59½ @ 70	62 @ 68½	62 @	62 @	62 @	59½ @ 62	[illegible]	40 @ 61	[illegible]
Upriver fine	57 @ 61	56 @ 58	56 @ 60	60 @ 70	68 @	68 @	68 @	68 @	68 @	63 @ 65	[illegible]	[illegible]
Upriver coarse	37 @ 41	35 @ 37	33 @ 34½	34 @ 38½	38 @ 42	40 @	40 @	40 @	40 @	[illegible] @ 44	[illegible]	[illegible]
1919.												
First latex	52 @ 58	56 @ 58	51 @ 56	47 @ 50½	45½ @ 48	40 @ 45	39 @ 42	41½ @ [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Smoked sheets	51 @ 56	54 @ 57	50 @ 54	46½ @ 49½	44 @ 47	39 @ 44	38 @ 41	39 @ 44	44 @ 51	48 @ 54	[illegible]	[illegible] @ 54
Upriver fine	58 @ 61	[illegible] @ 59	[illegible] @ 58	56 @	56 @ 56	53 @ 56	[illegible]	51 @ [illegible]	54 @ [illegible]	[illegible]	[illegible]	[illegible]
Upriver coarse	34 @ 36	34 @ 35	34 @ 35	34 @	31 @ 34	32½ @ 34	32 @ 33	31 @ [illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Review of the Crude Rubber Market.

NEW YORK.

THE CRUDE RUBBER MARKET remained steady through February, declining gradually to the close. There was little buying by manufacturers, but good trading among the dealers. Plantation rubber continues to command higher prices than the Brazilian. The markets in London and Singapore are dull, all trading being affected by the uncertainty in exchange, especially the dealing in futures.

Prices for plantation and South American rubber at the beginning and toward the end of the month are shown in the following quotations:

PLANTATIONS. February 2, first latex crêpe, spot 51 cents; futures, April-June, 52 cents; July-December, 53 cents; February 25, spot, 46-47 cents; futures, April-June 47½, July-December 49½ cents.

February 2, ribbed smoked sheets, spot 51 cents; futures, April-June, 52 cents; July-December, 53 cents; February 25, spot, 46½ cents; futures, April-June 47, July-December 49-49½ cents.

February 2, No. 1 amber crêpe, spot, 52 cents; February 25, 48 cents; futures, July-December 49 cents.

February 2, clean thin brown crepê, spot, 48½ cents; futures, 49 cents; February 25, spot, 45 cents; futures, July-December 47½@48 cents.

February 2, No. 1 roll brown crêpe, spot and futures, 42 cents; February 25, spot, 41 cents; futures, July-December 40-41 cents.

SOUTH AMERICAN PARÁS AND CAUCHO. February 2, spot prices; upriver fine 45 cents, islands fine 44 cents, upriver coarse 34 cents, islands coarse 23 cents, Cametá coarse 23 cents, caucho ball 34 cents. February 25, upriver fine 42½ cents, islands fine 42 cents, upriver coarse 31½ cents, islands coarse 20½ cents, Cametá coarse 21½ cents, caucho ball 32 cents.

NEW YORK QUOTATIONS.

Following are the New York spot quotations, for one year ago, one month ago and on February 25, the current date:

	March 1, 1919.	February 2, 1920.	February 25, 1920.
PLANTATION HEVEA—			
First latex crêpe	$0.56 @	$0.52¼ @	$0.46 @.47
Amber crêpe No. 1	.50 @	.52 @	.48 @
Amber crêpe No. 2	.49 @	.51 @	.47 @
Amber crêpe No. 3	.48 @	.50 @	.46 @
Amber crêpe No. 4	.46 @	.48 @	.45 @
Brown crepe, thick and thin clean	.47 @	.48 @	.45 @
Brown crepe, thin specky	.45 @	.46 @	.42 @
Brown crêpe, rolled	.37 @	.42 @	.41 @
Smoked sheet, ribbed, standard quality	.55 @	.52 @	.46½ @.47
Smoked sheets, plain, standard quality	.54 @	.51 @	.41 @
Unsmoked sheet, standard quality	.54 @	.48 @	@
Colombo scrap No. 1	.39 @	.37 @	@
Colombo scrap No. 2	.37 @	.35 @	@
EAST INDIAN—			
Assam crêpe	.36 @	.46 @ .47	@
Assam onions	.44 @	.46 @ .48	@
Penang block scrap	.48 @	.38 @	@
PONTIANAK—			
Banjermassin	.13½ @	.13 @	.13 @
Palembang	.16 @	@	@
Pressed block	.19 @	.27 @	.27 @
Sarawak	.12 @	.11 @	@
SOUTH AMERICAN—			
PARAS—			
Upriver fine	.58½ @	.47 @	.42½ @
Upriver medium	.53 @	.39 @	@
Upriver coarse	.34 @	.34 @	.31½ @
Upriver weak, fine	.45 @	.37 @	@
Islands, fine	.49 @	.45 @	.42 @
Islands, medium	.44 @	.45 @	@
Islands, coarse	.22 @	.22 @	.20½ @
Cametá, coarse	.22 @	.23 @	.21½ @
Madeira, fine	@	.47 @	@
Acre Bolivian, fine	@	.47 @	@
Peruvian fine	.56 @	.47 @	@
Tapajos fine	.55 @	.46 @	@
CAUCHO—			
Lower caucho ball	.32 @	.30 @	.32 @
Upper caucho ball	.34 @	.34 @	@

SOUTH AMERICAN—	March 1, 1919.	February 2, 1920.	February 25, 1920.
MANICOBAS—			
Ceara negro heads	.35 @	.35 @	.36 @
Ceara scrap	.32 @	.32 @	.30 @
Manicoba, 30% guarantee	.40 @ .41	.26 @	.32 @
Mangabeira thin sheet	.37 @ .38	.35 @	.30 @
CENTRALS—			
Corinto scrap	.36 @ .37	.33 @	.29 @.32
Esmeralda sausage	@	.33 @	.29 @.32
Central scrap	@	.32 @	.29 @.32
Central scrap and strip	@	.30 @ .31½	.27 @.30
Central wet sheet	@	.23 @	.21 @.24
Guayule, 20% guarantee	.33 @ .34	.27 @	.27 @
Guayule, washed and dried	@	.37 @	.38 @
AFRICANS—			
Niger flake, prime	.24 @	.18 @	.17 @
Benguela, extra No. 1, 28%	@	.27 @	@
Benguela, No. 2, 32½%	@	@	@
Congo prime, black upper	45 @	.39 @	.38 @
Congo prime, red upper	@	.37 @	.35 @
Kassai black	@	.40 @	.39 @
Kassai red	@	.36 @	@
Rio Nunez ball			
Rio Nunez sheets and strings	@	.40 @	.37 @
Conakry niggers	@	.40 @	.36 @
Massai sheets and strings	@	.40 @	@
GUTTA PERCHA—			
Gutta Siak	@	.26 @	.30½ @.32
Red Macassar	@	2.90 @	2.65 @
BALATA—			
Block, Ciudad Bolivar	.71 @ .72	.56 @	.50 @.53
Colombia	@	.50 @	.46 @.50
Panama	@	.46 @	.32 @.45
Surinam sheet	.88 @ .89	.82 @	.73 @.76
amber	@	.84 @	.74 @.78

RECLAIMED RUBBER.

The market for reclaimed rubber during February has been active in all the standard grades. Production is practically sold up into the spring months by the leading reclaimers who are not seeking contracts from users at the present time. On the other hand, large consumers are holding back on the present market beyond their commitments for May in anticipation of a hoped for change of prices within a few weeks.

The prices on all standard grades remain the same as the quotations for January.

NEW YORK QUOTATIONS.

February 25, 1920.

Prices subject to change without notice.

Standard reclaims:	
Floating	$0.30 @$0.35
Friction	.35 @ .40
Mechanical	.12½ @ .13½
Red	.23 @ .24
Shoe	.16 @ .16½
Tires, auto	.16 @ .17
truck	.13 @ .14
White	.22 @ .25

COMPARATIVE HIGH AND LOW SPOT RUBBER PRICES.

February.

	1920.*	1919.	Allocated and Free. 1918.
PLANTATIONS:			
First latex crêpe	$0.51½ @$0.46¼	$0.58 @$0.55½	$0.53½ @$0.51½
Smoked sheet ribbed	.51½ @ .46	.57½ @ .54	.52 @ .49½
PARAS:			
Upriver, fine	.46 @ 42½	.59½ @ .58½	.58½ @ .56
Upriver, coarse	.34 @ .31½	.35 @ 34	.37½ @ .35
Islands, fine	.44¾ @ .42	.49½ @ .49	.48 @ .47
Islands, coarse	.21 @ .20½	.22¾ @ .22½	.35 @ .24
Cametá	.23½ @ .21½	.23 @	.35 @ .24

*Figured only to February 25, 1920.

THE MARKET FOR COMMERCIAL PAPER.

In regard to the financial situation, Albert B. Beers, broker in crude rubber and commercial paper, No. 68 William street, New York City, advises as follows:

"During February there has been a fair demand for paper, mostly from out-of-town banks, and early in the month rates were about 6½ per cent for the best rubber names, but at the end of the month buyers wanted 6¾ per cent and 7 per cent on almost everything. It looks as though rates will rule very firm for some time yet."

SINGAPORE RUBBER REPORT.

GUTHRIE & CO., LIMITED, Singapore, report [January 8, 1920]:

At the usual weekly auctions held yesterday and to-day there was a good demand for all grades, with the exception of off qualities ribbed smoked sheet. Fine pale crêpe sold at up to $1.12 (one lot sold for $1.13 and two lots for $1.12½) or 2 cents better than last week. Ribbed smoked sheet fetched $1.11½ (three lots sold at $1.12) or the same as last auction.

Last week's good demand for the lower grades of crêpe continued, and these show advances of from 3 to 3½ cents.

Out of 871 tons catalogd 616 tons were offered and 348 tons sold, many lots of off quality ribbed smoked sheet being withdrawn.

The following is the course of values:

	In Singapore, per Pound [1]			Sterling Equivalent per Pound in London.		
Sheet, fine ribbed smoked.....	108c	@	111½c	2/ 8¾	@	2/ 9¾
Sheet, good ribbed smoked....	98	@	107½	2/ 6	@	2/ 8⅝
Crêpe, fine pale	108½	@	112	2/ 9¼	@	2/10⅜
Crêpe, good pale	101	@	107½	2/ 7¼	@	2/ 9⅛
Crêpe, fine brown	95½	@	103	2/ 5¾	@	2/ 7⅞
Crêpe, good brown	88	@	96	2/ 3⅝	@	2/ 5⅞
Crêpe, dark brown	80	@	90	2/ 1⅜	@	2/ 4⅛
Crêpe, bark brown	74½	@	84½	1/11¾	@	2/ 2⅝

[1] Quoted in Straits Settlements currency $1 = $0.567 United States currency.

BATAVIA RUBBER MARKET.

HERMANS, MARSMAN & CO., Batavia report [November 16 to December 15, 1919]:

At the opening of the market, the tone was very weak, and during the first week of December did not improve; only a few transactions were made, at prices ranging between 1.31-1.42 guilders for fine pale crêpe and prime smoked sheets.

The market closed with more demand and higher quotations. 1.44 guilders (57.6 cents) for prime smoked sheets and fine pale crêpe, while some mixed lots consisting of off crêpe and off sheets were sold at 1.27 guilders (50.8 cents).

AMSTERDAM MARKET REPORT.

JOOSTEN & JANSSEN, Amsterdam, report [January 30, 1920]:

During the present week the market was very firm, a good turn-over being done with rising prices.

At the beginning of the week a fair business was done for deliveries during the present year, mostly for the later months, at f. 1.40½-1.41½, but later on inquiry was mostly confined to spot parcels, for which, in consequence of coverings for January delivery, very good prices were obtained.

On Monday business in standard crêpe was done at f. 1.42, on Tuesday in the inscription f. 1.45-f. 1.47½ was paid, and later in the week even f. 1.50.

During the last days only a little was being offered, but on the other hand the most pressing needs of the moment seem to have been satisfied.

On February 10 277,200 kgs. are being offered in the next inscription, of which about 58,000 kgs. are standard smoked sheets, 112,000 kgs. standard crêpe, and about 100,000 kgs. lower qualities.

ANTWERP RUBBER MARKET.

GRISER & CO., Antwerp, report [January 30, 1920]:

There have been no serious fluctuations of late, the market is sound and was firm at the end of the month. Sales are of little importance, as dealers here are waiting for the auction on February 19. The stock on hand at the port of Antwerp was about 886 tons. The closing prices for futures on January 30 were 14.05 francs for every month from February to October, 14.00 francs November, 13.85 francs December. The tone of the market is firm.

UNITED STATES CRUDE RUBBER IMPORTS FOR 1920 (BY MONTHS).

1919.	Plantations.	Paras.	Africans.	Centrals.	Guayule.	Maniçoba and Matto Grosso.	Total for 1920.	Total for 1919.
January ....tons	17,799	2,620	821	111	...	...	21,351	7,235

(Compiled by The Rubber Association of America, Inc.)

CRUDE RUBBER ARRIVALS AT ATLANTIC AND PACIFIC PORTS AS STATED BY SHIPS' MANIFESTS.

PARAS AND CAUCHO AT NEW YORK.

	Fine.	Medium.	Coarse.	Caucho.	Mixed.	Totals. Pounds.
JANUARY 28. By the S. S. *Manco*, from Pará and Manáos.						
G. Amsinck & Co., Inc....	19,992	......	......	......	......	19,992
Poel & Kelly........	105,938	......	......	......	......	105,938
Cowdrey & Co............	13,500	......	......	......	......	13,500
W. R. Grace & Co........	1,960	......	......	......	......	1,960
Meyer & Brown, Inc......	89,600	......	......	......	......	89,600
Hagemeyer & Brunn......	112,000	......	......	......	......	112,000
H. A. Astlett & Co......	18,700	......	......	19,040	54,700	92,440
Aldens' Successors, Inc. ..	1,312	......	......	6,897	2,068	10,277
Paul Bertuch	12,625	11,055	......	30,938	......	54,618
FEBRUARY 12. By the S. S. *Rembrandt*, at New York.						
H. A. Astlett & Co.......	51,349	......	......	37,558	15,680	104,587
JANUARY 9. By the S. S. *Euclid*, at New York.						
Hagemeyer & Brunn.....	33,600	......	......	112,000	......	145,600
H. A. Astlett & Co.......	73,100	......	......	27,430	1,580	102,110
Paul Bertuch	64,839	30,938	......	......	......	95,777
FEBRUARY 13. By the S. S. *City of Newcastle*, at New York.*						
Poel & Kelly............	......	......	......	......	......	677,670
Thos. A. Desmond & Co..	......	......	......	......	......	39,200
William H. Stiles & Co...	......	......	......	......	......	70,070
Chas. T. Wilson & Co., Inc.	......	......	......	......	......	38,220
Rubber Trading Co	......	......	......	......	......	176,304
L. Littlejohn & Co., Inc..	......	......	......	......	......	333,886
F. R. Henderson & Co....	......	......	......	......	......	257,348
Raw Products Co........	......	......	......	......	......	32,928
Adolph Hirsch & Co......	......	......	......	......	......	14,994
A. C. Fox & Co	......	......	......	......	......	22,050
Edward Maurer Co., Inc .	......	......	......	......	......	80,850
J. T. Johnstone & Co., Inc.	......	......	......	......	......	150,430
FEBRUARY 24. By the S. S. *Karimoen*, at New York.						
United Malaysian Rubber Co., Limited	......	......	......	......	1,210	1,210

*Details not available.

PLANTATIONS.

(Figured 180 pounds to the bale, or case.)

	Shipment from:	Shipped to:	Pounds.	Totals.
JANUARY 25. By the S. S. *Fluor Spar*, at New York.				
Meyer & Brown, Inc...	Colombo	New York	378,560	
Hadden & Co..........	Colombo	New York	4,000	382,560
JANUARY 28. By the S. S. *Rotterdam*, at New York.				
Meyer & Brown, Inc...	Rotterdam	New York	132,160	
Aldens' Successors, Inc.	Rotterdam	New York	288,177	420,337
JANUARY 28. By the S. S. *Vistalia*, at New York.				
Arthur Meyer & Co., Ltd.	London	New York	30,420	
L. Sutro & Co.........	London	New York	135,000	
Meye r& Brown, Inc...	London	New York	112,000	
Various	London	New York	989,780	1,267,200
JANUARY 28. By the S. S. *Mauretania*, at New York.				
Various	Southampton	New York	5,940	5,940
JANUARY 30. By the S. S. *Valdura*, at New York.				
William H. Stiles & Co.	London	New York	11,200	11,200
FEBRUARY 1. By the S. S. *West Mohno*, at New York.				
Chas. T. Wilson & Co., Inc.	Liverpool	New York	35,280	
Various	Liverpool	New York	7,020	42,300
FEBRUARY 2. By the S. S. *Sydic*, at New York.				
L. Littlejohn & Co., Inc.	Colombo	New York	80,640	
Chas. T. Wilson & Co., Inc.	Colombo	New York	186,660	
Weise & Co.............	Colombo	New York	21,780	
C. C. Trevanion & Co..	Colombo	New York	123,300	
Winter, Ross & Co.....	Colombo	New York	33,480	
H. Ickleheimer.........	Colombo	New York	55,080	
Meyer & Brown, Inc...	Colombo	New York	235,200	
Various	Colombo	New York	909,900	1,646,040
FEBRUARY 2. By the S. S. *Arabia Maru*, at Seattle.				
Firestone Tire & Rubber Co.	Singapore	Akron	845,100	
Chas. T. Wilson & Co., Inc.	Singapore	New York	435,600	
F. R. Henderson & Co..	Singapore	Seattle	25,020	
F. R. Henderson & Co..	Singapore	New York	14,940	
Aldens' Successors, Inc.	Singapore	New York	50,940	1,371,680
FEBRUARY 2. By the S. S. *Methuen*, at New York.				
The Goodyear Tire & Rubber Co	Singapore	Akron	86,400	
L. Littlejohn & Co., Inc..	P. Swettenham.	New York	28,800	
Firestone Tire & Rubber Co.	Singapore	Akron	504,000	
F. R. Henderson & Co..	Singapore	New York	6,320	
General Rubber Co.....	Singapore	New York	1,493,820	
Meyer & Brown, Inc...	Singapore	New York	112,000	2,231,340
FEBRUARY 2. By the S. S. *Mexico Maru*, at Seattle, via Yokohama.				
Fred Stern & Co.......	Singapore	New York	28,800	
J. T. Johnstone & Co., Inc.	Singapore	New York	33,600	
Firestone Tire & Rubber Co.	Singapore	Akron	587,320	
United Malaysian Rubber Co., Ltd.	Singapore	New York	20,160	
F. R. Henderson & Co..	Singapore	Seattle	414,120	
Latham & Co..........	Singapore	Seattle	237,600	
Various	Singapore	Seattle	960	1,322,560
FEBRUARY 2. By the S. S. *Minnekahda*, at New York.				
General Rubber Co.....	London	New York	135,180	
The Goodyear Tire and Rubber Co.	London	Akron	137,880	
Konig Bros. & Co......	London	New York	464,040	
Baring Bros.	London	New York	21,060	
Fred Stern & Co......	London	New York	380,340	
Aldens' Successors, Inc.	London	New York	58,680	
Various	London	New York	339,380	1,535,560
FEBRUARY 4. By the S. S. *Irishman*, at New York.				
The B. F. Goodrich Co.	London	Akron	422,820	
Fred Stern & Co.......	London	New York	83,340	
Thornett & Fehr.......	London	New York	1,800	
General Rubber Co.....	London	New York	633,240	
Konig Bros. & Co......	London	New York	291,960	
R. F. Downing & Co....	London	New York	169,740	
Aldens' Successors, Inc.	London	New York	1,585,439	
Various	London	New York	1,049,221	4,237,560
FEBRUARY 5. By the S. S. *Arabia Maru*, at New York.				
Aldens' Successors, Inc.	Yokohama	New York	56,560	56,560
FEBRUARY 9. By the S. S. *Eurymedon*, at New York.				
William H. Stiles & Co..	Singapore	New York	89,600	
Aldens' Successors, Inc.	Singapore	New York	30,078	119,678

	Shipment from:	Shipped to:	Pounds.	Totals.
FEBRUARY [illegible]. By the S. S. [illegible], at New York.				
Baring Bros.	Liverpool	New York	10,950	
Earle Bros.	Liverpool	New York	1,800	
Goldman, Sachs & Co...	Liverpool	New York	14,100	
Konig Bros. & Co......	Liverpool	New York	35,250	
Balfour, Williamson & Co.	Liverpool	New York	7,950	
Various	Liverpool	New York	70,800	140,850
FEBRUARY [illegible]. By the S. S. Empress of Asia, at New York.				
Edward Boustead & Co..	Penang	Akron	84,800	84,800
FEBRUARY [illegible]. By the S. S. [illegible], at New York.				
Various	Colombo	New York	180,360	180,360
FEBRUARY [illegible]. By the S. S. [illegible], at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	803,800	
Gaston, Williams & Wigmore	Singapore	New York	18,360	
Edward Maurer Co., Inc.	Singapore	New York	40,500	
W. T. Sargent & Sons.	Singapore	New York	53,100	
Adolph Hirsch & Co....	Singapore	New York	27,540	
Everett Heaney & Co....	Singapore	New York	48,060	
The Fisk Rubber Co....	Singapore	New York	171,720	
Chas. T. Wilson & Co., Inc.	Singapore	New York	118,260	
F. R. Henderson & Co..	Singapore	New York	962,560	
Thornett & Fehr, Inc...	Singapore	New York	158,220	
American Trading Co...	Singapore	New York	28,800	
A. G. De Sherbinin & Co.	Singapore	New York	86,280	
J. T. Johnstone & Co., Inc.	Singapore	New York	188,640	
Mitsui & Co., Limited...	Singapore	New York	90,720	
Hadden & Co..	Singapore	New York	345,600	
Rubber Importers' & Dealers' Co., Inc.....	Singapore	New York	586,260	
Hood Rubber Co.......	Singapore	Watertown	216,000	
Williams Shipping Agency	Singapore	New York	869,040	
Poel & Kelly..........	Singapore	New York	278,460	
Balfour, Williamson & Co.	Singapore	New York	47,960	
William H. Stiles & Co.	Singapore	New York	130,100	
Meyer & Brown, Inc....	Singapore	New York	539,840	
Pell & Dumont, Inc....	Singapore	New York	52,020	
Fred Stern & Co......	Singapore	New York	84,060	
Thos. A. Desmond & Co.	Singapore	New York	101,340	6,041,240
FEBRUARY 12. By the S. S. Monteagle, at New York.				
United States Rubber Co.	Hongkong	New York	357,300	357,300
FEBRUARY 13. By the S. S. Belgic, at New York.				
Aldens' Successors, Inc.	Liverpool	New York	44,460	
Baring Bros.	Liverpool	New York	4,860	49,320
FEBRUARY 13. By the S. S. City of New Castle, at New York.				
F. R. Henderson & Co..	Singapore	New York	383,040	
Fred Stern & Co.......	Singapore	New York	493,380	
L. Littlejohn & Co., Inc.	Singapore	New York	994,860	
Chas. T. Wilson Co., Inc.	Singapore	New York	93,500	
Pacific Trading Corp. of America	Singapore	New York	91,620	
United Malaysian Rubber Co., Ltd.	Singapore	New York	10,260	
The Fisk Rubber Co....	Singapore	Chicopee Falls	341,820	
Robinson & Co.........	Singapore	New York	86,760	
Rogers-Pyatt Shellac Co.	Singapore	New York	158,400	
Poel & Kelly..........	Singapore	New York	358,380	
J. T. Johnstone & Co., Inc.	Singapore	New York	30,240	
Balfour, Williamson & Co.	Singapore	New York	50,400	
Pell & Dumont, Inc. ...	Singapore	New York	20,160	
United States Rubber Co.	Singapore	New York	939,780	
Rubber Importers' & Dealers' Co., Inc.....	Singapore	New York	468,180	
Smith & Schippers......	Singapore	New York	3,600	
Aldens' Successors, Inc.	Singapore	New York	480,396	
Rubber Trading Co....	Singapore	New York	85,500	
Meyer & Brown, Inc...	Singapore	New York	22,400	
Edward Maurer Co., Inc.	Singapore	New York	72,180	
Thos. A. Desmond & Co.	Singapore	New York	254,160	
The Goodyear Tire & Rubber Co.	Singapore	Akron	158,580	
Hadden & Co..........	Singapore	New York	292,320	
Boston Insulated Wire & Cable Co..........	Singapore	Dorchester	5,400	
American Trading Co..	Singapore	New York	93,240	
A. G. De Sherbinin & Co.	Singapore	New York	125,280	
William H. Stiles & Co.	Singapore	New York	268,800	
F. Bossevain & Co.....	Singapore	New York	54,360	
Goldman, Sachs & Co...	Singapore	New York	42,480	
X. W. Obalski & Co., Inc.	Singapore	New York	30,360	
The B. F. Goodrich Co.	Singapore	Akron	585,900	
Swinehart Tire & Rubber Co.	Singapore	Akron	52,920	
Pennsylvania Rubber Co.	Singapore	New York	40,320	
Hood Rubber Co........	Singapore	Watertown	27,000	
Thornett & Fehr, Inc...	Deli	New York	12,960	
Edward Maurer Co., Inc.	Deli	New York	18,000	
Poel & Kelly..........	Deli	New York	23,040	
J. T. Johnstone & Co., Inc.	Deli	New York	109,260	
American Metal Co.....	Deli	New York	58,680	
Mitsui & Co., Limited..	Deli	New York	44,640	
F. R. Henderson & Co..	Deli	New York	44,820	
Harrisons & Crosfield, Limited	Deli	New York	102,960	
Various	Singapore	New York	793,080	
Various	Malacca	New York	3,960	8,427,376
FEBRUARY 16. By the S. S. Kabinga, at New York.				
The Goodyear Tire & Rubber Co.	Colombo	Akron	424,080	
Chas. T. Wilson, Inc...	Colombo	New York	381,240	
Aldens' Successors, Inc.	Colombo	New York	11,200	
Various	Colombo	New York	453,780	
Harrisons & Crosfield, Limited	Cochin	New York	216,720	
Various	Cochin	New York	63,180	1,550,200
FEBRUARY 16. By the S. S. New Amsterdam, at New York.				
Poel & Kelly..........	Rotterdam	New York	134,100	
Pablo Calvet & Co.....	Rotterdam	New York	540,000	
Weise & Co...........	Rotterdam	New York	298,980	
Meyer & Brown, Inc...	Rotterdam	New York	67,200	
Aldens' Successors, Inc.	Rotterdam	New York	129,582	1,169,862
FEBRUARY 17. By the S. S. Port Lyttleton, at New York.				
Aldens' Successors, Inc.	Liverpool	New York	1,223,809	
General Rubber Co.....	Liverpool	New York	635,580	
Adolph Hirsch & Co....	Liverpool	New York	309,420	
Meyer & Brown, Inc....	Liverpool	New York	112,000	
Various	....	....	1,136,480	3,417,289
FEBRUARY 18. By the S. S. Kiso Maru, at San Francisco.				
Firestone Tire & Rubber Co.	Singapore	Akron	393,460	393,460
FEBRUARY 19. By the S. S. Michigan, at New York.				
Fred Stern & Co......	London	New York	17,280	
Balfour, Williamson & Co.	London	New York	20,700	
Various	London	New York	360	38,340
FEBRUARY 20. By the S. S. Empress of Japan, at Vancouver.				
Meyer & Brown, Inc...	Singapore	Vancouver	100,800	100,800
FEBRUARY 20. By the S. S. Valacia, at New York.				
Poel & Kelly...........	London	New York	386,460	
Various	London	New York	390,900	777,360
FEBRUARY 24. By the S. S. Valdura, at New York.				
Various	London	New York	100,440	100,440
FEBRUARY 24. By the S. S. East India, at New York.				
R. F. Downing & Co....	London	New York	186,300	
Mitsui & Co., Limited..	London	New York	192,600	
W. R. Grace & Co.....	London	New York	10,980	
Thornett & Fehr, Inc...	London	New York	360	390,240
FEBRUARY 20. By the S. S. Slavic Prince, at New York.				
William H. Stiles & Co.	Singapore	New York	156,800	
Aldens' Successors, Inc.	Singapore	New York	22,400	
Edward Maurer Co., Inc.	Singapore	New York	59,080	
Gaston, Williams & Wigmore	Singapore	New York	64,080	
L. Littlejohn & Co., Inc.	Singapore	New York	568,080	
Fred Stern & Co.......	Singapore	New York	1,124,640	
Balfour, Williamson & Co.	Singapore	New York	431,460	
F. R. Henderson & Co..	Singapore	New York	151,740	
Robinson & Co.........	Singapore	New York	28,200	
Poel & Kelly..........	Singapore	New York	806,220	
Edward Bousted & Co..	Singapore	New York	73,000	
The Fisk Rubber Co...	Singapore	Chicopee Falls	82,800	
Chas. T. Wilson Co., Inc.	Singapore	New York	98,100	
Hadden & Co..........	Singapore	New York	184,320	
East Asiatic Co., Inc...	Singapore	New York	144,900	
Rogers-Pyatt Shellac Co.	Singapore	New York	181,800	
J. T. Johnstone & Co., Inc.	Singapore	New York	72,360	
Rubber Trading Co.	Singapore	New York	48,960	
Thos. A. Desmond & Co.	Singapore	New York	151,380	
Rubber Importers' & Dealers' Co., Inc.....	Singapore	New York	273,780	
Thornett & Fehr, Inc...	Singapore	New York	70,560	
Hood Rubber Co.......	Singapore	Watertown	5,400	
Pacific Trading Corp. of America	Penang	New York	112,500	
W. R. Grace & Co.....	Penang	New York	11,160	
Various	Singapore	New York	846,900	
Various	Penang	New York	180,720	5,951,340
FEBRUARY 24. By the S. S. Karimoen, at New York.				
General Rubber Co.....	T'jong Priok	New York	636,660	
The Fisk Rubber Co....	T'jong Priok	Chicopee Falls	299,700	
Poel & Kelly..........	T'jong Priok	New York	42,480	
L. Sutro & Co.........	T'jong Priok	New York	75,060	
Harrisons & Crosfield, Limited	T'jong Priok	New York	71,000	
L. Littlejohn & Co., Inc.	T'jong Priok	New York	54,360	
Thornett & Fehr, Inc...	T'jong Priok	New York	9,900	
Rubber Trading Co....	T'jong Priok	New York	108,000	
Vernon Metal & Produce Co.	T'jong Priok	New York	12,060	
Fred Stern & Co.......	T'jong Priok	New York	89,820	
F. R. Henderson & Co..	T'jong Priok	New York	45,000	
Fred Stern & Co.......	Batavia	New York	26,640	
Kuhárah Trading Co., Ltd.	Batavia	New York	93,780	
Manhattan Rubber Mfg. Co.	Batavia	New York	28,800	
F. R. Henderson & Co..	Batavia	New York	393,480	
F. R. Henderson & Co..	Socrabaya	New York	1,800	
L. Littlejohn & Co., Inc.	Soerabaya	New York	346,680	
Edward Maurer Co., Inc.	Soerabaya	New York	37,260	
Gaston, Williams & Wigmore	Soerabaya	New York	127,440	
Mitsui & Co., Limited...	Soerabaya	New York	137,340	
General Rubber Co.....	Soerabaya	New York	3,600	
United Malaysian Rubber Co., Ltd........	Soerabaya	New York	3,467	
Various	Penang	New York	26,100	2,670,427

AFRICANS.

	Shipment from:	Shipped to:	Pounds.	Totals
January 28. By the S. S. *Eglinton*, at New York.				
Various	Paris	New York	40,150	40,150
February 2. By the S. S. *Manchuria*, at New York.				
Various	Antwerp	New York	5,750	5,750
February 3. By the S. S. *Roma*, at New York.				
Thornett & Fehr, Inc.	Marseilles	New York	39,817	
Various	Marseilles	New York	10,925	50,742
February 9. By the S. S. *Mormacar*, at New York.				
Various	Lisbon	New York	223,097	223,097
February 9. By the S. S. *Lebanon*, at New York.				
Various	Bordeaux	New York	318,520	318,520
February 15. By the S. S. *Victorious*, at New York.				
Albert Eyck & Co.	Antwerp	New York	230	
Peel & Kelly	Antwerp	New York	115	345
February 19. By the S. S. *Lapland*, at New York.				
Various	Antwerp	New York	372,385	372,385
February 20. By the S. S. *Britannia*, at New York.				
Various	Marseilles	New York	1,100,580	1,100,580
February 21. By the S. S. *Henry Clay*, at New York.				
Rubber Importers' & Dealers' Co., Inc.	Antwerp	New York	150	150
February 21. By the S. S. *Jacques Cartier*, at New York.				
Poel & Kelly	Havre	New York	69,460	69,460

BALATA.

	Shipment from:	Shipped to:	Pounds.	Totals
January 28. By the S. S. *Manco*, at New York.				
Cowdry & Co.	Brazil	New York	4,950	4,950
February 1. By the S. S. *West Mohno*, at New York.				
Various	Liverpool	New York	1,500	1,500
February 2. By the S. S. *Mayaro*, at New York.				
American Trading Co.	Trinidad	New York	1,500	
Southern Sales Corp.	Trinidad	New York	112,200	
Various	Trinidad	New York	4,675	118,375
February 4. By the S. S. *Irishman*, at New York.				
Earle Bros.	London	New York	3,300	3,300
February 7. By the S. S. *Oranje Nassau*, at New York.				
Wm. Schall & Co.	Paramaribo	New York	4,398	4,398
February 11. By the S. S. *Ancon*, at New York.				
J. S. Sembrada & Co.	Cristobal	New York	900	
Hollingshurst & Co.	Cristobal	New York	2,700	
H. Marquardt & Co.	Cristobal	New York	1,650	5,250
February 16. By the S. S. *Wm. M. Tupper*, at New York.				
E. Wyucta & Co.	Puerto C'mbia	New York	3,200	3,200
February 16. By the S. S. *Maravel*, at New York.				
G. Amsinck & Co., Inc.	Trinidad	New York	12,120	
General Export & Commission Co.	Trinidad	New York	11,160	
Southern Sales Corp.	Trinidad	New York	43,200	
South & Central American Commercial Co.	Trinidad	New York	22,760	
Various	Trinidad	New York	2,880	92,120
February 16. By the S. S. *Panama*, at New York.				
Heilbron, Wolff & Co.	Cristobal	New York	4,200	
G. Amsinck & Co., Inc.	Cristobal	New York	2,700	
Ultramares Corp.	Cristobal	New York	7,200	
American Trading Co.	Cristobal	New York	150	
Merck & Co.	Cristobal	New York	4,140	
J. S. Sembrada & Co.	Cristobal	New York	8,460	26,850
February 20. By the S. S. *Carillo*, at New York.				
Various	Cristobal	New York	900	900

CENTRALS.

	Shipment from:	Shipped to:	Pounds.	Totals
January 30. By the S. S. *General G. W. Goethals*, at New York.				
G. Amsinck & Co., Inc.	Cristobal	New York	21,600	
Ultramares Corp.	Cristobal	New York	10,200	
J. S. Sembrada & Co.	Cristobal	New York	1,515	
W. R. Grace & Co.	Cristobal	New York	300	
Pablo Calvet & Co.	Cristobal	New York	15,000	
Wellman, Peck & Co.	Cristobal	New York	4,800	
T. Thompson & Co.	Cristobal	New York	300	
Various	Cristobal	New York	3,900	57,615
February 1. By the S. S. *General O. H. Ernst*, at New York.				
G. Amsinck & Co., Inc.	Cristobal	New York	3,450	
Pablo Calvet & Co.	Cristobal	New York	10,800	
Otto Gerdan & Co.	Cristobal	New York	66,600	80,850
February 1. By the S. S. *Colon*, at New York.				
G. Amsinck & Co., Inc.	Cristobal	New York	4,500	4,500
February 2. By the S. S. *Mayaro*, at New York.				
Middleton & Co.	Trinidad	New York	4,245	4,245
February 9. By the S. S. *Waconta*, at New York.				
Various	Vera Cruz	New York	4,350	4,350
February 11. By the S. S. *Ancon*, at New York.				
Ultramares Corp.	Cristobal	New York	2,550	
G. Amsinck & Co., Inc.	Cristobal	New York	70,950	
Pablo Calvet & Co.	Cristobal	New York	167,550	
J. S. Sembrada & Co.	Cristobal	New York	1,300	
Hollinghurst & Co.	Cristobal	New York	1,050	
R. Fabian & Co.	Cristobal	New York	600	
Isaac Brandon & Bros.	Cristobal	New York	1,050	
A. M. Capen's Sons, Inc.	Cristobal	New York	5,250	
Mecke & Co.	Cristobal	New York	5,250	
Andean Trading Co.	Cristobal	New York	4,500	
Overseas Corp.	Cristobal	New York	87,450	
Otto Gerdan & Co.	Cristobal	New York	38,550	
P. Nephews & Co.	Cristobal	New York	450	
Demarest Bros.	Cristobal	New York	1,950	
Various	Cristobal	New York	397,480	785,930

	Shipment from	Shipped to	Pounds	Totals
February 16. By the S. S. *Panama*, at New York.				
J. S. Sembrada & Co.	Cristobal	New York	2,418	
William E. Peck & Co.	Cristobal	New York	6,150	
Wm. Scholl & Co.	Cristobal	New York	19,500	
Mecke & Co.	Cristobal	New York	3,750	
American Trading Co.	Cristobal	New York	300	
Heilbron, Wolff & Co.	Cristobal	New York	1,050	
Ultramares Corp.	Cristobal	New York	19,950	
Various	Cristobal	New York	11,250	64,368
February 19. By the S. S. *Mohegan*, at New York.				
Ultramares Corp.	Puerto C'l'bia	New York	89,400	89,400
February 20. By the S. S. *Carillo*, at New York.				
Ultramares Corp.	Cristobal	New York	450	450
February 21. By the S. S. *Gen. W. C. Gorgas*, at New York.				
G. Amsinck & Co., Inc.	Cristobal	New York	7,920	
Pablo Calvet & Co.	Cristobal	New York	33,300	
Various	Cristobal	New York	3,060	44,280

GUAYULE.

	Shipment from	Shipped to	Pounds	Totals
February 17. By rail at Eagle Pass, Texas.				
Continental-Mexican Rubber Co.	Mexico	New York	56,000	56,000
February 17. By rail at Eagle Pass, Texas.				
Continental-Mexican Rubber Co.	Mexico	Akron	55,000	55,000
February 19. By rail at Eagle Pass, Texas.				
Continental-Mexican Rubber Co.	Mexico	New York	58,100	58,100
February 28. By rail at Eagle Pass, Texas.				
Continental-Mexican Rubber Co.	Mexico	Akron	82,500	82,500

PONTIANAK.

	Shipment from	Shipped to	Pounds	Totals
February 9. By the S. S. *Maneric*, at New York.				
Edward Boustead & Co.	Singapore	New York	53,040	53,040
February 13. By the S. S. *City of New Castle*, at New York.				
United Malaysian Rubber Co., Ltd.	Singapore	New York	223,250	
L. Littlejohn & Co., Inc.	Singapore	New York	48,750	
Hadden & Co.	Singapore	New York	98,000	
F. R. Henderson & Co.	Singapore	New York	5,500	
Various	Singapore	New York	74,500	450,000
February 20. By the S. S. *Slavic Prince*, at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	2,700	
Various	Singapore	New York	175,200	177,900
February 14. By the S. S. *Elkhorn*, at San Francisco.				
United Malaysian Rubber Co., Ltd.	Soerabaya	San Fran.	372,476	372,476
February 24. By the S. S. *Karimoen*, at New York.				
United Malaysian Rubber Co., Ltd.	Soerabaya	New York	6,300	
Various	Soerabaya	New York	11,700	18,000

GUTTA PERCHA.

	Shipment from	Shipped to	Pounds	Totals
February 26. By the S. S. *Palatia*, at New York.				
Western Electric Co.	London	New York	1,200	1,200

GUTTA SIAK.

	Shipment from	Shipped to	Pounds	Totals
February 13. By the S. S. *City of New Castle*, at New York.				
United Malaysian Rubber Co., Ltd.	Medan	New York	175,700	175,700
February 14. By the S. S. *New Castle*, at New York.				
United Malaysian Rubber Co., Ltd.	Singapore	New York	447,149	622,849

MANIÇOBA.

	Shipment from	Shipped to	Pounds	Totals
February 2. By the S. S. *Rembrandt*, at New York.				
H. A. Astlett & Co.	Santos	New York	4,620	
Poel & Kelly	Santos	New York	101,420	
Hagemeyer & Brunn	Santos	New York	8,140	
General Rubber Co.	Santos	Kitchener	13,860	
General Rubber Co.	Santos	Montreal	9,240	
Various	Santos	New York	251,640	388,920
February 16. By the S. S. *Maraval*, at New York.				
Southern Sales Corp.	Trinidad	New York	540	540

ANTWERP RUBBER ARRIVALS.

January 19. By the S. S. *Anversville*, from the Congo.

Société Anonyme Bungé (Comptoir Commercial Belgique)	kilos	6,332
Société Anonyme Bungé (Belgika)		8,280
Société Anonyme Bungé (Combination)		11,683
Société Anonyme Bungé		20,241
Société Coloniale Anversoise (Compagnie du Kassai)		18,940
Société Coloniale Anversoise (S. A. B.)		4,601
Various		40,295
Total	kilos	110,[illegible]

February 3, 1920. By the steamer *Matadi* from the Congo.

Bungé & Co.	kilos	51,224
Société Coloniale Anversoise (Chemins de Fer du Haut Congo)		9,730
Crédit Coloniale et Commercial (Kassai), (formerly L. & W. Van der Velde)		84,230
Others		10,377
Total	kilos	155,561

(Compiled by [illegible])

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES, DURING THE MONTH OF DECEMBER, 1919.

Exported to	Belting, Hose and Packing Value.	Boots. Pairs.	Boots. Value.	Shoes. Pairs.	Shoes. Value.	Druggists' Rubber Sundries. Value.	Tires. Automobiles. Value.	Tires. All Others. Value.	Insulated Wire and Cables. Value.	All Other Manufactures of Rubber. Value.	Totals. Value.
Europe:											
Austria-Hungary	$128						$10,800			$2,477	$13,405
Azores and Madeira Islands									$22		22
Belgium	1,288	2	$4	6,435	$5,525	$55	84,467	$2,656	$28,306	4,516	126,817
Denmark	27	508	4,038	76,677	53,591	30	189,939	8,453	3,468	16,657	276,203
France	1,575	33	155	30,764	24,565	10,793	208,638	8,109	11,038	55,630	320,503
Germany	43	1	4	7	13	1,200	32,719	27		24	34,030
Greece				719	818		28,129		1,920	3,095	33,962
Iceland and Faroe Islands		1,449	2,820	24	21	50	701		1,344	43	4,979
Italy	1,482			13,350	18,677	441	82,528		13,134	6,852	123,114
Malta, Gozo and Cyprus Islands		22	59							1,150	1,209
Netherlands	5,769			23,507	21,391	306	186,139	20,416	26,702	6,995	267,718
Norway	41	5,424	11,300	172,539	151,658	3,283	71,323	5,889	84,622	6,866	334,982
Portugal	50	12	78	81	64		19,214	879		1,254	21,539
Roumania	14			3,348	5,600		23,972			80	29,666
Russia in Europe	8,400	2	12	360	253		1,250		2,258	209	12,382
Spain	1,541	60	300	4,068	3,310	2,278	118,981	994	16,416	16,384	160,204
Sweden	542						54,628			267	55,437
Switzerland		48	72	64,664	41,303	130	81,461		5,322	11,577	139,865
Turkey in Europe				206,164	158,116	28	32		65	600	158,841
England	60,904	2,396	4,323	68,925	45,465	16,194	340,998	44,717	17,991	106,693	637,285
Scotland	50			3,600	2,731	72	65				2,918
Ireland										415	415
Totals, Europe	$81,854	9,957	$23,165	675,232	$533,101	$34,860	$1,535.984	$92.140	$212,608	$241,784	$2,755,496
North America:											
Bermuda	$189	9	$37	177	$148		$10.326		$4,405	$619	$15,724
British Honduras	4			2,794	2,365		400	510	185	92	3,056
Canada	56,510	3,835	12,037	5,760	7,455	$23,225	67,412	3,843	24,995	253,040	448,517
Costa Rica	560			18	14	243	1,715	22	493	1,615	4,602
Guatemala	468					30		24	2,570	141	3,233
Honduras	1,089			310	394	982	1,787	278	40	380	4,950
Nicaragua	1,346			916	683	202	2,810	14	332	1,967	7,354
Panama	6,376			144	92	865	24.589	2.540	7,707	2,175	44,294
Salvador	93			144	80	917	4.793		245	829	6,957
Mexico	66,257	19	107	2,729	2,692	12.239	71,369	9,130	21,852	26,916	210,562
Miquelon, Langley, etc.		370	647	96	63						710
Newfoundland and Labrador	1,801	4,726	13,662	7,407	9,147	10	3,316	73	369	6,995	35,373
Barbados				196	144		647			96	887
Jamaica	532			360	313	61	13,825	306	404	969	16,410
Trinidad and Tobago	2,663			566	470	1,100	14,841	749	141	217	20,181
Other British West Indies	46			925	783	72	1,031	516	201	307	2,956
Cuba	49,760	6	23	20,804	19,509	6,987	202,254	16,656	50,458	33,969	379,616
Danish West Indies	232						963	8	54	280	1,537
Dutch West Indies	2,776			102	56		217			66	3,115
French West Indies	142			53	70	15	2,138	153	210	136	2,864
Haiti	83			4	3	15	8,073	9	149	342	8,674
Dominican Republic	1,608			72	58	97	4,225	581	596	1,495	8,660
Totals, North America	$192,425	8,965	$26,513	43,577	$44,539	$47,060	$436,731	$34,912	$115,406	$332,646	$1,230,232
South America:											
Argentina	$7.179			5,947	$5,923	$3,198	$41.266	$70	$10,705	$38,650	$106,991
Bolivia	1,582					95	2,250			105	4,032
Brazil	9,975			28,039	23,049	2,227	121,452	642	47,394	18,640	223,379
Chile	11,264			2,237	1,810	2,712	22,529	1,061	25,105	21,862	86,343
Colombia	1,059			171	170	1,254	14,223	559	5,189	3,809	26,263
Ecuador				592	455	514	490		328	166	1,953
British Guiana	50			28	22		1,462		58	623	2,215
Dutch Guiana							100			81	181
Paraguay	2,701										2,701
Peru	6,081					170	17,756		26,577	2,934	53,518
Uruguay				250	244	359	26,536		1,363	1,976	30,478
Venezuela	833					927	5,823	170	255	2,795	10,803
Totals, South America	$40,724			37,264	$31,673	$11,456	$253,887	$2,502	$116,974	$91,641	$548,857
Asia:											
China	$323			6,004	$9,005	$253	$1,113	$1,026	$2,469	$2,582	$16,771
Japanese China							425				425
Chosen				343	313		145			117	575
British India	5,027			858	704	1,474	93.850	4,723	16,413	8,322	130,513
Straits Settlements	1,853					156	75.387			6.052	83,448
Other British East Indies	665						1,809		615	8	3,097
Dutch East Indies	577			1	2	17	27,150		3,669	1,709	33,124
French East Indies						167		270			437
Hongkong	38			221	424		733	687	51	655	2,588
Japan	14,834	2,292	$5,377	33,090	33.376	47	4,353	507	13,883	17,498	89,875
Russia in Asia				3,072	3,389						3,389
Siam						280					280
Turkey in Asia				6,459	6,169		156			635	6,960
Totals, Asia	$23,317	2,292	$5,377	50,048	$53,382	$2,394	$205,121	$7,213	$37,100	$37,578	$371,482
Oceania:											
Australia	$22,251			3,818	$3,862	$3,107	$81,663	$711	$1,438	$22,584	$135,616
New Zealand	8,106	264	$1,690	197	179	1,091	82,448	4,292	443	6,166	104,415
Other British Oceania									409	131	540
French Oceania	183						813	584	40	35	1,655
German Oceania				58	79		1,029	70		520	1,698
Philippine Islands	2,892			386	700	1,867	79.968	2,653	12,274	6,393	106,747
Totals, Oceania	$33,432	264	$1,690	4,459	$4,820	$6.065	$245,921	$8,310	$14,604	$35,829	$350,671
Africa:											
Belgian Kongo										$50	$50
British West Africa	63.261						6,592			463	70,316
British South Africa		300	1,248	1,189	1,314	1,937	68.797	2,829	2,252	18,876	97,253
British East Africa							1,080				1,080
Canary Islands							576				576
French Africa	449						8,325			127	8,901
Italian	79										79
Morocco				300	255						255
Portuguese Africa							150	125	371	55	701
Egypt	475						441			2,964	3,880
Totals, Africa	$64.264	300	$1,248	1,489	$1,569	$1,937	$85,961	$2.954	$2,623	$22 535	$183.091
Totals	$436,016	21,778	$57,993	812.069	$669,084	$103,772	$2,763,605	$148,031	$499,315	$762,013	$5,439,829

SHIPMENTS TO NON-CONTIGUOUS TERRITORY.

Exported to—	Belting Hose and Packing.	Boots and Shoes. Pairs.	Boots and Shoes. Value.	Druggists' Rubber Sundries. Value.	Tires. Automobiles. Value.	Tires. All Others. Value.	Insulated Wire and Cables. Value.	All Other Manufactures of Rubber. Value.	Totals. Value.
Hawaii	$16,760	2,767	$5,149	......	$169,075	$1,590	......	$15,[illegible]	$[illegible],517
Porto Rico	3,086	887	850	....	51,840	1,172	......	12,211	69,159
Totals	$19,842	3,654	$5,999	......	$220,915	$2,762	......	$28,154	$277,676

(Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.)

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	Twelve Months Ended December 31			
	1918.		1919.	
Unmanufactured—*free*: India rubber:	Pounds.	Value.	Pounds.	Value.
From France	169,318	$72,406	2,410,319	$752,579
Netherlands	....	....	2,637,665	1,276,060
Portugal	424,424	152,362	87,422	24,470
United Kingdom	6,627,165	3,723,993	60,251,894	28,687,500
Canada	2,712,336	1,314,386	5,320,540	2,530,295
Central America	387,144	143,033	448,827	152,416
Mexico	2,185,809	850,123	963,242	306,307
Brazil	40,332,620	13,378,588	58,845,384	20,828,269
Peru	1,373,751	489,146	4,567,002	1,501,854
Other South America	2,216,993	873,914	2,398,750	1,000,962
British E. Indies	227,695,805	104,973,396	329,624,236	131,652,143
Dutch E. Indies	37,344,813	18,204,689	61,260,330	24,600,493
Other countries	4,489,130	2,202,277	7,124,810	2,507,035
Totals	325,959,308	$146,378,313	535,940,421	$215,820,383
Balata	1,547,338	$836,383	1,628,134	$937,038
Guayule	1,376,085	413,484	3,204,224	760,690
Jelutong (Pontianak)	9,932,476	683,551	18,662,702	2,213,964
Gutta percha	1,207,980	225,992	6,495,818	1,068,693
Totals	14,063,885	$2,159,410	29,990,878	$4,980,390
Rubber scrap	8,526,420	645,581	10,777,225	825,619
Totals, unmanufactured	348,549,613	$149,183,304	576,708,524	$221,626,392
Chicle (dutiable)	7,251,022	$3,917,104	9,445,538	$6,216,987
Manufactured—*dutiable*:				
India ruber and gutta-percha	....	$445,322	....	$956,085
India rubber substitutes	....	383,497	392,092	47,966

EXPORTS OF DOMESTIC MERCHANDISE.

	1918. Pounds.	1918. Value.	1919. Pounds.	1919. Value.
Manufactured—				
Automobile tires[1]	....	$14,511,621	....	$28,924,685
All other tires[1]	....	755,888	....	1,557,201
Scrap and old	2,931,929	287,883	8,291,853	808,993
Reclaimed	2,904,234	502,176	5,070,632	839,938
Belting, hose and packing[1]	....	4,525,243	....	6,100,460
Suspenders and garters	....	1,185,985	....	2,551,858
Boots[1] ...... *pairs*	772,856	2,799,116	261,110	714,713
Shoes[1] ...... *pairs*	1,285,110	1,584,747	5,794,488	4,551,386
Druggists' rubber sundries[1]	....	772,539	....	1,270,506
Insulated wire and cables[1]	....	5,604,929	....	8,815,212
Other rubber manufactures[1]	....	5,762,079	....	9,097,773
Totals manufactured	.....	$38,[illegible]	......	$65,232,725
Fountain pens... *number*	161,399	$123,952	423,906	$409,517

EXPORTS OF FOREIGN MERCHANDISE.

	1918. Pounds.	1918. Value.	1919. Pounds.	1919. Value.
Unmanufactured—				
India rubber	6,150,755	$3,133,622	5,111,786	$2,205,629
Balata	706,185	436,252	351,477	206,118
Guayule	9,778	2,936	2,210	621
Jelutong (Pontianak)	73,868	9,756	163,034	26,875
Gutta-percha	126,731	29,015	12,655	3,611
Rubber scrap	58,574	16,032	1,870	206
Totals, unmanufactured	7,125,891	$3,627,613	5,643,032	$2,443 060
Manufactured—				
India Rubber	....	$25,901	....	....
Gutta-percha	....	14,200	....	$39,743
Totals, manufactured	....	$40,101	....	$39,743
Chicle	76,753	44,831	268,790	$155,239

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

	Twelve Months Ended December 31.			
	1918.		1919.	
	Pounds.	Value.	Pounds.	Value.
Manufactured—				
To Alaska:				
Belting, hose and packing	....	$99,719	....	$114,711
Boots and shoes, *pairs*	69,096	183,757	76,995	200,344
Other rubber goods	....	62,601	....	50,997
Totals	......	$346,077	......	$366,052
To Hawaii:				
Belting, hose and packing	....	$89,207	....	$119,180
Automobile tires	....	963,329	....	1,135,412
Other tires	....	33,552	....	38,450
Other rubber goods	....	143,733	....	159,886
Totals	....	$1.228,821	....	$1,462,928
To Porto Rico:				
Belting, hose and packing	....	$51,058	....	$57,212
Automobile tires	....	812,444	....	867,457
Other tires	....	12,947	....	33,742
Other rubber goods	....	104,827	....	196,721
Totals	....	$981,276	....	$1,155,132
To Philippine Islands:				
Belting, hose and packing	....	$213,517	...	$279,282
Boots and shoes, *pairs*	188,928	152,835	154,624	149,189
Tires	1,115,737	....	....	1,498,066
Other rubber goods	277,806	....	....	463.660
Totals	......	$366,352	......	$2,390,197

[1] Details of exports of domestic merchandise by countries during December are given on pages 396-397 of this issue

RUBBER STATISTICS FOR THE DOMINION OF CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	November.			
	1918.		1919.	
Unmanufactured—*free*:	Pounds.	Value.	Pounds.	Value.
Rubber, gutta percha, etc.:				
From United Kingdom	54,604	$24,172	779,359	$410,096
United States	155,833	56,325	197,309	86,237
Brazil	108,592	40,364	28,600	20,413
British East Indies:				
Ceylon	18,194	11,695	....	....
Straits Settlements	453,826	209,198	1,048,723	457,147
New Zealand	1,324	940	....	....
Totals	792,373	$342,694	2,053,991	$973,893
Rubber, recovered	431,759	54,003	347,521	59,178
Hard rubber sheets and rods	2,540	2,581	12,844	3,579
Hard rubber tubes	....	950	....	1,666
Rubber, powdered, and rubber or gutta percha scrap	61,209	13,598	354,672	44,468
Rubber thread, not covered	2,420	3,520	2,659	3,879
Rubber substitute	134,942	12,901	135,236	15,512
Totals, unmanufactured	632,870	$87,553	852,932	$128,282
Balata	[illegible]	29	1	....
Chicle	41,812	28,852	151,203	94,767
Manufactured—*dutiable*:				
Boots and shoes	....	$15,349	....	$36,561
Waterproofed clothing	....	4,414	....	17,290
Belting, hose and packing	....	35,251	....	32,214
Gloves, and hot-water bottles	....	(*)	....	4,020
Fountain pens	.....	(†)	....	10,012
Tires	....	35,373	....	38,584
Insulated wire and cables:				
Wire and cables, covered with cotton, linen, silk, rubber, etc	....	10,233	....	14,575
Copper wire and cables, covered as above	....	(‡)	....	9,779
Other manufactures	......	151,600	......	210,760
Totals, manufactured	....	$222,220	....	$373,805

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	November.			
	1918.		1919.	
	Produce of Canada.	Reexports of Foreign Goods	Produce of Canada.	Reexports of Foreign Goods.
Unmanufactured—	Value.	Value.	Value.	Value.
Crude and waste rubber	$14,654	....	$30,273	$16,373
Manufactured—				
Hose	4,624	.....	17,295	......
Boots and shoes	84,352	860	214,658	131
Clothing	1,141	......	9,488	27
Tires	385,815	8,139	322,274	2,046
Belting	83	.....	245	......
All other—n. o. p.	3,220	2,273	13,625	2,236
Totals, manufactured	$479,235	$10,472	$577,585	$4,440
Chicle	....	....	37,985	....

*Included in "Other manufactures."
†Included in "Pens of all kinds."
‡Included in "Wire and cables," etc.

UNITED KINGDOM RUBBER STATISTICS.

IMPORTS.

	December.			
	1918.		1919.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED—				
Crude rubber:				
From—				
Dutch East Indies	1,119	£13,676	25,088	£300,694
French West Africa	573	6,0[illegible]	......	......
Gold Coast	2,777	26,41[illegible]	480	3,156
Other African countries	12,045	100,502	3,880	33,994
Peru	1,617	21,154	216	2,510
Brazil	12,285	158,454	12,778	154,993
British India	9,956	115,880	14,908	180,042
Straits Settlements	74,454	769,154	54,204	633,641
Federated Malay States	5,245	60,870	63,520	753,366
Ceylon and dependencies	10,699	127,747	43,913	519,123
Other countries	......	......	6,245	72,325
Totals	130,771	£1,399,878	225.232	£2,653,844
Waste and reclaimed rubber	......	.	6,966	20,123
Totals, unmanufactured	130,771	£1,399,878	232.198	£2,673,967
Gutta percha	11,941	£254,072	13,057	£240,870
MANUFACTURED—				
Boots and shoes. *dozen pairs*	672	£4,907	14,096	£27,055
Waterproofed clothing	......	......	......	3,809
Automobile tires and tubes	......	47,248	......	322,205
Motorcycle tires and tubes	..	[illegible]		3,674
Carriage tires and tubes	...	...	..	771
Bicycle tires and tubes	...	......	..	9,612
Insulated wire	..	3,426	....	447
Submarine cables	.	..		......
Totals	.	£55,907		£367,673

EXPORTS.

UNMANUFACTURED				
Waste and reclaimed rubber	4,941	£9,681	9,679	£23,146
MANUFACTURED—				
Waterproofed clothing	......	40,722	......	242,702
Boot and shoes. . *dozen pairs*	9,577	13,961	15,167	34,504
Insulated wire	......	20,975	.	97,487
Submarine cables	.....	106,490	...	78,070
Carriage tires and tubes	..	13,045	.	19,900
Bicycle tires and tubes	.	26,360	...	114,386
Automobile tires and tubes		79,171	...	238,287
Motorcycle tires and tubes		15,095	.	27,909
Other rubber manufactures	..	122,967	...	292,851
Totals	......	£398,786	......	£1,146,096

EXPORTS—COLONIAL AND FOREIGN.

UNMANUFACTURED—				
Crude rubber				
To Russia	....	.....	101	£820
Belgium	..	......	7,274	77,126
France	10,806	£126,739	19,710	226,305
Italy	6,900	79,995	5,149	53,787
United States of America	......	......	141,320	1,707,452
Other countries	1,675	24,711	18,613	216,040
Total	19,381	£231,445	192,167	£2,281,530
Waste and reclaimed	......		879	3,222
Totals, unmanufactured	19,381	£231,455	193,046	£2,284,752
Gutta percha	.....	...	2,869	£51,207
MANUFACTURED				
Boots and shoes. . *dozen pairs*	461	£893	143	£4,871
Waterproof clothing	......	.....	......	34
Insulated wire	......	.....	......	......
Automobile tires and tubes	......	3,307	......	1,656
Motorcycle tires and tubes	..	..		87
Bicycle tires and tubes		56	.....	......
Totals	....	£4,256	......	£6,648

THE MARKET FOR RUBBER SCRAP.

NEW YORK.

THERE has been a steady demand for shoe and tire scrap from the reclaimers who are operating at capacity in most standard grades.

The price of shoes is somewhat easier than last month. The unusually heavy snow of the past month has depleted stocks of rubber footwear and this enormous consumption of new goods will have a marked effect in increasing the spring collections. The spring collection of tires is due in two months and will be of larger than usual proportions.

The price of crude is but slightly affecting that of scrap

The most important factor in the scrap rubber market has been the difficulty of making shipments. The heavy weather has embargoed practically all consuming points. Dealers thus being unable to move their stocks freely either inward or outward. This situation has resulted in lower price offerings by the dealers.

Figures compiled by the National Automobile Chamber of Commerce indicate that the scrap tires produced in 1920 will total a net rubber content of 96,000 tons, scrap tubes for 1920 will net 20,000 tons, a total of 116,000 tons rubber scrap resulting from 1920 expansion in the automobile industry. Some dealers look with concern upon this output while others optimistically consider it affords an opportunity for them to do a bigger business than ever, possibly on a new scale of prices.

QUOTATIONS FOR CARLOAD LOTS DELIVERED.

February 25, 1920.

Prices subject to change without notice.

BOOTS AND SHOES:				
Arctic tops	*lb.*	$0.01	@	
Boots and shoes	*lb.*	.08⅜	@	.08½
Trimmed arctics	*lb.*	.06¾	@	.07
Untrimmed arctics	*lb.*	.05¾	@	.06
HARD RUBBER:				
Battery jars, black compound	*lb.*	.01	@	
No. 1, bright fracture	*lb.*	.23	@	.24
INNER TUBES:				
No. 1, old packing	*lb.*	.18	@	.18½
No. 2	*lb.*	.10	@	.10¼
Red	*lb.*	.09½	@	.09¾
MECHANICALS:				
Black scrap, mixed, No. 1	*lb.*	.03½	@	.04
No. 2	*lb.*	.03	@	
Car springs	*lb.*	.03½	@	.04
Heels	*lb.*	.03	@	.03½
Horse-shoe pads	*lb.*	.03	@	.03½
Hose, air brake	*lb.*	.04¼	@	
fire, cotton lined	*lb.*	.01½	@	.01¾
garden	*lb.*	.01½	@	.01¾
Insulated wire stripping, free from fiber	*lb.*	.03½	@	.04
Matting	*lb.*	.01¼	@	.01½
Red packing	*lb.*	.05½	@	.06
Red scrap, No. 1	*lb.*	.09	@	.10
No. 2	*lb.*	.06¾	@	.07¼
White scrap No. 2	*lb.*	.08	@	.09
No. 1	*lb.*	.10	@	.11
TIRES:				
PNEUMATIC—				
Auto peelings, No. 1	*lb.*	.06¾	@	.07¾
No. 2	*lb.*	.04¾	@	.05¼
Bicycle	*lb.*	.02¾	@	.03
Standard white auto	*lb.*	.04⅝	@	.04¾
Standard mixed auto	*lb.*	.03¾	@	
Stripped, unguaranteed	*lb.*	.02¾	@	
White, G. & G., M. & W., and U. S.	*lb.*	.04¾	@	.05
SOLID—				
Carriage	*lb.*	.04	@	.04¼
Irony	*lb.*	.01	@	
Truck	*lb.*	.03½	@	.03¾

THE MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

AMERICAN COTTON. Though the variations in prices amounted to 255 points, the market for cotton remained extraordinarily dull throughout February, "no sales" being recorded day after day for three weeks. On February 2, the spot price for middling uplands cotton was 39.50 cents; it declined day by day to 37.55 cents, rose slightly and hung around 38 cents for a week, then rose slowly to 39.35 cents on February 24 and 40.10 cents on February 25.

EGYPTIAN COTTON. The market for Egyptian cotton has been rather erratic, with violent fluctuations, but this has not seriously affected the actual sales. Conditions are much as they were last month, though prices have gone up somewhat. High grade Sakel is worth $1.50 a pound and upper Egypts 8 or 10 cents a pound less.

ARIZONA COTTON. This is selling now at $1.00 a pound for medium grades and little of it is to be had. The number of bales on hand is less than 3,000. The quality of the Arizona cotton makes it more desirable for the purposes of American manufacturers than the Egyptian. It has been figured that the

world's supply of long staple cotton will not fill the demands of the tire manufacturers.

SEA ISLAND COTTON. So little of this is left that it may as well be left out of account; it does not amount to more than 3,000 bales. Some has been sold recently at $1.00 a pound for selected average extra choice. Some mills have given up Sea Island entirely and turned to Egyptian.

DUCKS AND DRILLS. The demand has been active and manufacturers have had nothing to offer for prompt delivery.

RAINCOAT CLOTH. The advanced prices in the raincoat trade have been maintained during the month. There has been little or no change in the market and there is absolutely no demand for the goods at the prices asked.

SHEETINGS. While buying during the past two weeks has slackened up very materially, prices have not weakened to any extent. Goods from mills are still hard to obtain.

TIRE FABRICS. The conditions existing since last fall continue and are not likely to change. The product of the mills has been sold out for the whole of 1920. Only futures are offered at absurdly high prices. Some tire manufacturing companies are selling the tire fabrics they have bought at a profit, instead of making tires themselves.

NEW YORK QUOTATIONS.

FEBRUARY 25, 1920

Prices subject to change without notice.

ASBESTOS CLOTH:			
Brake lining, 2½ lbs. sq. yd., brass or copper insertion ... *lb.*	$1.00	@	1.10
2¼ lbs. sq. yd., brass or copper insertion ... *lb.*	1.10	@	1.15
BURLAPS:			
32—7-ounce ... *100 yards*	10.50	@	
32—8-ounce	11.00	@	
40—7½-ounce	11.65	@	
40—8-ounce	11.75	@	
40—10-ounce	17.00	@	
40—10½-ounce	17.25	@	
45—7½-ounce	15.25	@	
45—8-ounce	15.50	@	
48—10-ounce	22.00	@	
DRILLS:			
38-inch 2.00-yard ... *yard*	.43½	@	
40-inch 2.47-yard	.35¼	@	
52-inch 1.90-yard	.55¼	@	
52-inch 1.95-yard	.53⅞	@	
60-inch 1.52-yard	.69¼	@	
DUCK:			
CARRIAGE CLOTH:			
38-inch 2.00-yard enameling duck ... *yard*	.46	@	
38-inch 1.74-yard	.52¾	@	
72-inch 16.66-ounce	1.20¾	@	
72-inch 17.21-ounce	1.23¾	@	
MECHANICAL:			
Hose ... *pound*	.76	@	
Belting	.76	@	
HOLLANDS, 40-INCH:			
Acme ... *yard*		@	
Endurance		@	
Penn		@	
OSNABURGS:			
40-inch 2.35-yard ... *yard*	*.37½	@	
40-inch 2.48-yard	*.35½	@	
37½-inch 2.42-yard	*.36⅜	@	
RAINCOAT FABRICS:			
COTTON:			
Bombazine 64 x 60 ... *yard*	.29	@	
60 x 48	.26	@	
Cashmeres, cotton and wool, 36-inch, tan	1.20	@	
Twills 64 x 72	.46	@	
64 x 102	.48	@	
Twill, mercerized, 36-inch, blue and black	.67½	@	
tan and olive	.65	@	
Tweed	.90	@	1.00
printed	.27½	@	
Plaids 60 x 48	.27	@	
56 x 44	.26	@	
Repp	.45	@	.50
Surface prints 60 x 48	.28	@	
64 x 60	.30	@	
IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING—PLAIN AND FANCIES:			
63-inch, 3½ to 7½ ounces ... *yard*	1.45	@	3.90
36-inch, 2½ to 5 ounces	.85	@	2.25
IMPORTED PLAID LINING (UNION AND COTTON):			
63-inch, 2 to 4 ounces ... *yard*	.95	@	1.90
36-inch, 2 to 4 ounces	[illegible]	@	1.15
DOMESTIC WORSTED FABRICS:			
36-inch, 4½ to 8 ounces ... *yard*	.85	@	1.90
DOMESTIC WOVEN PLAID LININGS (COTTON):			
36-inch, 3¾ to 5 ounces	.27	@	.35
SHEETINGS, 40-INCH:			
48 x 48, 2.35 yard ... *yard*	.36	@	
48 x 48, 2.50 yard	.34	@	
48 x 48, 2.70 yard	.32	@	
48 x 48, 2.85 yard	.31	@	
64 x 68, 3.15 yard	.33	@	
56 x 60, 3.60 yard	.31	@	
SILKS:			
Canton, 38-inch ... *yard*	.75	@	
Schappe, 36-inch	1.00	@	
STOCKINETTES:			
SINGLE THREAD:			
3½ Peeler, carded ... *pound*		@	
4½ Peeler, carded	1.15¼	@	1.15¾
6½ Peeler, combed		@	
DOUBLE THREAD:			
Zero Peeler, carded ... *pound*	.98¼	@	.98½
3½ Peeler, carded	1.04⅛	@	1.04½
6½ Peeler, combed	2.70¼	@	2.70½
TIRE FABRICS:			
BUILDING:			
17¼-ounce Sakellarides, combed ... *pound*	*2.90	@	
17¼-ounce Egyptian, combed	*2.45	@	2.50
17¼-ounce Egyptian, carded	*2.30	@	2.35
17¼-ounce Peelers, combed	*2.25	@	2.35
17¼-ounce Peelers, carded	*1.45	@	1.50
CHAFER:			
9¼-ounce Sea Island ... *pound*		@	
9¼-ounce Egyptian, carded	*2.80	@	
9¼-ounce Peeler, carded	*1.75	@	

*Nominal.

SEA ISLAND CROP MOVEMENT.

FROM AUGUST 1, 1919, TO JANUARY 30, 1920

	Receipts. 1919-20.	1918-19.
Stock on hand, August 1, 1919— Savannah, 4,901; Charleston, 90 .... *bales*	4,991	15,764
Received at Savannah (gross)	5,968	8,951
Received at Charleston	2,643	6,753
Received at Jacksonville	9,377	6,636
Received at Brunswick	......	......
Received at Norfolk	......	......
Total	22,979	38,104
Less exports	20,117	22,836
Stock January 30, 1920 – Savannah, 1,539; Charleston, 1,323	2,862	15,268
Crop in sight at all ports to date	17,988	22,340

EXPORTS.

	To Great Britain.	Continent.	North Mills.	South Mills.	Totals.
From –					
Savannah	...	238	7,707	1,385	9,330
Charleston	...	......	1,410	......	1,410
Jacksonville	...	......	9,377	......	9,377
Brunswick	...	......	......	......	......
Norfolk	...	......	......	......	......
Total	..	238	18,494	1,385	20,117
1918-19	188	......	21,920	728	22,836
	*188	†238	*3,426	†657	†2,719

*Decrease. †Increase.
(*Compiled by John Malloch & Co., Savannah, Georgia.*)

EGYPTIAN COTTON CROP MOVEMENT.

FROM AUGUST 1, 1919, TO DECEMBER 24, 1919.

	1919-1920.	1918-1919.	1917-1918.
To Liverpool .... *bales*	159,793	110,440	101,873
Manchester	87,116	62,674	29,111
Other United Kingdom ports	145	5,537	17,152
Total shipments to Great Britain	247,054	178,651	148,136
To France	21,240	2,318	10,309
Spain	5,730	10,140	1,484
Italy	10,819	23,733	14,954
Belgium	230	....	....
Switzerland	6,690	3,116	....
Holland	190	....	....
Portugal	300	....	....
Germany	150	....	....
Austria	4,943	....	....
Greece	104	3,713	....
Turkey and other countries	73	....	....
Total shipments to Continent	50,469	43,020	26,747
To United States	120,129	11,792	13,530
Japan	8,745	5,520	10,014
Total shipments to all parts	426,397	238,983	198,427
Total crop (interior gross weight), cantars[1].	....	4,826,342	6,315,841

[1]One cantar equals 98 pounds.
(*Compiled by Davies, Benachi & Co.*)

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

NEW YORK.

THE GENERAL CONDITION of short supply continues unrelieved in most lines as was reported for January. Labor, fuel and transportation are the controlling factors in this situation which will become readjusted slowly to the needs of industry generally.

ANILINE OIL. There is very little spot being offered; price 32 to 34 cents per pound.

BARYTES. There is considerable uncertainty in the production situation as regards labor, fuel, etc., which is reflected in limited nearby offerings at $23 to $25 per ton.

BENZOL. The pure grade is quoted at 27 cents and 90 per cent at 23 cents per pound.

DRY COLORS. Prices generally have been firm and latterly in the month were advanced to new levels.

LITHARGE. Production is keeping pace with demand. Prices are very firm with labor cost rising.

LITHOPONE. Output sold far ahead. There is very little spot stock and none for contracts. The price is 7¼ to 7½ cents per pound.

SUBLIMED LEAD. The high price of pig lead has resulted in very firm prices for lead products. The demand for sublimed lead is beyond production capacity.

SULPHUR. There is steady demand at firm prices which remained unchanged the past month.

WHITING. There has been a persistent shortage of chalk importation curtailing output and supporting high firm prices for whiting.

ZINC OXIDE. The demand surpasses all records and production costs are mounting. The various grades are sold well ahead. The item of cooperage is a strong factor in the present high prices.

NEW YORK QUOTATIONS.

FEBRUARY 25, 1920.

Prices subject to change without notice.

ACCELERATORS, ORGANIC.				
Accelerator, N. C. C.	*lb.*	$0.50	@	
Accelerene, New York	*lb.*	4.75	@	
Accelemal	*lb.*	.55	@	
Aldehyde ammonia crystals	*lb.*	1.28	@	1.38
Aniline oil	*lb.*	.32	@	.35
Excellerex	*lb.*	.65	@	.75
Hexamethylene tetramine (powdered)	*lb.*	1.05	@	1.40
Paraphenylenediamine	*lb.*	2.50	@	3.00
Thiocarbanilide	*lb.*	.55	@	
Velosan	*lb.*	3.00	@	
ACCELERATORS, INORGANIC.				
Lead, dry red (bbls.)	*lb.*	.11¾	@	
sublimed blue (bbls.)	*lb.*	.09¼	@	
sublimed white (bbls.)	*lb.*	.09¼	@	
white, basic carbonate (bbls.)	*lb.*	.10	@	
Lime, flour	*lb.*	.02¼	@	.02½
Litharge, domestic	*lb.*	.11¼	@	
sublimed	*lb.*	.11½	@	
imported	*lb.*	.11½	@	.12½
Magnesium, carbonate	*lb.*	.12	@	.13
calcined heavy	*lb.*	.07	@	.09
extra light	*lb.*	.65	@	
light	*lb.*	.35	@	
medium light	*lb.*	.30	@	
Magnesium oxide (extra light)	*lb.*	.63	@	
commercial	*lb.*	.23	@	
Magnesite, calcined	*lb.*	.04	@	
ACIDS.				
Acetic, 28 per cent (bbls.)	*cwt.*	2.75	@	3.00
glacial, 99 per cent (carboys)	*cwt.*	12.00	@	12.50
Cresylic (97% straw color) (drums)	*gal.*	.95	@	1.00
(95% dark) (drums)	*gal.*	.85	@	.95
Muriatic, 20 degrees	*cwt.*	1.75	@	2.00
Nitric, 36 degrees	*cwt.*	6.00	@	6.50
Sulphuric, 66 degrees	*ton*	20.00	@	
ALKALIES				
Caustic soda, 76 per cent (bbls.)	*lb.*	.04½	@	.05½
Soda ash (bbls.)	*lb.*	.03½	@	
COLORS.				
Black:				
Bone, powdered	*lb.*	.06	@	
granulated	*lb.*	.11	@	
Carbon black (sacks, factory)	*lb.*	.19	@	.20
Drop	*lb.*	.09	@	.10
Ivory black	*lb.*	.09	@	.10
Lampblack	*lb.*	.15	@	
Oil soluble aniline	*lb.*	1.25	@	
Rubber black	*lb.*	.08½	@	
Blue:				
Cobalt	*lb.*	.25	@	.35
Prussian	*lb.*	.90	@	
Ultramarine	*lb.*	.18	@	.40
Brown:				
Iron oxide	*lb.*	.03	@	.04
Sienna, Italian, raw and burnt	*lb.*	.05¾	@	.15
Umber, Turkey, raw and burnt	*lb.*	.05½	@	.07½
Vandyke	*lb.*	.02½	@	.03½
Green:				
Chrome, light	*lb.*	.39	@	.50
medium	*lb.*	.40	@	.50
dark	*lb.*	.60	@	
commercial	*lb.*	.15	@	
Oxide of chromium (casks)	*lb.*	.75	@	.90
Red:				
Antimony, crimson, sulphuret of (casks)	*lb.*	.48	@	
crimson, "Mephisto" (casks)	*lb.*	.60	@	
crimson, "R. M. P."	*lb.*	.60	@	
Antimony, golden sulphuret of (casks)	*lb.*	.20	@	
golden sulphuret (States)	*lb.*	*.30	@	.35
golden, "Mephisto" (casks)	*lb.*	.33	@	
golden, "R. M. P."	*lb.*	.33	@	
red sulphuret (States)	*lb.*	*.25	@	
vermilion sulphuret	*lb.*	.55	@	
Arsenic, red sulphide	*lb.*	.18	@	
Indian	*lb.*	.14	@	
Red excelsior	*lb.*	.12	@	
Toluidine toner	*lb.*	4.00	@	
Iron oxide, reduced grades	*lb.*	.14	@	
pure bright	*lb.*	.16	@	

Spanish	lb.	$0.04 @ $0.06
Venetian	lb.	.02½ @ .05
Oil soluble aniline, red	lb.	2.00 @
orange	lb.	1.75 @
Oximony	lb.	.18 @
Vermilion, American	lb.	.25 @ .30
artificial	lb.	.35 @
English quicksilver	lb.	1.55 @ 1.75

White:

Aluminum bronze, C. P.	lb.	.51 @
superior	lb.	.55 @
Lithopone, domestic	lb.	.07¾ @ .08½
Ponolith (carloads, factory)	lb.	*.07 @ .07¼
Rubber-makers' white	lb.	.11¼ @
Zinc oxide, Horsehead (less carload, factory):		
"XX red"	lb.	.10 @
"Special"	lb.	.10 @
French process, red seal	lb.	.11¾ @
green seal	lb.	.12¾ @
white seal	lb.	.13¾ @
(States)	lb.	*.08½ @
Azo, ZZZ, lead free (carload factory)	lb.	.09½ @ .10
ZZ, under 5% leaded (carload factory)	lb.	.09 @ .09½
Z, 8-10% leaded (carload factory)	lb.	.08¼ @ .08¾

Yellow:

Cadmium, sulphide, yellow, light, orange	lb.	2.00 @
red	lb.	1.85 @
Chrome, light and medium	lb.	.30 @
Ochre, domestic	lb.	.03 @ .07
imported	lb.	.05 @ .07½
Oil, soluble aniline	lb.	2.00 @
Zinc chromate	lb.	.40 @

COMPOUNDING INGREDIENTS.

Aluminum flake	ton	@
silicate	ton	25.00 @ 35.00
Ammonia carbonate, powdered	lb.	.17¾ @
Asbestine (carloads)	ton	25.00 @ 28.00
Asbestos (bags)	ton	*35.00 @
Avoilas compound	lb.	.16 @
Barium, carbonate, precipitated	ton	85.00 @
sulphide, precipitated	lb.	.07 @
dust	ton	95.00 @
Barytes, pure white	ton	32.50 @ 40.00
Barytes, off color	ton	22.50 @
uniform floated	ton	37.50 @ 40.00
Basofor	lb.	.05 @
Blanc fixe	lb.	.04½ @
Bone ash	lb.	.10 @
Carrara filler	ton	25.00 @
Chalk, precipitated, extra light	lb.	.05 @ .05½
heavy	lb.	.04 @ .04½
Blue Ridge	ton	20.00 @
China clay, Dixie	ton	20.00 @
domestic	ton	18.50 @ 20.00
imported	ton	18.00 @ 23.50
Shawnee	ton	20.00 @
Cotton linters, clean mill run, f. o. b. factory	lb.	.04½ @
Fossil flour (powdered)	ton	65.00 @ 70.00
(bolted)	ton	75.00 @ 80.00
Diatomite	lb.	.03 @
Glue, high grade	lb.	.35 @ .40
medium	lb.	.30 @ .35
low grade	lb.	.20 @ .25
Graphite, flake (400-pound bbl.)	lb.	.10 @ .30
amorphous	lb.	.04 @ .08
Ground glass FF. (bbls.)	lb.	.03 @
Infusorial earth (powdered)	ton	65.00 @ 70.00
(bolted)	ton	75.00 @ 80.00
Liquid rubber	lb.	.18 @
Mica, powdered	lb.	.08½ @ .09
Fumice stone, powdered (bbl.)	lb.	.05 @
Rotten stone, powdered	lb.	.02½ @ .04½
Rubber paste	lb.	.15 @
Rub-R-Glu	lb.	*.20 @ .25
Silex (silica)	ton	22.00 @ 40.00
Starch, powdered corn (carload, bbls.)	cwt.	5.34 @
(carload, bags)	cwt.	5.12 @
Talc, powdered soapstone	ton	18.00 @ 25.00
Tripoli earth, air-floated	ton	50.00 @ 52.00
Tyre-lith	ton	85.00 @
Whiting, Alba (carloads)	cwt.	.80 @ .90
Columbia	cwt.	.80 @
commercial	cwt.	1.50 @
English cliffstone	cwt.	2.00 @
gilders	cwt.	1.60 @
Paris, white, American	cwt.	1.75 @
Quaker	ton	16.00 @
Super pure	ton	30.00 @
Wood pulp, imported	lb.	.03¾ @
Wood flour, American	lb.	.02 @

MINERAL RUBBER.

Elateron	ton	55.00 @ 60.00
Gilsonite	ton	60.00 @ 65.00
Genasco (carloads, factory)	ton	55.00 @
(less carloads, factory)	ton	57.00 @
Hard hydrocarbon	ton	[illegible] @
K-X	ton	30.00 @
K. M. R.	ton	50.00 @ 80.00
M. R. X.	ton	100.00 @
Pioneer, carload, factory	ton	50.00 @
less carload, factory	ton	57.00 @
Raven M. R.	ton	50.00 @ 70.00
Refined Elaterite	ton	175.00 @
Richmond	ton	75.00 @
No. 64	ton	44.00 @
318/320 M. P. hydrocarbon	ton	50.00 @ 80.00
Robertson, M. R. Special (carloads, factory)	ton	70.00 @
M. R. (carloads, factory)	ton	55.00 @ 57.50
Walpole rubber flux (factory)	lb.	.05 @

OILS.

Castor, No. 1, U. S. P.	lb.	.21 @
No. 3, U. S. P.	lb.	.20 @
Corn, refined Argo	cwt.	23.56 @
Cotton	lb.	.20 @
Glycerine (98 per cent)	lb.	.27 @ .29
Glycerole	lb.	.55 @
Linseed, raw (carloads)	gal.	1.77 @
Linseed compound	gal.	.85 @
Palm (Niger)	lb.	.17 @ .18
Peanut	lb.	.27 @
Petrolatum	lb.	.06 @ .07
Petroleum grease	lb.	.04¾ @
Pine, steam distilled	gal.	1.65 @
Rapeseed, refined	lb.	.22 @
blown	lb.	.22 @
Rosin	gal.	.68 @
Soya bean	lb.	.19 @
Tar	gal.	.36 @

RESINS AND PITCHES.

Balsam, fir	gal.	2.00 @
Cantella gum	lb.	.55 @
Tar, retort	bbl.	15.25 @
kiln	bbl.	14.75 @
Pitch, Burgundy	lb.	.09 @
coal tar	lb.	.01 @
pine tar	lb.	.04 @
ponto	lb.	.14 @
Rosin	bbl.	16.95 @ 21.75
granulated	lb.	None
fused		None
Rosin, K	bbl.	21.00 @
Shellac, fine orange	lb.	1.65 @ 1.75

SOLVENTS.

Acetone (98.99 per cent drums)	lb.	.16 @
methyl (drums)	gal.	1.15 @
Benzol, water white	gal.	.25 @ .29
Beta-naphthol, resublimed	lb.	1.05 @ 1.10
ordinary grade	lb.	.53 @
Carbon bisulphide (drums)	lb.	.05¾ @ .07
tetrachloride (drums)	lb.	.10½ @ .13
Naphtha, motor gasoline (steel bbls)	gal.	.26½ @
72 @ 76 degrees (steel bbls.)	gal.	.36½ @
68 @ 70 degrees (steel bbls.)	gal.	.33½ @
V. M. & P. (steel bbls.)	gal.	.25½ @
Toluol, pure	gal.	.28 @ .32
Turpentine, spirits	gal.	1.92 @
wood	gal.	1.60 @
Osmaco reducer	gal.	.35 @
Xylol, pure	gal.	.35 @ .45
commercial	gal.	.35 @ .40

SUBSTITUTES.

Black	lb.	.10 @ .22
White	lb.	.11 @ .24
Brown	lb.	.15 @ .23
Brown factice	lb.	.12 @ .23
White factice	lb.	.13 @ .25
Paragol, soft and medium (carloads)	cwt.	18.58 @
hard	cwt.	18.08 @

VULCANIZING INGREDIENTS.

Lead, black hyposulphite (Black Hypo)	lb.	.39 @
Orange mineral, domestic	lb.	.14¾ @
Sulphur chloride (drums)	lb.	.07 @
Sulphur, flour, Brooklyn brand (carloads)	cwt.	3.40 @
Bergenport brand (carloads)	cwt.	3.40 @
superfine (carloads, factory)	cwt.	[illegible] @

(See also Colors—Antimony.)

WAXES.

Wax, beeswax, white	lb.	.66 @ .68
ceresin, white	lb.	.15 @ .16
carnauba	lb.	.46 @ .90
ozokerite, black	lb.	.60 @ .65
green	lb.	.75 @ .80
Montan	lb.	.20 @ .32
substitute	lb.	None
paraffine, refined 118/120 m. p. (cases)	lb.	.10 @
123/125 m. p. (cases)	lb.	.10½ @
128/130 m. p. (cases)	lb.	.11¼ @

*Nominal.

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC GUTTA-PERCHA

Vol. 61 MARCH 1, 1920. No. 6

TABLE OF CONTENTS.

Editorials: Pages
Goodyear and the Hall of Fame.................. 337
As to Pneumatics for Trucks....................337-338
Rubber Rainbows 338
Rubber Leaders on Industrial Relations........... 338
Minor Editorial 338

Charles Goodyear Nominated for the Hall of Fame Portrait 339-340

Seeing the Short Cuts 340-341

The Rapid Rise in the Cost of Equipment. An Important Factor in Rubber Production Cost Accounting. By L. W. Alwyn-Schmidt. Illustrated 342-344

Production, Not Selling, Is the Problem. By Colonel Samuel P. Colt 344

Standard American Export Practice.................345-347

Rubber in the Safety Council 347

Machinery Equipment for Tire Repairing and Rebuilding. ....Illustrated 348-350

Government Standard Specifications for Rubber Tires, Tire Repairs and Accessories.....................351-353

Foreign Import Duties on Boots and Shoes.......... 354

Foreign Import Duties on Rubber Tires.............355-356

A Rapid Method for the Determination of Sulphur in Rubber Mixtures.
By G. D. Kratz, A. H. Flower and Cole Coolidge 356-358

Plantation Rubber, a Forecast....................... 358

Chemistry:
What the Rubber Chemists Are Doing...........359-361
Identifying Artificial Rubbers. Determination of the Softening Point of Asphaltum and Other Plastic Substances.
Chemical Patents 361
Laboratory Apparatus ....Illustrated 361

Machines and Appliances ....Illustrated 362-364
Machine for Calculating Fabric Waste in Footwear Manufacture. Safety Motor Starters. Hydraulic Accumulator System. Machine for Making Bias Fabrics. A Flexible Coupling for Mill Lines. A Safety Interlocking Nut and Bolt.

Machinery Patents ....Illustrated 364
Cord Covering and Cord Fabric Machine. Hose Making Machine. Other Machinery Patents.

Process Patents 364

New Goods and Specialties ....Illustrated 365-366
A Glove That Grips. To Protect Shoe Toes. A Rugged Cord Tire. Two New Golf Balls. A Red Rubber Fan Belt. A New Dust Cap for Tire Valves. An Endless Air Bag. A Rubber Glove with Knuckles. A Reinforced Blow-out Patch. Pneumatic Life Saving Garment. Rubber Splice Insulator. An Automatic Safety Tire Valve. Valves and Squawker Ends for Toy Balloons. "Parco" Inner Tire.

The Rubber Association of America—Activities of...367-368

Obituary Record 368-369
Alfred Whitehead (portrait). Ohio Columbus Barber. William Quigley Cramp (portrait).

Inquiries and Trade Opportunities..................369-370
New Trade Publications 370
Condamine, the Popularist of India Rubber. Portrait. 371
Editor's Book Table.............................. 370
"Ceylon Rubber Planter's Manual." "The Financier Rubber Share Hand Book." "Hendrick's Commercial Register of the United States for Buyers and Sellers."

New Incorporations 371-372

Interesting Letters from Our Readers................ 372

American Rubber Trade—News Notes and Personals 373-383
Dividends 373
Financial Notes 373-374
Personal Mention 375
Eastern and Southern Notes..........Illustrated 375-376
Massachusetts ....By Our Correspondent 377
Rhode Island ....By Our Correspondent 378
New Jersey ....By Our Correspondent 378-379
Ohio ....By Our Correspondent. Illustrated 380-382
Mid-Western Notes. .....By Our Correspondent 382-383
William J. McMahan..........Portrait and Sketch 382
Pacific Coast ....By Our Correspondent 383
Canadian Notes 383

Foreign Rubber News:
The Rubber Trade in Japan.
By Our Correspondent. Illustrated 384-385
European Notes 385

Patents Relating to Rubber 386-387
United States. Canada. United Kingdom. France. Germany.

Trade Marks 387
United States. Canada. United Kingdom.

Markets:
Crude Rubber, London View of the 1919 Market. Chart 389-390
Monthly Review 392
Highest and Lowest Spot Rubber Prices 1913-1919 391
Comparative High and Low Spot Rubber Prices for February 392
Amsterdam Rubber Market 393
Antwerp Rubber Market 393
Batavia Rubber Market 393
Singapore Rubber Auctions 393
Reclaimed Rubber 392
Rubber Scrap 398
Cotton and Other Fabrics.........................398-399
Chemicals and Ingredients 400-401

Statistics:
Antwerp Rubber Arrivals 395
Brazil, Manáos Rubber Exports, 1919........... 390
Canada, Statistics for November, 1919........... 397
Ceylon Rubber Imports and Exports, 1919........ 391
Cotton Statistics 400
Federated Malay States Rubber Exports, 1919... 390
Java Rubber Exports for Ten Months Ended October, 1919 391
Penang Rubber Exports for 1919................ 390
Straits Settlements Rubber Exports, 1919........ 390
United Kingdom Statistics for 1919............. 398
United States:
Crude Rubber Arrivals at New York as Stated by Ships' Manifests..........................393-395
Imports for 1920 (By Months)............... 393
of Plantation Rubber by Ports—1919...... 391
Exports During December, 1919 (By Countries) 396-397
Statistics for 1919 39

THE GUTTA PERCHA & RUBBER MFG. CO.

ESTABLISHED 1855

MANUFACTURERS OF

RUBBER BELTING, PACKING, HOSE, MATS, MATTING

AND

MECHANICAL RUBBER GOODS OF EVERY KIND

Warerooms: Nos. 126-128 Duane St., NEW YORK

BRANCH STORES:

301 West Randolph St. CHICAGO — 71 Pearl Street BOSTON — 241 Chestnut Street PHILADELPHIA — 34 Fremont Street SAN FRANCISCO

HENRY SPADONE, Pres. — WALTER W. SPADONE, Vice-Pres. — ALFRED A. SPADONE, Sec'y — GEO. B. DICKERSON, Treas.

HOOD RUBBER CO.

MANUFACTURERS OF

Rubber Boots and Shoes

Rubber Sole Canvas Shoes

Tennis Shoes

Pneumatic Tires and Tubes

Solid Tires for Trucks

WATERTOWN, MASS.

63 YEARS

1856 TYRIAN TRADE MARK ESTABLISHED 1856 1919

Tyer Rubber Co., Inc.

Manufacturers of

DRUGGISTS' RUBBER GOODS

"TYRIAN"

Automobile Tires and Inner Tubes

Stationers' Rubber Bands

RUBBER MOLD WORK A SPECIALTY

ANDOVER, MASS., U. S. A.

H. A. ASTLETT & CO.

113-117 Pearl Street, New York

CRUDE

WASHED & REFINED

RUBBER

HEAVY CALCINED MAGNESIA

ADVANTAGEOUS PRICES

STRESEN-REUTER & HANCOCK, Inc.

FOR SALE AT THIS OFFICE

80 Washington Street, New York, N. Y.

INDIA RUBBER WORLD

CAOUTCHOUC — HEVEA BRASILIENSIS — FOUNDED 1889 — DICHOPSIS GUTTA — GUTTA-PERCHA

. U. S. Pat. Off. Reg. United Kingdom

Edited by HENRY C. PEARSON

Vol. LXII. No. 1. APRIL 1, 1920 35 CENTS $3.00 Per Year. $3.50 Abroad.

CANADIAN CONSOLIDATED RUBBER CO., LIMITED

Executive Offices: MONTREAL, CANADA

CANADIAN CONSOLIDATED RUBBER CO. LIMITED — DOMINION RUBBER SYSTEM AND ASSOCIATED COMPANIES

CHARLES B. SEGER, President,
W. A. EDEN, Vice-President,
VICTOR E. MITCHELL, K. C., Vice-President,
R. E. JAMIESON, Director in Charge of Sales,
W. BINMORE, Secretary-Treasurer.

THE LARGEST MANUFACTURERS OF RUBBER GOODS IN THE BRITISH EMPIRE

12 Large Manufacturing Plants — 28 "Service" Branches throughout Canada

The Whitehead Brothers Rubber Co.

MANUFACTURERS OF

High Grade Mechanical Rubber Goods
"Long Life" Steam Hose
Suction Hose for all purposes
Water Hose, Belting, Packings
Springs, Valves, etc.

TRENTON, N. J.

Japanned, Bronzed, Solid Brass, Nickel, Brass or Copper Plated

BUCKLES

for

Footwear and Clothing.

THE SHOE HARDWARE CO., Waterbury, Conn.

Bound Yearly Volumes of

The India Rubber World

For Sale at This Office
25 WEST 45th STREET

"BOSS" COUPLINGS

For Steam, Air and High Pressure Hose
BEST ROCK DRILL COUPLING MADE

Spud Standard Iron Pipe Thread

Clamp has Improved Features

Every Rubber Manufacturer and Jobber should know this coupling and have our prices.

DIXON VALVE & COUPLING CO.
PHILADELPHIA
New York — Baltimore

DAVID FEINBURG CO.

NEW, OLD, CURED AND UNCURED

RUBBER SCRAP

11 BROADWAY, CHELSEA, MASS.

Cable Address
"Feinco" Chelsea
Liebers and A B C, 4 & 5 edition

INDIA RUBBER WORLD
CAOUTCHOUC FOUNDED 1889 GUTTA-PERCHA

Reg. United States Pat. Off. Reg. United Kingdom.

Published on the 1st of each month by

THE INDIA RUBBER PUBLISHING CO.
No. 25 West 45th Street, New York.
Telephone—Bryant 2576.
CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, F.R.G.S., Editor

Vol. 62. APRIL 1, 1920 No. 1

SUBSCRIPTION: $3.00 per year, $1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, $3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft. Post Office or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

DISCONTINUANCES: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

TABLE OF CONTENTS ON LAST PAGE OF READING.

PENNY WISDOM.

THE AMERICAN RUBBER INDUSTRY, with its vastly increasing interests, may well view with grave concern the proposal in Congress to economize through a 28 per cent reduction in the appropriation for the upkeep of the Bureau of Foreign and Domestic Commerce and the Bureau of Standards. Very valuable has been the service of the former bureau in aiding in the development of this country's manufacturing industries and in extending their markets at home and abroad, not only by gathering, with the aid of trained experts, a great amount of helpful information, but also in actively directing through commercial attachés in other lands the speedy and profitable distribution of American products. So, too, have the functions of the other bureau been of great aid in establishing standards for scientific investigations, engineering, manufacturing, interstate and international trade, and educational institutions.

Reduced resources for those agencies would mean curtailment of the scope and volume of their work, impaired usefulness of the bureaus, and the consequent handicap that American manufacturers must suffer in trying to cope with powerful rivals overseas for a fair share of the world's post-war trade.

American business men know far better than politicians how quickly war-worn countries are being regenerated and how many obstacles this country must surmount if the United States is to hold its own in foreign commerce under conditions profoundly changed by the Great Conflict. They know only too well that if our industries are to flourish we must develop foreign trade as well as meet the needs of our home market. In other words, domestic stability and national growth are vitally dependent upon steady, increasing international commerce.

Congress cannot shirk its plain duty to fairly aid American enterprise; and it is incumbent not only upon rubber manufacturers, but upon those in all other lines to protest against such false economy and to demand of the Government not only for themselves but for the American people the aid and consideration that other governments only too gladly offer as a reward for their industry and to enhance their prosperity.

CLEAN RUBBER AT THE SOURCE.

CLEANING RUBBER at the source of production was a project that once attracted considerable attention and was also successfully and profitably accomplished, although in a small way. When only wild rubber was available some process was needed, for washed and dried rubber in the manufactory showed an average loss of 40 per cent for African, 30 per cent for Centrals, and 20 per cent for Parás. The "loss" was chiefly dirt and water and presumably could just as well be removed before shipment as after.

It, therefore, was natural that small cleansing plants should be erected on the African coast; in Central and South America. They were never very successful nor generally patronized. The main reason was, that there was always the feeling that rubber should be gathered in a cleanly manner and not need further cleansing, and furthermore, a multiplicity of grades gave greater profit to those alert in substitution.

With the advent of plantation rubber the problem solved itself. Almost at once clean dry rubber ready for "breaking down" was on the market in great quantities. Scrap and earth rubber were cleaned at the plantation factories.

To show what an advance this is, one has only to imagine plantation rubber as showing 20 per cent shrinkage. If this were the case American rubber manufacturers would pay freight upon 30,000 tons or more of water and dirt plus the costs of extraction.

Other suggestions for doing some of the initial work at the source are massing and compounding. The former is not viewed with favor as the plantation identity is lost and massed rubber is likely to perish in transit. As for compounding that has been done experimentally, both by adding sulphur and fillers to latex and in the usual manner. In neither case was it found practical.

So far, therefore, cleansing at the source is the only rubber process that has been transplanted from the factory to the forest.

A CENSUS FOR SAFETY.

This being Census Year, it is fitting that the rubber trade, thinking along with the Government, should have a census of its own. Thus, the plan of the Rubber Section of the National Safety Council, to secure a census of accidents in the rubber industry is not only timely but of the greatest importance. The facts thus gathered, classified and analyzed by a committee made up of practical men from the big rubber plants, will result in prompt remedies, in new safety appliances, and in a marked lessening of accidents.

Much has been done in the past to make rubber factories safe to the worker. But regrettable accidents still occur. It is so in every great industry. In our United States 80,000 fatal accidents occur in factory and home annually. Of these the rubber trade has its share. And it is to this safety census that we look with confidence for a good measure of relief.

IT KILLED THE PAPER SOLE.

That is what the rubber leather sole did for mankind. When leather was the only substance that shod foot bottoms, anything that looked like it was used. Sole leather veneers backed up with rags, strawboard—any cheap filler that could be obtained was used, and the novice bought and repented. But with the advent of the rubber leather sole, the producers of leather and near-leather woke up. Their business was jeopardized. They had forfeited the confidence of the great shoe-wearing public, and the paper sole disappeared. Not only that, but the very best that the leather man could produce was put into soles. Furthermore, thousands of dollars were put into frantic advertising of certain best makes. Thus rubber did a great service, and best of all the rubber sole won for itself a place, from which no policy, no advertising appropriation can evict it.

KANSAS STRIKES AT GENERAL STRIKES.

The State Court of Industrial Relations established in Kansas is urged upon other states by Governor Allen, who says:

> "Any minority which has secured control of a product upon which human life depends, and which undertakes, for the purpose of affecting wages or profits, to withhold that product from the public until the public shall freeze or starve, has, in effect, superseded government and has arrogated to itself the control of the destinies of human life which government alone may have the power to safeguard."

This is plain talk and foreshadows the day when no clique, either of labor or capital, will have it in its power to paralyze industry.

In this connection, the report of the Second Industrial Conference which is now in the hands of President Wilson is of great interest. This takes a firm stand against "collective bargaining," holding that individual plants should settle their own labor problems.

Of further interest and of much significance is the action of certain large cities that have declared themselves as wholly "open shop" communities.

All of the above point to a cessation of labor struggles and fewer strikes.

TIRE PRODUCTION FOR 1920.

Prophets, of course, are as fallible as those who do not venture opinions. Furthermore, the major part of prophesies fail. There are two lines of forecast however, that have gone far beyond the wildest hazards; the production of crude rubber and the annual increase in tire production. As to the later, estimates vary rather widely. Based upon the figures of a well-known automobile man, one of the directors of the Motor and Accessory Manufacturers' Association, 1920 will see 51,500,000 tires produced. A statistician of the "Boston News Bureau," basing his figures upon facts furnished by the Firestone Tire & Rubber Co., predicts 72,000,000 tires. This, however, may not be possible because of scarcity of fabrics. Experts state that the present spindle capacity is 150,000,000 pounds of fabric, enough for 40,000,000 tires, which would suggest more spindles or use of some other fiber in tire building.

Ludwig C. A. K. Martens, Russian Soviet represensative, recently published a long list of American firms who were "anxious to do business" through him with Russia. Among the names were certain large rubber companies. A protest was promptly filed with the Senate Foreign Relations Committee by whom an examination is being conducted and Martens conceded that "they (the companies in question) have been solicited to sell goods and have not sought orders."

It may be of interest in this connection to state that a very cleverly written article from Soviet headquarters was sent to The India Rubber World months ago, describing Russian markets and the millions to be spent in America. It was not published.

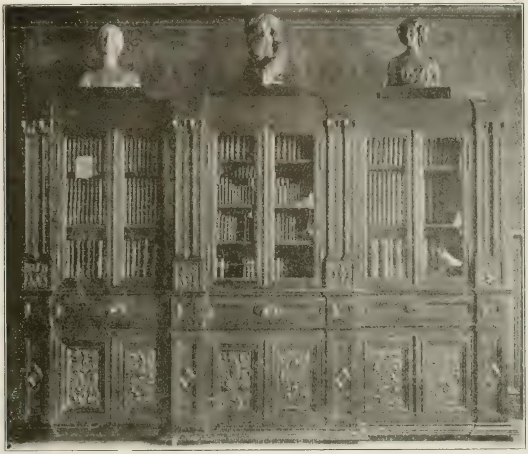
Former Premier Clemenceau of France announces that he is tired of politics and is going to the deserts of Africa to "seek a fortune in rubber." It seems that one of his compatriots has discovered a new process of refining the gum of the *Eucalyptus,* and that is to be exploited. Frankly, we wish he wouldn't. He is too good and too great to be wasted upon a hopeless quest. If only he would take up a big tract of land and plant cotton, that would help the world, the rubber trade, and himself. But to-day wild rubber from any minor producer does not spell success.

Is Hard Rubber Wood a Dream?

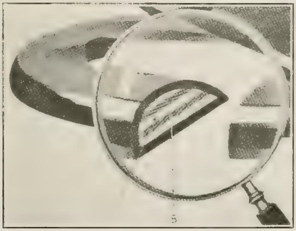
Lloyd W. Parsons, a regular contributor to "The Saturday Evening Post," who furnishes much interesting and informing matter for that great weekly, thus speaks of rubber:

"Henry C. Pearson, of The India Rubber World, sees the day when you can take the milk of the rubber tree, convert it into an elastic resin, then bake this resin with sulphur and turn the product into rosewood, walnut, mahogany and ebony of the finest sort.' He says: 'Any rare wood can thus be simulated. It will not warp or check, and it will not absorb moisture. Its sawdust and chips can be molded again into the first shape. Even the boards once out of use can be ground up and used again and again.'

"Whether such dreams materialize or not, rubber is sure to become one of the mightiest essentials in the life of civilized man."



An Artistic Rubber Wood Cabinet.

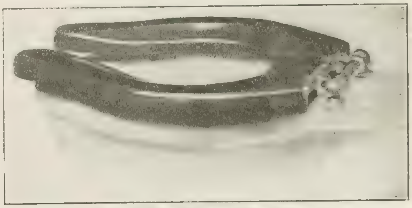


Rubber Wood Closet Seat—Mahogany.
A and B Interior Lamination.

Mr. Parsons characterizes hard rubber wood as a dream, and does it most courteously. He classes it with that type of dream known in the dictionary as "an idle fancy." If, however, it should transpire that certain American factories were marketing products made of hard rubber wood, taking the place of tropical woods, the statement of the Editor at once is transferred from fancy to fact. Such is the case.

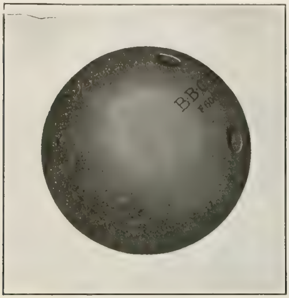
BLACK OAK RUBBER WOOD.

Before starting to discuss present products it is well to recall that a few years ago a French artist built some very beautiful cabinets and bookcases not from wood but from hard rubber veneer backed with papier-maché. The effects secured were equal in every way to the best rosewood, mahogany and black oak. They were free from all of the faults that wood possesses. Heat or cold, moisture or dryness were absolutely without effect upon the product. No coating or varnish was used in the surface finish, as none was needed. The cabinet shown in the



Rubber Wood Closet Seat—Ebony.

illustration was pronounced by wood connoisseurs to be a wonderful effect in black oak. A worn out cabinet of this sort could be broken up, the cellulose backing dissolved by the familiar process of acid rubber reclaiming and the hard rubber ground

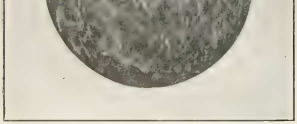


Regulation Rubber Wood Bowling Ball. Plain Black.

and used in the production of new goods. At last reports, panels from this cabinet were reposing in a bonded warehouse in New York City.

HARD RUBBER LIGNUM-VITAE.

There is in the West Indies a tree, the *Guaiacum*, from the heart of which comes a dark-colored, heavy, cross-grained wood known as lignum-vitae. The wood is scarce and costly as it is in great demand for rollers, pestles, pulley blocks, and particularly for bowling balls. No other wood is comparable with it for such use. No other substance or combination of substances anywhere near equalled it in weight, solidity, polish and effectiveness until a hard rubber substitute was tried. Then it was not only equalled but outdone. To-day a bowling ball made of



Regulation Rubber Wood Bowling Ball, Mottled Like Lignum-Vitae.

hard rubber compound designed to imitate lignum-vitae reigns supreme. For weight, color, and polish it is everything that could be desired. And as for grain, Nature is beaten to a finish. Hard rubber lignum-vitae outwears the West Indian product. It contains no knots nor imperfections. And after years of service the worn out ball can be ground up into hard rubber dust and worked into sheet, rod or a thousand other useful hard rubber products.

HARD RUBBER EBONY AND MAHOGANY.

For interior finish hard rubber wood already has a firm foothold. The product is not called rubber lumber or rubber wood, however, but Whalebonite. Responding to a call for rubber from the medical fraternity, a closet seat made of hard rubber wood, imitating in color either ebony or mahogany, has been created. From the first it was a great success. It is so far superior to the best wooden seat that scores of hospitals, clubs, hotels and office buildings have adopted it. Unlike wood, it has no joints, will not split, crack or warp, is light in weight, and is absolutely unaffected by moisture, or by acid or acid fumes.

Not fancies, these, but facts—facts that forecast a great future for rubber wood.

THE POSITION OF PLANTATION RUBBER IN 1919.

An interesting survey of the present condition of the plantation rubber market is made by E. L. Killick, the rubber expert of the London "Financier" in that periodical's "Rubber Share Handbook" for 1919. His judgment is as follows:

"A scrutiny of the figures relating to the production and consumption of rubber indicates that the world's stocks of all kinds at the present time are not less than 100,000 tons, and probably more. As far as can be ascertained at the moment, the total production in 1919 was about 350,000 tons, of which some 330,000 tons appear to have gone into consumption. The year consequently begins with but a comparatively small addition to the surplus on hand twelve months before. In 1920 an addition of some 50,000 tons to the world's output is expected, so that the total quantity of rubber of all kinds available this year, including stocks brought forward, seems likely to be something over 500,000 tons."

These figures are not so formidable as they seem to be at first sight, he goes on to say, because of the increased demand due to the development of motor traction. They leave a margin of three or four months' supply, as compared with the single month of a few years ago, but this is largely nullified by the congestion at the docks and the delays in distributing cargoes.

While there is no shortage in sight there is no fear of a glut of rubber; the production will hardly increase at the rate that the consumption will. An enormous development has taken place in the use of solid tires for commercial motors and the railroad strikes have shown the advantages of both these and the passenger motor cars. It is conceivable that there may be a shortage of rubber in a few years, with higher prices in consequence and a larger use of inferior grades and reclaimed material.

Mr. Killick explains that investment in rubber plantation shares is attractive not only on account of the huge returns obtained but also because the investment is steadily appreciating as the value of the plantation and its output increase yearly with the growth of the trees planted. His estimate of the finances of an acre of land in the Far East is very interesting.

"We may take it that an acre of jungle can be cleared, planted and brought to bearing at an approximate cost of £50. In Malaya, Sumatra and Borneo the tree should be of tappable girth at the end of the fifth year, and by the end of the seventh year the annual crop of rubber may be as much as 400 pounds per acre, given good average soil, suitable climatic conditions and capable management."

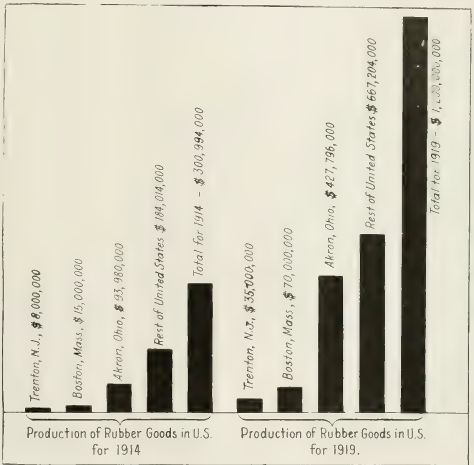
The question of producing costs is a little uncertain now, one disconcerting factor being the rise in the rupee and the trouble with exchange. In the past rubber has been marketed at an average cost of 10*d*. a pound, but to-day it costs at least 1*s*. and prices are advancing so that it is safer to take 1*s* 6*d*. as the cost of a pound of rubber ready to ship. The mean price obtained for it in the last five years has been 2*s*. 6*d*. a pound, and when Mr. Killick wrote, it was 2*s*. 10*d*. It is safe to call it 2*s*. 6*d*.; the profit on a pound would therefore be 1*s*. and on 400 pounds, an acre's crop, £20. That is the equivalent of 40 per cent on the capital investment of £50 to bring the acre into bearing.

The Effect of Location on Prosperity of American Rubber Industry.

By L. W. Alwyn-Schmidt, Consulting Economist.

The value of all the rubber goods manufactured in the City of Akron, Ohio, during the year 1914 amounted to $93,980,000, representing 41.4 per cent of the total output of rubber goods during that year valued at $300,994,000. No other city of the United States, or in the whole world, can show such an enormous production of rubber goods. The nearest approach to it in the United States is the City of Trenton, New Jersey, that produced rubber goods valued at $8,000,000 in 1914. It is, therefore, no wonder that Akron gives Ohio a superior lead in the manufacture of rubber products and makes it the leader among the states of the Union. During the year in question the value of rubber goods manufactured in that state amounted to $109,659,000. New Jersey with Trenton came second with a total production value of $25,458,000. Massachusetts, having Boston as its main center of rubber production, followed with a production valued at $23,000,000, Pennsylvania with $12,000,000, while Connecticut and New York each reported $10,000,000 approximately.

Both Akron and Trenton have kept their superiority as producers of rubber goods practically since rubber manufacturing started in the United States, but their influence upon American rubber production was considerably less during the preceding census when only 38.4 per cent of all the American rubber goods were manufactured in Akron, while Trenton did slightly better with 3.9 per cent to its share. As to rubber boots, Boston takes the lead, holding practically the whole of the production of Massachusetts, which also leads as a state in the production of rubber footwear, with a total production valued at $13,000,000 before the war. New Jersey, as in the past, still claims to be the leader as a producer of rubber belting, the industry giving to the city of Trenton its great importance as a rubber manufacturing center.



The Comparative Growth of the United States Rubber Industry in Localized Districts.

Such concentration of one industry might be easily understood in the case of industries which are bound to their location by reason of their markets or the supply of raw materials. It appears, therefore, rather surprising that the rubber industry, which is not tethered by any of these considerations, has selected these localities for its home in the United States. Considering the enormous economic importance of the United States rubber industry one can say with some degree of correctness that the condition existing here is not repeated in any other country. Nowhere in the world is the rubber industry as concentrated as to include practically half of its total production inside the limits of one city which does not even claim to be of exceptional size. Neither is there anything in the present situation that could have forced the United States rubber industry to develop the plan of its original growth upon so narrow a basis as has been the case.

RUBBER INDUSTRY ECONOMICALLY INDEPENDENT.

Speaking from the viewpoint of national economy the rubber industry is an independent industrial unit. It is one of the master industries of the country and not supplementary to others. There is, therefore, no reason to locate in districts where it might be situated in easy proximity to other industries requiring its products. Such considerations may have influenced the location of the drop-forging industry, for instance, or the shoe findings industry, both industries that look for their market to related industries for which they prepare the raw materials. But the rubber industry has an independent market. While it is supplementary to certain industries which employ its products for the purpose of completing their own, there is no need for the rubber industry to rely upon the custom of these industries. It has its own markets and marketable products that are increasing in number and range of consumption from year to year. It is, therefore, tied less to location than many other industries, and its selection of locality is not determined by this one factor which narrows down considerably the choice of a home of many other industrial enterprises.

The explanation of the present situation in the geographical location of the United States rubber industry is, undoubtedly, historical development. The industry, having originally found a home in certain cities of the United States, continued to grow within these limits as the result of a natural division and subdivision of formerly united forces and, having once provided the ground for development, remained there by the simple force of habit. The outcome is analogous to that experienced in many other industries similarly placed, but just as conservative in the selection of their locations.

Having once acquired the habit, the industry has been slow to mend its ways. There was, no doubt, a certain advantage in the beginning in locating as much as possible in one city or district. The labor of other factories could be drawn upon. The men who formed the new enterprises were themselves at home in the district and had grown up in it. Finally, when the industrial development of the rubber industry started in earnest there was the main consideration of participating in the pros-

perity of the existing enterprises by starting operation from the same basis that had proved successful in their instance. But it is questionable whether the limits of this earlier development of the industry have not been reached, whether in the meanwhile in fact it has not outgrown the surroundings of its childhood.

This is a point which deserves the most serious consideration of the men in charge of the future of the rubber industry.

ECONOMIC CAPACITY OF ANY ONE CITY IS LIMITED.

The economic possibilities of any given neighborhood and its capacity for sustaining an industry are by no means inexhaustible. If this fact had not been already known to economists our most recent war history would have brought new proof. Under the pressure of the unprecedented war demand many industries were forced to expand, and finding it convenient for their purpose carried through the process of expansion upon the apparently fertile soil of their own location. New factories were erected in the immediate neighborhood of the mother enterprises and labor was attracted to the localities by the artificial means of offering high wages and similar inducements. The so-called war prosperity of the nation has not diminished since this happened. In fact, always excepting those industries that were connected immediately with the war, there has been a continuous growth in the economic activities of the country. Nevertheless, there is evidence that many of the works erected under the spur of the war were not destined to prosper under normal conditions. They find it difficult to hold their full complement of labor, they complain about the lack of fuel and power, and the distribution of their products is not proceeding as evenly as might be desired.

The cause is obvious. The existence of these new enterprises, planted upon the already heavily charged soil of one district, is menaced by the increasing economic exhaustion of that soil. A railway line can transport only a certain quantity of goods from and to one location. Charge it with a larger load and it must break down under its own real or imaginary prosperity. A community can house only a given number of inhabitants, and its facilities to provide for more are the limit of its progress toward increased population. It must take years to change these fundamental factors affecting the economic energies of a district and the industrial progress of the nation cannot wait until the process has been completed. Hence the failure of the industrial plants that come in contact with conditions as those described.

To apply this rule to the rubber industry there is much in the present location of that industry that calls for caution. The rubber industry in certain of its branches is a lavish employer of labor. It needs great quantities of water in others, and spacious factories are essential to the successful conduct of its affairs. This is not written to discourage the location of rubber factories in certain parts of this country, but to point out the danger of overloading the facilities of certain districts to the detriment of the industry as a whole.

EXCESSIVE CENTRALIZATION OF INDUSTRIES CAUSES INCREASE OF OPERATION EXPENSE.

It is only too obvious that industries working under artificially inflated conditions affecting their most essential manufacturing operations must work more expensively than others. Let three water-mills compete for the water power of one stream, and the system for carrying the water to the mill wheels will be more expensive to each mill than if only one mill operated on the same stream. The cost of mill operations will increase by the simple fact that the upkeep of the installations is more expensive. The same applies to a number of rubber factories competing for water, labor and the shipment of raw materials and manufactures inside the limits of one district or one city. Increased demand for these facilities will tend to increase their cost and while such a tendency may not show on the surface it is bound to influence each factory in one manner or another.

The need of having a large labor surplus, so essential to the operation of the rubber industry, causes a rather serious situation. To house this surplus, to make it comfortable and content with working conditions, is more difficult in a neighborhood dangerously overcharged than where living conditions are easy, where housing is plenty, and where labor may stay on comfortably even if temporarily unemployed.

If conditions are different, if they are in fact as witnessed just now in several of our great rubber manufacturing centers, labor will not stay. It will keep floating from city to city in search of better conditions, and it will certainly leave those locations where it finds it most difficult to remain. The result in each instance is an ever-recurring shortage of labor which makes work easy for the professional agitator. It degrades labor to the standard of a commodity shipped from city to city and prevents the growth of a healthy labor market based upon a labor force that owns its own home and commands a banking account that may be drawn upon during the short periods of unemployment which will happen even in the best organized industry. Incidentally it will give to the industry a labor force that stays on the job and does not leave for reasons entirely unconnected with conditions in the factory.

It seems from this that the present policy of centralization followed by the rubber industry is faulty from practically all reasons that apply to the selection of industrial location. It is not justified by the supply of raw materials and the markets of distribution. It has no support from the existence of special facilities for the operation of its enterprises because these conditions are not exceptional and are found practically in every city of importance in the United States. It is not advisable out of the special national consideration that may necessitate the location of certain valuable industries in regions where their presence is needed as a matter of economic policy.

While centralization is not wrong in itself and has its uses, a time may come where it can be dispensed with, where in fact a change in policy is advisable in the interest of the future growth of the industry. This time seems to have come for the American rubber industry.

The truth of this contention has been fully realized by many leading rubber manufacturers, and during the war attempts were made to place new rubber plants outside the more common range of location of that industry. No revolutionary steps have been undertaken, but the geographical location of the field of production has been broadened, with the result that many new cities have been entered by the rubber industry. The statistical records that are available for the study of such a development are still incomplete, and the following statements, therefore, are based upon general impression rather than upon statistical facts. The student of the more recent development in the United States rubber industry, however, will consent that this development while it has carried the industry over its former geographical limits, nevertheless has followed the lines of a distinct regional evolution. It has left the municipal centers and spread over states.

EFFECT OF RELOCATION.

The attempted relocation of the rubber industry has principally affected all the states that were originally important as rubber manufacturing centers, but it seems to have affected them not always in the same manner. In Ohio, for instance, the rubber industry has seen many additions. A close investigation of the situation, however, shows that the growth in the importance of that state as a rubber goods producer is still the result of increasing centralization, instead of the more desired decentralization of location. Akron still holds the overwhelming producing power of that state, and what new rubber works have been formed are located mostly in this city or in its immediate neighborhood. The gain of the rubber industry in that region, therefore, may not be an entire blessing, although it only falls in with the general tendency of the pre-war growth of the industry.

CENTRALIZATION IN EASTERN STATES.

Of more interest, however, is the industrial development of the industry in such states as New Jersey, New York, Massachusetts, Pennsylvania and Connecticut. The strength of the rubber industry of the first two states named is now concentrated upon an ever-widening area around the cities of Trenton and New York, with New York and its economic dependencies gaining an increasing influence upon the industry. In watching the development of the rubber industry in that particular field it is necessary to view the whole industrial district comprising the city of New York proper, Jersey City and Long Island as an economic entity which it really represents. The great port of New York divided between the two states of New York and New Jersey binds the district and makes it practically indivisible for all industrial purposes. Labor floats easily over it and may be drawn from its outskirts without necessitating even the relocation of its homes. The supply of raw materials, the distributing facilities of the whole district, its resources of industrial energy are all the same. It will take many years before the economic possibilities of this vast district are exhausted and before the rubber industry will be forced to vacate.

But while the whole district of New York has proven of exceptional strength, its subdivisions are showing considerable differences as to their general suitability for the location of the enterprises of the rubber industry. High ground rents, expensive railroad transportation, and high trucking cost, have made the industrial development of many parts at the mouth of the Hudson river uncongenial for industrial development and permit their industrial use for only the industries that can settle in such localities owing to special character of their production. Industries producing staple goods and having to compete with factories working often under the most favorable competitive conditions can hope to prosper only if they can create the same favorable conditions in their own location. The rubber industry of New York, therefore, has selected locations outside the circle of the most progressive industrial development of the Metropolitan district and has endeavored to duplicate the favorable characteristics of a location in a small city with the advantages of having at its disposal the facilities of the big city.

The same tendency is shown in Massachusetts, where the rubber industry in the beginning found its home in Boston proper, but is now spreading rapidly to the suburbs and is flowing over to the smaller cities of the state. Connecticut and Pennsylvania finally represent the newest phase of the evolution of the industry by introducing the decentralization of the industry over a district with a distinct mixed industrial character.

SCIENTIFIC GROUPING OF INDUSTRIES NEEDED.

It is obvious that the location of any industrial enterprise cannot be a matter of entire indifference to its owners, neither can it remain so for the nation as a whole. If decentralization, therefore, is recognized as a desirable aim it should be encouraged. But the selection of the new policy should not mean an entire cutting adrift from the past. The world progresses by evolution and not by revolution. We cannot hope to be benefited by throwing over the old without having first provided for the new. This is particularly the case in the instance under consideration. Nothing can be gained by placing factories outside the great centers of their industry for only the purpose of decentralizing industrial effort. What is required rather is a more scientific grouping of industries in order to make them supplementary in their economic wants and effort.

A new rubber factory for instance might be most advantageously placed in a district having already a few chemical plants of a general nature. The existing plants may easily furnish their floating surplus of labor to the rubber industry and in turn the new rubber works might attract labor to assist the chemical industry during the period of their high peak of operation. Generally speaking, districts with mixed industries are always preferable to such as specialize because they offer larger opportunities for the new plant in respect to labor, supply of raw materials, and markets. Port cities and cities with a plentiful water supply will always attract the rubber industry. But the case of Akron shows that a large industry can very well prosper without the advantages of a port of its own.

The problem of location, of course, must always be dealt with strictly individually. But it is just for that reason that it requires more thought and care than is generally given to it by the man in search for a new factory site. The thousands of factory buildings, standing empty in the United States before the war because their owners had failed to take the apparently so essential precaution to inquire into their special suitability for the intended purpose, speak a language of caution. There is waste in this form of handling the fortunes of our industry that could easily be avoided. After all, the rent for these buildings and the cost of all inlustrial failures has to be borne by the few who are destined to succeed. Every failure, every mistake in one of those fundamental conditions, makes success more difficult and production more expensive.

PRESIDENT MID-WEST RUBBER MANUFACTURERS' ASSOCIATION.

It is particularly fitting that John T. Christie should be president of the Mid-West Rubber Manufacturers' Association. He is a native son of the Middle West, and typifies the business enterprise of that section. He was born June 28, 1878, at Waterloo, Iowa, and has lived in the Hawkeye state ever since. Following his education in the public schools of Des Moines, he began his business career with the W. W. Wise Ice Co., of that city. He was later elected Deputy County Treasurer, and upon the expiration of his term became a partner in the Harter-Christie Insurance Co., eventually acquiring sole ownership of the agency, which is still being conducted under his supervision.

John T. Christie.

In 1915 Mr. Christie was one of the incorporators of the Hawkeye Tire Co., a Delaware corporation, and of the Hawkeye Tire Co., an Iowa corporation, both with an authorized capital of $500,000 to manufacture and deal in all kinds of automobile tires, inner tubes, etc., and was elected president, which office he has since held. Under his leadership the company has made continuous progress, and it is through the success of this organization that he has become prominent as one of the most promising of the younger rubber men. A year after its incorporation the firm name was changed to the Hawkeye Tire & Rubber Co., and later the capitalization of the company was increased to $3,500,000, and a new factory costing approximately $350,000 was erected.

A man of rare executive ability, quick perception, keen business judgment, and deeply interested in every movement pertaining to the rubber industry, Mr. Christie was among the leaders in organizing the Mid-West Rubber Manufacturers' Association, and was its first vice-president. In December, 1919, he was elected president.

New Uses for Old Tires and Tubes.

What to do with cast-off automobile tires is a burning question. Some 40,000,000 of them are now being discarded annually, and every year there will be more. Utilizing waste materials of every sort is one of the great problems of the times, and the item of old tires is of the first magnitude.

Both the practical and the facetious man has many suggestions to offer, and both have contributed much toward solving this great problem. With the best grades of crude rubber selling around half a dollar a pound and scrap rubber almost a drug on the market, the junk man will pay only fifty cents to a couple of dollars for a tire that when new cost $20 to $75. Plans to get more than the junk man offers have therefore appeared by the score.

THE BUSINESS OF SALVAGING USED TIRES.

The most feasible uses for discarded tires have been developed by rebuilding the best of them, dissecting the badly damaged ones in large quantities, reclaiming the rubber, stripping the fabric and using it again in numerous lines of manufactured goods. With tire duck selling at three to four times pre-war prices, weavers scarcely able to keep pace with the demand and a shortage of the best long-staple cotton, good peeled tire fabric has a monetary value worth considering; it is now the chief value of an old tire.

Ash Sifter Made from an Old Tire and Wire Screen.

Repairable casings of guaranteed makes, prematurely discarded but not worn out, are first selected for rebuilding. Tires with perfect beads, only minor defects of fabric, but one or two small blowouts and no rim-cuts or loose plies are the ones chosen. The beads are first removed with a bead trimmer, the bead fabric stripped off for reclaiming and the hard rubber bead cores ground fine for use as hard rubber dust. The various plies of fabric are separated by a fabric stripping machine. This pulled fabric, single or multiple ply as specified, is extensively used in rebuilding and repairing tires, and for the manufacture of blow-out patches and reliners, as well as for a variety of small rubber articles requiriing strong fabric. Tire accessories made up from sound pulled fabric, properly prepared, are recognized as equal in serviceability to such articles produced from new fabric.

PATENTED USES FOR OLD TIRE MATERIALS.

Quite apart from tire repair and manufacture, many new uses are being found for peeled fabric. Within the past year many patents have been taken out both in the United States and abroad.

Under F. L. Harley's United States patent No. 1,285,992 a new built-up fabric product is made by stripping the rubber from the tire carcass and subjecting the fabric body to heat and heavy pressure in order to thoroughly compress the rubber particles with which the fabric is impregnated and to vulcanize the two together. The resultant stock is then cut into pieces of proper size and shape for the purpose intended, the waste being ground up, reduced to a mass, spread over and by pressure applied to the cut pieces, thereby forming a built-up stock.

J. J. Dettling and E. A. Tinsman in United States Patent No. 1,309,118 protect a method of stripping the built-up plies of fabric of a tire carcass from each other and reshaping segmental portions with the addition of rubber into leggings of fixed shape and outline.

According to British patent No. 121,043 of 1919, attachable soles and heels, heel tips and protectors are made by vulcanizing a layer of rubber or rubber substitute on to a foundation of waste canvas from tire covers or waste balata belting.

U. Chandeyson's French patent No. 488,979 of 1919 covers the utilization of used or unused pneumatic tires for the manufacture of soles, heels, shanks and uppers for shoes; of gaiters, saddle bags, etc.; and more generally of all articles of rubber or rubberized fabric.

Basket Frames for Basket-ball Are Easily Evolved from Discarded Bicycle Tires.

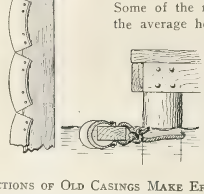
Another French patent, No. 490,382 of 1919, granted to V. C. Thénant and L. Méliorat, is for the utilization of pneumatic tire casings for making lounging shoes of all kinds.

THE FUTURE OUTLOOK.

Probably this is but the beginning, and many patents along these lines will follow. Converting old tire materials to new uses promises to become a great business in itself. Outlets for the stripped fabric are already developing rapidly, which takes care of one of the two principal factors. And new uses for great quantities of low-cost reclaimed rubber will soon be found to take care of the other factor. This latter field is one for the opportunist, the rubber chemist and the man of vision. The above are but a few of the suggested uses, however, some serious, some facetious.

HOME USES FOR OLD CASINGS.

More numerous and varied are the suggested uses for discarded tire casings. Some of the most amusing are those for the average home. To begin the list, an old casing with a circular piece of wire screen cloth attached to one of the beads in place of the rim makes an efficient hand sifter for coal ashes. A lawn sprinkler of the ring type can be made by attaching a garden hose connection through the tread, punching numerous holes through one of the side walls and stitching the clincher beads



Sections of Old Casings Make Efficient Dock or Float Bumpers.

together, applying cement and vulcanizing to make the ring water tight. Two or three sections of an old casing cut to proper lengths, the cut ends being sewed together with waxed thread to form rings of suitable diameter provide the basis of excellent tree-guards. Protective strips of wood are then placed vertically around the tree and lashed to the rings with tarred rope. Short lengths of old casings are useful for temporary repairs to leaky eaves gutters, and clincher beads cut from casings may be nailed to the bottoms of doors for weather strips. A novel baby's walking chair can be made with two old casings, one held above the other by a series of spokes from an old wire wheel run through them vertically and provided with several casters at the bottom. Probably a revolving wheel for pet squirrels could be made in much the same manner.

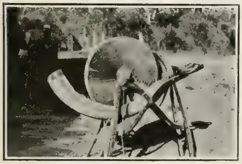
IN ATHLETICS AND RECREATIONS.

The gymnasium, athletics and outdoor recreations have brought forth a few ideas. In an improvised gymnasium two old casings may be provided with dependent nets and used as the baskets for basket ball. One such casing properly suspended and rigged makes a strong and nearly noiseless punching bag frame.

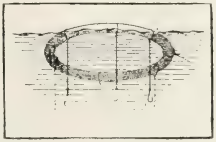
Tire sections of uniform length laced together along the beads and hung over the sides make effective motor boat buffers. They are also good dock and float bumpers when similarly attached. Small size whole casings encircling the wharf piles and supported by wooden floats within them are effective at all tides. Clowns and jugglers might even use old tires instead of the conventional circus hoop.

FARM USES.

On the farm quite as many schemes have been thought of. Pieces of tire casing cut to proper shape and combining tread rubber and fabric, it has been found, are effective for tapping heavy farm shoes to prolong their wear. A length of tire casing furnishes a convenient flexible means of conducting water occasionally from the pump to a trough nearby, yet does not prevent filling pails at the pump direct. Half a tire casing hung under a grindstone and filled with water gives an automatic stone wetter that will not rust. With four old casings and two tackle blocks a sling can be rigged to lift sick animals to their feet or support them while helpless. Old tire casings laid over the floor of a truck body afford an excellent shock absorbing layer on which to pile crates of eggs or other fragile merchandise. A pile of them in diminishing sizes and suitably fastened together has been suggested as a near approach to the much pictured conventional beehive. With a larger entrance cut at the base a small dog kennel could be made in the same way.



A Grindstone Water Trough Devised from an Old Casing.



An Inner Tube Makes an Improvised "Trot-line."

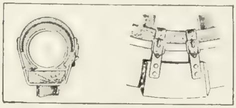
REPAIR SHOP SCHEMES.

In a small repair shop old tires have their uses quite apart from furnishing patch stock for tubes and pulled fabric for stopping up blow-outs. A whole tire suspended over the door with a circular canvas replacing the wheel makes an excellent sign on which to paint the proprietor's name. A segment cut from a giant truck tire and mounted on a wooden stand provides a water trough in which to test patched inner tubes.

IDEAS FOR THE GARAGE AND CAR.

For the home garage and the car itself there are still other uses to which old casings may be put. Cut into quarter sections and fastened to the sides of a garage door they make excellent bumpers. Old tires can be made to save new ones by using sections of them spread flat to pad the automobile stand. Similar sections of rim-cut tires with the non-skid tread little damaged can be attached to the running board of the car and used as mats for wiping the feet.

Turning to more practical ideas, an old casing cut into sections and with edges skived to form a very gradual beveled edge provides a useful collection of home-made blow-out patches. Rim-cut tires with the beads cut away have been used as overshoes to prolong the tread wear of tires of smaller size, while the fabric carcasses of discarded tires with beads and all rubber removed have furnished many reliners to reinforce weak tires a size larger. The overshoes may be sewed to the tire or held in place by occasional straps riveted to the edges and passing from side to side about the felloe of the wheel.



Emergency Tire Boots Can Be Made from Sections of Old Tires.

USES FOR DISCARDED INNER TUBES.

It should not be forgotten that more inner tubes are scrapped than are tire casings. As they are free from fabric, however, they are reclaimed more easily and do not present the problem that is found in the worn out casing. Suggestions as to their use are, nevertheless, multitudinous.

A Garden Sprinkler Evolved from an Old Inner Tube.

The whole inner tube, when too much patched to risk in a tire, yet still air tight, has several uses suggested and actual. Its buoyancy on the water when inflated is the delight of the bathers learning to swim, while fishing lines suspended from it are said to excell a "trot-line," as the motion of the waves jiggles the hooks and attracts fish to the bait. It is an effective life preserver, and in a double sense, for bootleggers have used the spare tires on their cars as containers for beverages having an alcoholic content greatly in excess of one-half of one per cent. With a length of pump hose attached to the valve stem an inner tube can be filled with water under pressure, slung over the shoulder and used to spray plants. To fill, slip the hose over a faucet and press the valve. Inner tubes have been used as tow lines for disabled automobiles, and they furnish swing ropes that give much amusement to children.

Part of an inner tube, including the valve, makes a serviceable

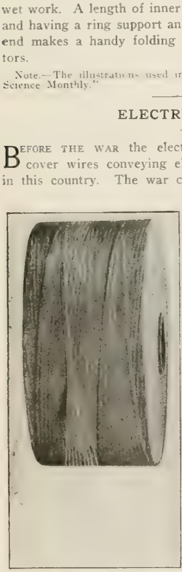
air pressure chamber for a brazing or soldering torch. The cut ends of the tube may be sealed by two clamps consisting of two pieces of wood drawn together by screws. The bag is inflated in the ordinary manner by a tire pump. For an outlet hose connection, a second valve stem and base from another discarded tube should be attached to the tube section and the valve inside removed.

Inner tubes cut with shears transversely into narrow strips furnish excellent elastic bands to put around documents. Lengthwise strips cut from them offer good substitutes for the long, slender coil springs used for sash curtain rods and to close screen doors. Pieces of all sizes and shape may be used for patch stock for mending other tubes, hot water bags, boot legs and various rubber articles. With the aid of shears and rubber cement, aprons and even overalls can be made out of large truck tire inner tubes for protection when washing cars or doing other wet work. A length of inner tube closed with cement at one end and having a ring support and handle of heavy wire at the other end makes a handy folding dipper for filling automobile radiators.

Note.—The illustrations used in this article were furnished by "Popular Science Monthly."

ELECTRICAL YARNS.

Before the war the electrical or insulating yarns used to cover wires conveying electricity, were spun almost wholly in this country. The war caused the demand for them to increase greatly, because insulated wires were used for new purposes, as, for instance, the airplane magnetos, which demanded very fine qualities. The yarns had to be imported, the amount in 1918 being 651,887 pounds, whereas in 1914 the importations were 12,256 pounds.



Group-Wound Yarn for Wire Insulation

The electrical yarns imported are all gray, combed, mule-spun, single yarns, made of long-staple cotton, chiefly Egyptian (Abbassi (white Egyptian) or Joannovich. The growing of these cottons has nearly ceased and in 1918 much yarn of inferior tensile strength, in which American Allen seed was used instead of Abbassi, and Mitafifi (brown Egyptian) in place of Joannovich, was imported. For extremely fine combs Sea Island cotton is essential; that was cut off by the British restrictions on the exportation of Sea Island, and by the ravages of the boll weevil in this country.

In 1914 the chief item of import was 8,058 pounds of 117/1; in 1918 there were imports of 301,441 pounds of 97/1, of 181,829 pounds of 98/1, of smaller amounts of 78/1, 120/1, 140/1 and 117/1 and of a very little 200/1. Part came with a multiple number of single ends wound together on cheeses (tubes or cones), and part with one thread on large warp caps. The leading import is usually described on invoices as "97s super combed Joan twist on cheese, 6 ends laid flat," which, being interpreted, means that it is made of Joannovich Egyptian cotton, carefully combed, spun with a warp twist, and put up on cheeses with 6 ends wound on side by side. The number of ends grouped together in winding varies from 3 to 30, though 5 or 6 is the usual number. Occasionally the yarn is invoiced as 6/97, 12/97, 30/97 and so on; this would indicate, first, the number of single yarns twisted or folded together, and, second, the individual yarn count; namely, that 6, 12 or 30 ends of 97s had been twisted together to make ply yarns. This would be misleading for electrical yarns, as they had not been twisted together.

Electrical yarns imported on warp caps are usually sold to thread mills or to firms which have facilities for winding them on cones and grouping together the number of ends desired. They supply electrical firms who use braiding machines in covering the bare copper wire with the grouped yarn. Yarns which come already grouped are readly for braiding. The English winding charges are low, but if the patented Universal machine is used for patent spools, they charge more than is customary in this country for the same work. The electrical yarns are supplied chiefly by Manchester and Bolton; some spinners do their own exporting, but in 1918 half the imports were in the hands of one Manchester agent who passed them on to one American firm.

Imports of Electrical Yarns by Counts.

Count		1914.	1918
78/1	pounds	....	74,080
97/1		.....	301,441
98/1		1,022	181,829
117/1		8,058	14,324
120/1		1,131	45,797
140/1		46	21,588
Other		1,999	12,828
Totals		12,256	651,887

Imports by Sources.

		1914.	1918.
Manchester	pounds	11,956	371,210
Bolton		......	209,907
Middleton Junction		.....	49,325
Bradford		......	18,997
Other		300	2,418
Totals		12,256	651,887

Importers' Prices for 98/1 Electric Gray Counted Electrical Yarn, Per Pound.

1916—March [illegible], $1; July 18, $1.20; October 17, $1.46. November 17, $1.90.
1917 April 9, $1.85; April 11, $1.90.
1918—September 1, $2.35; November 11, $2.85.
1919—March 10, $2.20, and importations stopped.

Cost Per Pound for Winding Parallel Ends on Tubes.

Year.	Count.	6 Ends.	10 Ends.	24 Ends.	30 Ends.
1914	100s	0.1074	0.0812	0.0704	0.0672
1915	100s	.0946	.0827	.0715	.0670
1916	100s	.1054	.0769	.0640	.0587
1917	100s	.1055	.1113	.0958	.0896
1918	100s	.0999	.1389	.1193	.1113
1919	100s	.1445	.1525	.1312	.1228

WOULD STIMULATE FOREIGN TRADE.

A special invitation has been extended to members of the rubber industry to attend the Seventh National Foreign Trade Convention to be held in San Francisco, May 12-15, when special trade advisers will be present from the Far East, Australia and South America, and may be consulted by American business men. The Los Angeles and Seattle Chambers of Commerce are preparing special trade exhibits and a large number of Americans who are now doing business in foreign countries have been invited to attend. The National Foreign Trade Council is headed by James A. Farrell, president of the United States Steel Corp., and among the active members are A. C. Bedford, chairman of the board of the Standard Oil Co. of New Jersey; Robert Dollar, president of the Robert Dollar Co., San Francisco, California; Alva B. Johnson, former president of Baldwin Locomotive Works, Philadelphia, Pennsylvania; William Cooper Procter, Procter & Gamble Co., Cincinnati, Ohio; W. L. Saunders, chairman of the board, Ingersoll-Rand Co., New York City; John N. Willys, president of Willys-Overland Co., Toledo, Ohio; and Thomas E. Wilson, president of Wilson & Co., Chicago, Illinois. It is pointed out that Europe's debt to the United States means a drive of imports, and methods of offsetting it by expanding exports will be one of the chief subjects of the convention. Such kindred subjects as credit information, direct and commission selling, financing of foreign trade, etc., will be discussed.

Some Labor Problems in the Rubber Industry.

The post-war period has presented to the rubber manufacturer labor problems undreamed of in the cost-plus, work-or-fight era from which we have just emerged. Radicalism and strikes have fortunately been less frequent and serious than in many of the allied industries, but this circumstance has not blinded the manufacturer to the necessity of a fair and liberal labor policy. For enlightened production, men realize that a high labor turnover is expensive.

Acting upon this principle, they have granted two wage increases in the rubber shoe field during the past six months and have secured the cooperation of the workers themselves by more intelligent welfare work, shorter hours, schools for non-English speaking employes and schools for foremen, all of which have helped toward the goal of increased production.

WOMEN WORKERS INCREASING.

Owing to the war the influx of women in rubber manufacturing of all kinds has been notable. Twenty per cent of the factory work in the plant of The Goodyear Tire & Rubber Co., Akron, Ohio, is done by women. Among the jobs performed by women workers are: finishing tires, cutting and splicing fabrics for balloons, weighing rubber, molding and trimming rubber heels, operating electric trucks, running machines for refining and straining reclaimed rubber, running rubber washing machines, splicing and trimming tire tread bands, making tubes, and separating sheets of rubber. The war also proved that the work of time clerks, inspectors and stock room attendants is ideally suited to women workers. In the rubber shoe industry women have been employed from the beginning. They are used in the cutting room for sorting and booking work, in the preparatory departments for stitching tennis uppers, making quarters, cementing linings and inside work, and in making gum shoes and gaiters. Inspectors and forewomen in these departments have nearly all graduated from the bench. Among the more recent jobs for which women are being trained are making boots and heavy gaiters, formerly done exclusively by men, and operating clickers and cutting machines. The introduction of sole layers and machine lasters has removed the former obstacle of strength required to perform these operations.

The bettering of working conditions has been a direct result of the increased number of women workers. The factory nurse and the rest-room have been introduced. Some factories make a practice of serving hot coffee or tea during the morning hours. Boarding and lodging houses, even in the larger cities, and day nurseries where mothers can leave their children under competent care while at work, are signs of the times.

HOW TO ENCOURAGE REGULAR ATTENDANCE.

Irregular attendance is the greatest problem with female help. In rubber shoe manufacturing this not only means loss of production but also the danger of valuable material, cemented and prepared for making, becoming air cured and scrapped. One factory takes care of this by having several "drop" teams of workers who make up the tickets of the girls who are out. Others have tried giving a weekly bonus for perfect attendance, but in these days of high wages this scheme has lost its appeal. A more recent idea has been the creation of a spirit of rivalry between team and individual workers for the best record of "firsts" with a prize for the winners which they hold only so long as they can maintain their record.

Still another idea has been the "committee" system in accordance with which groups of workers are organized under the heads of "attendance" committees, committees on "economy and efficient production," etc. One objection to this system is that if it is not carefully handled it may create jealousy among the operators, and be looked upon either with suspicion or jealousy by the girls not included.

Baseball teams in the summer, and a bowling league with each department represented by a team in the winter, serve to stimulate teamwork and interest among the men, and if this interest is fostered by the factory paper it will often lead to beneficial results. Foremen and executives can help matters a great deal by showing a knowledge of the games and interest in them by their attendance at matches between rival teams. Along the same lines, one factory holds a dance every day during the noon hour and reports that it helps a great deal toward keeping the women workers in regular attendance and contented and happy.

FAULTS OF THE EMPLOYMENT DEPARTMENT.

The employment department in itself is not especially new, but manufacturers are watching and studying it more closely than ever. How does it function? Are the applicants for employment examined for the job to determine their qualifications or are they picked in hit-or-miss fashion? If there is no job available for the applicant at the time, how is he turned down? A letter from a rejected applicant woke one concern up to the fact that it was losing its reputation and help as well by the cold-blooded policy of its employment department. The man had waited an hour and a half for an interview only to be told finally by an office boy that all the jobs had been filled. He had no opportunity to talk to anyone in authority and went away in an exceedingly bitter frame of mind.

One morning not long ago a man about 45 years old and of slender build walked into the employment bureau of a rubber company and asked for work. The only job available was trucking rubber from the freight cars to the stock room. "It's a very heavy job. I don't know whether you would want it or not," he was told. "How heavy?" asked the man. "Oh, the rubber weighs from 200 to 300 pounds a load," was the answer. The man was obviously unsuited to the job, yet he hesitated. He needed the work. "Take it or leave it," was the impatient rejoinder from the narrow, forbidding ticket window. The man did not take the job, but if he had he would have been allowed to take it. Many of the large concerns now require a physical examination of all applicants, and in this case, it would have been a protection for the worker as well as for the employer.

START THE NEW WORKER RIGHT.

Much depends upon the first day on the job for the new employe. If he is kept idle for several hours waiting for the busy foreman to assign him to his task, he naturally forms the impression that time doesn't amount to very much in that particular plant. There are many things he wants to know about the working conditions which very often he has to pick up from his fellows. When do they pay? How much time do they have for lunch? Any morning rest periods? Any smoking privileges? Where are the sanitary accommodations located? These are little things, but to the new man they are the things he naturally wants to know.

Nearly all of the waste of material and petty pilfering caused by green employes can be laid at the door of the foreman who failed to instruct his men. The workman who cut a piece of tire duck from the roll and used it for a towel was not wholly to blame. Not more was the apprentice shoemaker who mixed her upper scrap with the friction trimmings. Breakage of cases in the packing and shipping room is a loss often allowed to continue without any attempt to check it. "Pat, you wouldn't tear up a five-dollar bill, even if it wasn't yours, would you? Well,

that case you just smashed cost this company just that," may sound trite, but it is often effective. The war and this era of high prices have taught workers to save through Liberty Bonds and War Savings Stamps, and the lessons can very readily be applied in the shop. Getting started right is half the battle. The shipyards and munition factories demonstrated that green workers often turn out better than experienced hands because they had nothing to unlearn. It was possible to teach them the exact methods of the concern without encountering opposition due to methods learned in other shops. The story is told of an experienced carpenter employed in an airplane factory. All his life he had been used to trimming off ends of boards that stuck out. He ruined $700 of seasoned ash in a very few minutes by sawing off the ends of some partially constructed planes.

Some factories separate the training of apprentices entirely from the regular departments, particularly in the case of shoemakers, tire builders, etc. In the mill room there is opportunity for training operators through various stages. Operators come in as helpers, whose duty it is to change rolls and carry stock; later they become mill men, then assistant calender hands, with the chance to become calender men. Similarly in the cutting room, workers can start as stock carriers and work up to clicker and Parsons machine operators.

RUBBER WORKERS OF THE OLD SCHOOL.

But what of the old rubber workers who served their apprenticeships forty years ago? No rubber shop to-day is complete without them. What a picturesque lot they are, plying their knives with sturdy strokes over in the far corner of the cutting room where the long rows of machines have crowded them! They openly scoff at the youngsters, to be sure. But spend a lunch hour getting acquainted with them. They will tell you of rubber shops long since closed and incidentally give you a friendly tip on foremen who have come and gone. They swear at the makers who are always "short" and ask you where they lose or scrap the work, yet they cut it over just the same. They chew tobacco and take snuff, but what of that? There are few industries to-day which have as loyal and as hardworking men in the ranks as these fellows of the old school.

THE IMPORTANCE OF EFFICIENT FOREMEN.

Rubber factory executives have gradually learned to appreciate the fact that the labor problem rests a great deal with their foremen. The college professor who went into the steel mills during the war disguised as a laborer, was not far wrong when he said to the general manager, "Your men are fine; but your foremen are a bunch of blackguards and slave drivers." Foremen are being sent to school not only to learn the technical side, but also to emphasize the human side. The day has gone when the foreman can order his men as a sergeant would a platoon. In those days there was a line of men waiting outside to take the job of the man who fell down. To-day that man can go across the street and get as good a job or better. And he knows it. He cannot be bullied or coddled. The foreman fires a man to-day only as a last resort in exceptional cases. When he does, he has lost.

It is an unwarranted assumption to take it for granted that the workman is interested in the product. He is not. He is only there because it brings him the wherewithal to get what he wants and needs. And their interests are as wide apart as the two poles. "John, how is the new baby getting along?"—"Mike, are the hens laying well?"—"George, have you got your house painted yet?"—these are the things that interest men. I saw a foreman not long ago stop to admire the pictures of three children, proudly displayed by their father, a rubber worker. The man was a piece worker, yet he stopped five minutes to display them. That production time lost was more than made up to the company by the good-will it created. Usually the way a man feels toward his foreman is the way he feels toward the company and his job.

MAINTAINING PLANT MORALE.

A wide-awake executive can scent trouble in his plant and nip it in the bud. It takes very little these days to start wild rumors. Some petty grievance of a workman is magnified by gossip; piece rates obviously unfair; carelessly worded and ambiguous notices; petty rules; a thousand little things can impair morale irretrievably if not watched. Not many weeks past I heard a workman berating the company as crooked. His argument was based on a story that six months previously a workman had left, having paid six installments on a Liberty Bond, amounting to five or six dollars, and the company had only returned 50 cents to him. Upon investigation it was found that there was nothing to the story at all; but that did not prevent it from being repeated and doing harm.

Many pay-rolls are full of unfairness, due to the weakness in management which allows a group of workmen to secure a raise for themselves by making threats, while the more efficient yet timid ones plug along at the old rates. Records of work performed are the true basis for promotion. And nothing is gained by secrecy regarding production methods or records. Gradually the old mists which have obscured rubber shops for a quarter of a century are clearing away. Men are beginning to hark back to Solomon who said "There is nothing new under the sun." The old type of foreman who put off with vague and false answers the ambitious workman with a desire to learn has now discovered that his prized trade secrets are no longer of value to anyone except himself as keepsakes. Education, fairness and equal opportunity for all, with the plums for ability, are the new standards.

RUBBER WORKERS A FAVORED CLASS.

Ten years ago the man just out of college who went to work in a factory was scoffed at. Most of the graduates flocked to offices and banks for a "white-collar" job. The personnel of the graduates is changing now; the sons of the mill hands are beginning to outnumber the sons of the directors. And the whole thing is reversed. The factory worker's son seeks the office job, and the director's son is going into the shop. What does he find in the rubber factories? Instead of the bushy-bearded I. W. W. he finds a cheerful, wholesome class of people, proud of their occupation and holding shares in the corporation. If a census were taken of the so-called labor class in the rubber industry many of them would be classed as capitalists. For rubber workers are noted for sticking to their trade, and many are part owners in the shops where they work.

The purpose of this paper is not point out a royal road to a cure-all for labor troubles. There is none. Rather is it to indicate the tendencies of the times which combine to make the problem. The actual solving of it depends upon the individual manufacturer's condition which only he can know and analyze for himself.

LOOKING FOR BETTER HEVEA.

The scientific improvement of plants that are cultivated for commercial purposes in tropical countries is urged as a necessity by Professor W. Bateson in "Production." In his brief survey of rubber, one of the commodities he deals with, he takes the same point of view as that of J. P. Romein in The India Rubber World, October 1, 1919, and proposes much the same mode of action. He thinks the government scientific stations should pick out the best yielding *Hevea brasiliensis* trees and distribute cuttings from them to planters. The attempt to do this on a large scale at Peradeniya in Ceylon was a failure, as only one cutting in 3,000 succeeded, but the method has worked with no great difficulty in other cases. It is from cuttings and not from seeds that improvement in *Hevea* must be looked for.

Rubber Tariffs of Europe.

THE UNITED STATES in 1918 exported manufactured rubber goods to European countries to the amount of $6,055,568, a sum about one-half that obtained for rubber exports in 1917 and less than a third of what Europe paid in 1916. The value reverts to that of the trade before the war. The change from the fiscal year running from July 1 through June 30 to the calendar year, January-December, makes the comparison with previous years, somewhat confusing, inasmuch as the exports for the fiscal year 1917-18 were $9,500,763 but fell off so rapidly in the last six months that the total for the calendar year 1918 was only $6,055,568.

There is a marked decline, not only from the too busy war years, but also from the years before the United States entered the conflict. The only exception is in the item of rubber boots of which there were phenomenal exports in the first months of the year. The best customer was France, which took about two-thirds of all the exports, $4,155,457 worth, and nearly three times as great a value of rubber goods as England, the next on the list.

France's investment was $2,120,031 in rubber boots and $105,570 in shoes; she also took $901,013 of automobile tires and $947,480 of miscellaneous goods including druggists' sundries.

England was the main purchaser of belting, hose and packing, buying $144,724 worth; she took $232,983 worth of rubber boots, $198,022 of automobile tires and $782,386 of miscellaneous goods. Italy, third on the list, invested nearly all her $259,463 in miscellaneous goods; the three Scandinavian countries—Denmark, Norway and Sweden, each bought from $40,000 to $60,000 of American goods and Iceland put $16,833 into chiefly rubber boots and shoes.

The amazing drop in shoes from 2,404,052 pair in 1916-17 to 298,064 pair in 1917-18 and 91,581 in the calendar year 1918 may be due to oversupply, and doubtless in many lines the end of the war left big stocks in government hands. The falling off is partly due to the ability of the belligerant countries to turn men into their own factories, partly to the difficulties imposed on international trading by the drop in the rates of exchange, but seems also due in part to deliberate and aggressive endeavors to win for home manufactures the markets and goods where Americans have been successful; as in the campaign the Dunlop Rubber Co. has initiated and proclaimed.

While the countries which have suffered and are still suffering from the lack of rubber during the war years are letting the tariff bars down for raw materials and even in many cases for manufactured goods, the Entente Powers, even those inclined to free trade, alarmed at American progress, are imposing protective restrictions, which, even if they do not take the form of tariff duties, make it difficult for foreign, and especially American, goods to enter their countries.

The succeeding extracts from the traffic of the principal countries of Europe show the competition to which rubber manufacturers of the United States are subject under existing traiff conditions. Owing to frequent tariff changes the figures and information given below should be periodically verified and small trial shipments made to test the rates:

UNITED STATES EXPORTS OF RUBBER GOODS TO EUROPE—1913-1918.

EXPORTED TO—	Belting, Hose and Packing.	Boots.		Shoes.		Druggists' Rubber Sundries.	Tires.		All Other Manufactures of Rubber.	Total
EUROPE:	Value	Pairs.	Value.	Pairs.	Value.	Value.	Automobile. Value.	All Other. Value	Value.	Values.
Azores and Madeira Islands	....	....	....	233	$167	....	$7[illegible]	....	8[illegible]	$325
Belgium	....	5.990	$32,705	....	....	....	28,718	....	....	61,423
Denmark	$1,539	1	4	1	4	$500	....	....	6,0[illegible]	8,059
France	31,905	577,715	2,120,031	55,076	105,570	36,582	901,013	$49,438	910,898	4,155,437
Greece	2	....	....	....	....	....	2,000	....	1,073	3,075
Iceland and Faroe Islands	80	2,627	5,868	12,238	9,546	85	....	31	1,223	16,833
Italy	2,541	....	....	....	....	21,905	5,426	283	229,308	259,463
Netherlands	....	....	....	....	....	....	215	....	....	215
Norway	27,672	12	81	5	8	960	6,668	300	4,650	40,279
Portugal	4,828	....	....	322	425	1,057	6,918	1,636	5,367	20,231
Russia in Europe	....	1,848	9,240	....	....	....	211	....	....	9,451
Spain	4,393	460	2,029	3,656	1,812	6,382	24,454	....	6,923	45,993
Sweden	....	....	....	....	....	....	18,825	....	....	18,825
Switzerland	4,400	....	....	....	....	....	....	2,467	7,172	14,039
United Kingdom England	144,724	56,243	232,983	20,050	24,140	64,268	198,022	19,665	718,118	1,401,920
*TOTALS, EUROPE	$222,084	644,896	$2,402,941	91,581	$141,672	$131,685	$1,192,542	$73,820	$1,890,824	$6,055,568
Fiscal year, 1917-18	$409,557	35,022	$77,912	1,466,866	$744,122	....	$1,977,029	$235,941	$1,757,353	$5,201,914
Fiscal year, 1916-17	523,273	21,807	53,972	1,011,894	484,379	....	1,764,240	187,187	1,589,556	4,602,607
Fiscal year, 1915-16	311,454	257,219	561,368	1,727,781	1,769,297	....	2,745,450	247,537	1,818,139	7,453,245
Fiscal year, 1914-15	936,220	532,215	1,384,936	1,415,939	695,089	....	10,992,184	1,991,572	3,971,250	19,971,251
Fiscal year, 1913-14	796,165	460,502	1,095,278	2,404,052	1,081,829	....	3,480,114	1,549,094	3,697,306	11,699,786
Fiscal year, 1912-13	526,439	1,391,038	4,384,715	298,064	158,865	$213,612	1,460,518	157,191	2,599,413	9,500,763
1918, July to December 1	98,136	256,446	1,091,613	62,519	111,263	21,375	584,014	69,513	897,658	2,853,572

*Calendar year 1918.

BELGIUM.

Equivalents. Franc, 19 cents; kilo, 2.2 pounds.

CRUDE RUBBER, ETC.

Tariff No.		Duty in Francs.
10.	Raw rubber	Free.

BELTING, HOSE AND PACKING.

33.	Machine belting ....100 *kilos*	30.00
54*b*.	Asbestos, felt, washers, plates, plaited cord and tissues of asbestos, combined or not with rubber. Tubes and pipes of rubber, combined or not with other material......	5% *ad. val*

TIRES.

Ex 10.	Tires (including tires of rubber combined with other material, rubber predominating in weight):	
	Solid tires ....100 *kilos*	65.00
	Pneumatic tires:	
	Covers [1] for automobiles and motor cycles:	
	With studded leather band....100 *kilos*	130.00
	Other	110.00
	Covers [1] for other vehicles, weighing each:	
	Less than 600 grams....100 *kilos*	90.00
	600 Grams and over....100 *kilos*	60.00
	Inner tubes for automobiles and motor cycles...100 *kilos*	170.00
	For other vehicles, including complete single-tube pneumatic tires for racing cycles, composed of a cover and inner tube combined....100 *kilos*	150.00

OTHER GOODS.

10.	Manufactured goods of rubber not elsewhere mentioned.	10% *ad. val*
Ex 27.	(7) Hosiery mixed with silk, including hosiery composed of silk and 50 per cent or less of rubber:	
	Gloves and mittens....100 *kilos*	450.00
	Articles not specially mentioned, containing:	
	Up to 20 per cent of silk:	
	Unornamented ....100 *kilos*	[illegible]
	Ornamented ....100 *kilos*	[illegible]

Tariff No.		Duty in Francs.
	Over 20 per cent of silk	
	Unornamented ....100 *kilos*	400.00
	Ornamented ....100 *kilos*	500.00
33	Tissues impregnated with rubber, lined or not with felt, specially manufactured for making card fillets, are duty free, under the denominations Machines, Implements and Tools. Imports of these tissues can take place only through the Custom-houses designated for the purpose by the Minister of Finance, and subject to the importer's proving to the satisfaction of the Customs that the tissues are really intended for the above-mentioned use. Electric submarine and underground cables are included in Machines.	
64	Elastic tissues of cotton, silk and other material, cotton predominating in weight..........100 *kilos*	320.00

[1] Treads, protectors, etc., when composed mainly of rubber, are treated as complete covers.

BULGARIA.

Equivalents.—Lev, 19 cents; kilo, 2.2 pounds; G., Germany.

CRUDE RUBBER, ETC.

Tariff No.		General Tariff.
307	India rubber and gutta percha, raw or refined..........	Free.

BELTING, HOSE AND PACKING.

313.	Tubes, belts, valves and other manufactures of soft rubber or gutta percha:	
	(a) Pure or combined with tissues or common materials ....100 *kilos*	50.00
	(b) Mixed with other fine materials..........100 *kilos*	200.00

This number includes tire tubes and tire covers for automobiles and cycles (G.)

BOOTS AND SHOES.

312.	(a) Goloshes ....100 *kilos*	100.00
	(b) All other rubber footwear..........100 *kilos*	200.00

OTHER GOODS.

308.	Unvulcanized rubber in sheets, films, slabs, strips; vulcanized rubber thread ....100 *kilos*	100.00
309.	Elastic tissues:	
	(a) Stuffs, bands, ribbons..........100 *kilos*	120.00
	(b) Made up articles..........100 *kilos*	150.00

Ad. No. 309.—This headline includes elastic strips for elastic boots or shoes, as well as all articles in which elastic fabric predominates, even if combined with other materials, such as braces, garters, ribbons, cords, straps, etc. Elastic articles under (a) and (b), combined with silk, shall pay a surtax of 50 per cent.

310.	Fabrics impregnated or coated with rubber, or with rubber sheets inserted ....100 *kilos*	150.00
311.	Clothing and other made up articles and manufactures of rubber, or of tissues impregnated or coated with rubber ....100 *kilos*	300.00

Articles combined with silk pay a surtax of 50 per cent.

314.	Manufactures of hard rubber, such as buttons, combs, cigarette holders, pins, boxes, etc.:	
	(a) Pure or combined with other common materials ....100 *kilos*	350.00
	(b) Combined with fine materials..........100 *kilos*	700.00

General note.—Balata, gutta percha, and ebonite and articles manufactured of these materials are dutiable as india rubber and articles of india rubber.

DENMARK.

Equivalents.—Krone, 26.3 cents; kilo, 2.2 pounds.

MANUFACTURES OF INDIA RUBBER, GUTTA PERCHA, ETC.

Tariff No.		Duties in Kroner.
64.	Boots and shoes, cycle and other tire covers, hose pipes, in combination with textile materials..........*kilo*	0.50
	Ribbons, blocks, edgings, sheets and disks, with or without perforations, belts, rings, tubes, hose, cords, strings, bars, rolls, mats, carpets, horse-shoes, corks, soles, springs and buffers for vehicles, and other similar simple manufactures:	
65.	In combination with textile materials or with other dutiable materials and not elsewhere tariffed..........*kilo*	0.16
66.	Otherwise	Free.
	Other manufactures ....*kilo*	0.70

Tare.—Fancy goods or small wares, in cardboard or wooden boxes not generally sold with the goods in retail trade, 20%.

Otherwise, according to investigation.

	Wax cloth and textile goods impregnated, coated or similarly treated with rubber, gutta percha:	
	If the Customs Department can determine the nature of the textile material:	
112.	If the material is jute only..........*kilo*	0.09
113.	If the material is wholly or in part silk..........*kilo*	3.00
	Other kinds, dutiable as the material.	
114.	In other cases..........	0.70

FRANCE.

INDIA RUBBER, ETC.

Tariff No.		Rates of Duty in Dollars per 100 Lbs. General Tariff.	Minimum Tariff.
620.	India rubber and gutta percha manufactures:		
	Sheets of pure rubber, not vulcanized..........	2.89	[1]1.92
	Threads of vulcanized rubber:		
	3 mm. or less in thickness or diameter..........	0.79	[1]Free
	Other	3.42	[1]2.27
620.	Elastic fabrics:		
	With threads of gold or silver, or of any textile fiber other than silk, or artificial silk..........	44.64	29.77
	With threads of silk or artificial silk, combined or not with other materials:		
	Less than 20 mm. and more than 45 mm. in width	44.64	29.77
	Other widths	89.30	59.53
	Rubberized fabrics in pieces, weighing per square meter:		
	800 grams or more..........	17.46	11.62
	Over 400 and less than 800 grams..........	33.27	22.46
	400 grams or less, containing in the warp and woof in a space 5 mm. square:		
	Less than 44 threads..........	49.89	33.27
	44 threads or more	99.81	66.54
	Articles made of rubberized fabrics weighing 400 grams or less per square meter and containing in the warp and woof in a space 5 mm. square 44 threads or more..........	110.45	66.96
	[2]Clothing, accessories for clothing, and ready-made articles, other than those specified below:		
	Dress shields:		
	Of rubber sheet without cloth..........	18.38	12.25
	Of rubberized fabric or of rubber sheet combined with any fabric other than silk or artificial silk	46.56	30.64
	Of rubber sheet combined with fabric of silk, natural or artificial, pure or mixed..........	62.51	41.66
	Suspenders, garters, belts:		
	Of any textile yarn, other than silk or artificial silk	45.96	30.64
	Of silk, natural or artificial, combined or not with any other material..........	53.14	36.76
	Other	65.66	43.78
	Special rubberized fabrics, jaccards, not set:		
	Without felt	22.05	14.71
	With felt	25.22	16.37
	Footwear of rubberized fabric, lined with felt, wool, or any cloth composed partly of wool..........	27.57	18.37
	Footwear of rubberized fabric, lined with cotton, hemp or flax cloth (*bains de mer*, caoutchoucs, etc.)	22.07	14.70
	Footwear with soles wholly of rubber...*per pair*	0.18	0.125
	Pneumatic tires, casings, inner tubes..........	17.07	11.37
	Brake shoes, solid tires, rough, further manufactured or finished..........	11.37	9.10
	Tires, casings and inner tubes, for cycles, rough, further manufactured or finished—*dutiable as parts of cycles.* (Duty to be multiplied by 1.3.)		
	Belting, tubes, valves and other articles of rubber or gutta percha, pure or mixed, hard or, soft, combined or not with cloth or other materials	13.78	9.19
	(Imports originating in the United States and Porto Rico)	11.82	....

[1] Applies to imports from the United States and Porto Rico. If not otherwise indicated, imports originating in the United States and Porto Rico are dutiable under the General Tariff. Duty is levied on net weight, when the rate is over $2.

[2] Articles of clothing that are stitched, glued, or stuck together are dutiable as made up articles.

GREAT BRITAIN.

Rubber and manufactures of rubber.......... Free

GREECE.

Equivalents.—Drachma, 19.2 cents (nominal value); oke, 2.8 pounds avoirdupois; dramion, 0.111 ounce; n. e. s., not elsewhere specified.

CRUDE RUBBER, ETC.

Tariff No.		General Tariff, Drachmas.	Conventional Tariff, Drachmas.
325*a*.	Rubber and gutta percha, raw or refined..........	Free.	....
b.	Threads of rubber or gutta percha..........	Free.	....
c.	Pieces, sheets, bands, bars, pipes, etc., of rubber and gutta percha, mixed or not with other materials, and hat rims of cotton steeped in gum..........	Free.	....
d.	Diving suits	Free.	....
e.	Elastics for shoes or other purposes, mixed or not with other textile materials, and other similar articles ....100 *okes*	400.00	....
f.	Articles of rubber and gutta percha, n. e. s..........	725.00	400.00
g.	Sheets of rubber or gutta percha, pure or on tissue (except silk tissue) or impregnated tissues, or tissues stuck together by means of rubber or gutta percha..........100 *okes*	400.00	200.00
h.	Ready made clothes and other articles of tissues mentioned in (*g*)..........100 *okes*	700.00	450.00
i.	Tissues of animal or artificial silk, pure or mixed with other textile materials, impregnated, or stuck together by means of rubber or gutta percha..*oke*	40.00	20.00
j.	Ready made clothes and other articles of tissues mentioned in (*i*)..........*oke*	60.00	30.00
85.	Trusses, bandages, rubber nipples, probes, elastic stockings, suspenders, etc..........100 *okes*	100.00	....

HOLLAND.

Equivalents.—Florin, 40 cents; kilo, 2.2 pounds.

There is an import duty of 5 per cent ad valorem on all manufactures of rubber and gutta percha.

ITALY.

Equivalents.—Lira, 19 cents; quintal, 100 kilos, 220 pounds.

CRUDE RUBBER AND RUBBER PARTLY MANUFACTURED.

Tariff No.		General Tariff, Lire.	Conventional Tariff, Lire.
365.	Rubber and gutta percha:		
	a. Raw, solid or liquid	Free.	.....
	b. In threads .... *quintal*	75.00	...
	c. In sheets:		
	1. Cut .... *quintal*	60.00	....
	2. Combined with tissues or inserted tissues .... *quintal*	60.00	60.00
	3. Containing wire or wire gauze...... *quintal*	40.00	....
	4. Other, including plates of hard rubber .... *quintal*	50.00	50.00
	d. In tubes or pipes:		
	1. Of cut sheet........ *quintal*	60.00	....
	2. Combined with tissues or with inserted tissue .... *quintal*	60.00	....
	3. Other	...	40.00

BELTING.

366.	Belting of rubber or gutta percha combined with tissue or with inserted tissue........ *quintal*	60.00	....

BOOTS AND SHOES.

368.	Footwear of rubber:		
	a. Lined, covered or trimmed with another material ....100 *pairs*	200.00	[1]125.00A.G.
	b. Other .... *quintal*	50.00	50.00
267.	(2) Footwear of cotton tissue with rubber soles furnished with a rubber strip by means of which the soles are united to the uppers.......100 *pairs*	....	[2]100.00A.

[1]Convention with Austria and Germany.
[2]Convention with Austria.

OTHER GOODS.

367.	Gummed tissues in the piece:		
	(a) For manufacturing card clothing...... *quintal*	20.00	....
	(The duty fixed for the tissues of this description only applies when these goods are imported by manufacturers of card clothing subject to compliance with formalities to be laid down by the Minister of Finance.)		
	(b) Other (duty on the tissue according to kind)		
369.	Elastic trimmings, ribbons and tissues........ *quintal*	140.00	130.00
370.	Clothing and articles for travel—mixed with tissues.	Duty on tissues with addition of 50%	....
	1. Mixed with tissues of cotton and silk........	....	Duty on tissue with addition of 40% (G.)
	2. Mixed with tissues of wood........	....	Duty on tissues with addition of 35% (G.)
371.	Articles of rubber and gutta percha not mentioned:		
	a. Of cut sheet........ *quintal*	60.00	....
	b. Mixed with tissues........ *quintal*	60.00	[3]60.00G.
	c. Others, including articles of hard rubber not specified .... *quintal*	50.00	50.00

[3]The duty of 60 lire is expressly chargeable by the treaty with Germany for tires, inner tubes, and other coverings of cycle wheels, and by the treaty with Austria for all kinds of carriage tires of rubber or gutta percha mixed with tissues.

NORWAY.

Equivalents.—Krone, 26.6 cents; kilo, 2.2 pounds.

Tariff No.		Duty. Maximum. Kroner.	Minimum. Kroner.
	CRUDE RUBBER, ETC.		
216.	3. *b*. India rubber, gutta percha, balata........	Free	.....
217.	4. India rubber, gutta percha, manufactured:		
	a. In sheets, including rubbered paper, rods, cards or threads, hose cables, blocks, buffers and rollers, even when combined with thread or tissues .... *kilo*	Free	0.40
218.	*b*. Soles, rings, floor mats, pads for horseshoes, even when thread or tissues are inlaid in these articles .... *kilo*	0.30	0.40
219.	*c*. Goloshes and other footwear........ *kilo*	1.00	1.30
220.	*d*. [1]Other not specially mentioned........ *kilo*	1.00	1.30

[1]No reduction allowed for weight of boxes, cards or paper wrappers.

PORTUGAL.

Equivalents.—Escudo, $1.06; kilo, 2.2. pounds.

RUBBER, ETC., CRUDE AND MANUFACTURED.

Tariff No.		Rates of Duty, Escudos.	
47.	Rubber, gutta percha, ebonite and similar composition, crude and prepared........ *kilo*	0.015	
295.	Rubber or gutta percha in waterproof or elastic silk tissues .... *kilo*	2.50	
	Surtax in addition........ *kilo*	0.50	
296.	In waterproof or elastic woolen tissues....... *kilo*	1.50	
297.	In waterproof or elastic cotton or linen issues. *kilo*	1.00	
314A.*b*.	Corsets of mercerized thread combined with rubber or gutta percha........ *each*	2.00	
	Surtax in addition........ *each*	1.50	
440.	Rubber and gutta percha, manufactured, not elsewhere mentioned........ *kilo*	0.60	
441.	Combs .... *kilo*	2,00	
442.	Tubes and thread........ *kilo*	0.025	
557.	Insulated wire........ *kilo*	0.04	
	Ribbons, and belts thereof, all kinds, even combined with elastic, gutta percha, etc.:		
17.	(a) Of silk, pure or mixed with metallic thread. *kilo*	10.00	12.00
18.	(b) Of half silk........ *kilo*	5.50	7.00
19.	(c) Of wool........ *kilo*	1.60	2.00
20*a*.	(d) Other .... *kilo*	1.40	1.70
	Note 2.—In the case of (c) and (d) the weight assessed for duty shall include that of spools, boxes, paper wrappers and similar immediate packing.		
	Clothing and made-up articles of tissue not specially mentioned in the tariff:		
	I. Impregnated or coated with oil, varnish, rubber, etc., or manufactured of such stuff:		
290.	*a*. When the tissue is wholly or partly of silk .... *kilo*	6.00	7.20
291.	*b*. When the tissue is wholly or partly of wool .... *kilo*	2.60	3.50
292.	*c*. Other .... *kilo*	1.10	1.40
394.	Machine belts and transmission belts of all kinds, and sewing machine belts........ *ad valorem*	8%	12%
	Note.—Belts may be admitted free of duty if it is proved that similar articles are not manufactured in Norway.		
395.	Machine packing and engine cables........	Free.	
	Tissues:		
	I. Waterproof, painted, varnished, lacquered, impregnated or combined with rubber or gutta percha:		
694.	*a*. Emery cloth and sand cloth........ *kilo*	0.20	0.25
695.	*b*. Tarpaulins, other goods weighing 250 grams or more per square of half meter side. *kilo*	0.18	0.25
696.	*c*. Roller window blinds........ *kilo*	1.10	1.30
697.	*d*. Oilcloth and other goods, the stuff of which is wholly or partly silk........ *kilo*	2.50	2.50
698.	*e*. Other goods not enumerated in the four preceding numbers........ *kilo*	0.60	0.75
730*b*.	Outer covers for rubber tires for automobiles, all kinds .... *kilo*	0.30	0.40

RUMANIA.

Equivalents.—10 cents; kilo. 2.2 pounds; g.w., gross weight.

Tariff. No.		General Tariff. Lei.	[1]Extra Tax of ½%. Lei.
	CRUDE RUBBER, ETC.		
455.	Crude rubber and gutta percha, in bulk, and broken articles of rubber........100 *kilos*, g.w.	0.50	1.50
	PASTES, ETC.		
456.	Solutions and pastes of rubber.......100 *kilos*, g.w.	5.00	2.00
	BELTING, HOSE AND PACKING.		
462.	Technical articles of rubber, combined or not with other materials, and machine belting combined or with cotton or other materials........100 *kilos*	50.00	6.00
	BOOTS AND SHOES.		
79.	Boots and shoes of any materials, with or without rubber heels and soles........100 *kilos*	650.00	7.50
461a.	Goloshes and tennis shoes........100 *kilos*	120.00	5.00
	OTHER GOODS.		
392.	Braces, garters, belts, with or without rubber thread:		
	a. Plain, of cotton, wool or linen........ *kilo*	3.00	0.08
	b. Ornamented, of cotton, wool or linen...... *kilo*	5.00	0.10
	c. Of silk, pure or mixed, ornamented or not. *kilo*	10.00	0.30
394b.	Artificial flowers and parts of flowers of gutta percha, etc. .... *kilo*	4.00	0.05
457.	Plates and sheets of rubber........100 *kilos*	10.00	2.50
458.	The same combined with tissues, etc.......100 *kilos*	20.00	3.00
459.	Articles of rubber and rubber thread......100 *kilos*	40.00	3.50
460.	The same combined with other materials, but not made up:		
	a. Threads, stuffs, bands, elastic ribbon of rubber threads, covered with common tensile materials, cotton, linen........100 *kilos*	100.00	3.50
	b. The same covered with silk, pure or mixed with other textile........100 *kilos*	300.00	5.00
	(*Note*.—Elastic ribbons with rubber threads covered with textile materials used in making garters, shall be taxed under No. 460 *a* or *b*, as the case may be, even though not containing rubber threads on the edges and having the appearance of ordinary ribbons.)		
461.	*b*. Cloaks, cloth and other made up articles. 100 *kilos*	250.00	6.00
	(Included are articles made from tissues coated with rubber or gutta percha on one side only, varnished or not, or from double tissues with intermediate layer of rubber or gutta percha.)		
462.	All other articles of rubber combined or not with other materials, and intended for medical or professional use ....100 *kilos*	50.00	6.00
463.	Articles of vulcanized rubber, combined or not with other common materials, such as combs, vaporizers, rulers, paperweights, pads, articles of dress, and other similar wares........100 *kilos*	240.00	7.00
750*c*.	Insulated cable and wire........100 *kilos*	15.00	3.50
771.	[2]Toys ....100 *kilos*	85.00	3.00
809.	Chemicotechnical specialties:		
	b. Special rubber ....100 *kilos*	100.00	0.05

[1]A tax of ½ per cent is levied on the value of merchandise imported or exported through Rumanian ports.
[2]By convention the duty for Germany is 50.00 lei.

SERBIA.

Equivalents.—Dinar, 19 cents; kilo, 2.2 pounds.

Tariff No.		General Tariff, Dinars.	Conventional Tariff, Dinars.
	CRUDE RUBBER, ETC.		
100.	(i) Rubber, gutta percha, balata, substitutes, not manufactured	Free.	Free.
	PASTES, ETC.		
252.	Rubber and gutta percha cements ....100 *kilos*	12.00	....
392.	Soft rubber paste.........................100 *kilos*	50.00	30.00
401.	Paste of hard rubber, vulcanized or not....100 *kilos*	100.00	30.00
	BOOTS AND SHOES.		
395.	Rubber boots and shoes, even combined with textile and other material....................100 *kilos*	250.00	140.00
	TIRES, ETC.		
394.	Rubber tires for carriage wheels, covers for same, wheels, etc. ....100 *kilos*	150.00	120.00A.
	OTHER GOODS.		
392.	Rubber, gutta percha, balata, refined, mixed or not with other material, colored, vulcanized or not, in pieces, plates or patent sheets, but not further manufactured ....100 *kilos*	50.00	30.00
393.	Rubber threads:		
	(i) Solely of rubber..................100 *kilos*	100.00	50.00
	(ii) Covered with other materials......100 *kilos*	200.00	100.00
394.	Tubes, straps, strips; also tissues saturated or coated with rubber and gutta percha, with linings or layers of rubber and gutta percha, or with layers of tissues, even combined with common metals and their alloys................100 *kilos*	150.00	120.00A.
396.	Floorcloths, even combined with other materials ....100 *kilos*	150.00	120.00
397.	Tissues, felt and knitted stuffs, coated or saturated with rubber or gutta percha or with a layer of rubber or gutta percha:		
	(i) Silk or half silks..................100 *kilos*	300.00	300.00
	(ii) Other textile goods................100 *kilos*	200.00	130.00
398.	Articles not otherwise mentioned of soft or vulcanized rubber, also wholly or partly covered, or saturated with rubber:		
	(i) Solely of rubber or combined with common or fine material ....100 *kilos*	450.00	150.00
	(ii) With the finest materials..........100 *kilos*	600.00	300.00
	(iii) With precious metals:		
	a. With gold ....100 *kilos*	1,000.00	700.00
	b. With silver........................100 *kilos*	800.00	450.00
399.	Elastic tissues, knitted goods and trimmings of every kind if the yarns are of:		
	(i) Silk or half silk..........................	300.00	220.00
	(ii) Other textile materials:		
	a. For shoemakers	150.00	120.00
	b. Other	200.00	170.00
	(*Note.*—Embroidered goods of this kind pay a surtax of 30 per cent.)		
400.	Tissues and other manufacturers of rubber, or of other stuffs, combined with rubber or gutta percha for technical purposes, not mentioned or included elsewhere ....100 *kilos*	60.00	36.00
	(*Note.*—Clothes and other goods of this kind made up with glue are dutiable as finished goods.)		
401.	Hard rubber or gutta percha in sheets, bars, threads, polished but not further manufactured; unmanufactured sheets combined with other materials; unwrought stamped wares............100 *kilos*	100.00	30.00
402.	Tubes of hard rubber....................100 *kilos*	200.00	120.00
403.	All other goods of hard rubber and gutta percha, combined or not with other materials if thereby they do not come under a higher duty:		
	(i) Of rubber alone or combined with common or fine materials....................100 *kilos*	400.00	200.00
	(ii) With the finest materials..........100 *kilos*	600.00	300.00
	(iii) With precious metals:		
	a. With gold ....100 *kilos*	1,000.00	800.00
	b. With silver ....100 *kilos*	800.00	600.00
	(*Note.*—Goods of imitation rubber or gutta percha are duitable as if of rubber and gutta percha.)		

SPAIN.

Equivalents:—Peseta, 19 cents; kilo, 2.2 pounds; n. w., net weight; g. w., gross weight.

For the purpose of the application of the privileged treatment resulting from different commercial treaties and conventions in force the countries are divided into four groups:

Group 1. Countries bound by treaties at present in force:—Denmark, Norway, Netherlands and colonies, Portugal, Switzerland and Sweden.

Group 2. Countries entitled to all customs benefits, save such as are accorded to Portugal, Germany, Andorra, Annam, Austria-Hungary, Belgium, Bolivia, Bulgaria, Costa Rica, Egypt, United States and Porto Rico, Cuba, Chile, China, France and Algeria, Great Britain and colonies, Greece, Guatemala, Japan, Luxemburg, Morocco, Mexico, Nicaragua, Paraguay, Persia, Peru, Argentina, Rumania, Russia, Salvador, Servia, Siam, Tunis, Turkey, Uruguay and Venezuela.

Group 3. Nations entitled to benefits of duties of second tariff:—Colombia and Ecuador.

Group 4. Countries subject to duties in first tariff. All countries not enumerated in the foregoing groups.

In order that goods and produce of countries mentioned in groups 1, 2 and 3 marked with letter C, in the tariff, may enjoy benefit of the lowest rates of duty or, as the case may be, of those stipulated in the second tariff, it will be necessary to present a certificate of origin.

RUBBER, CRUDE OR PARTLY MANUFACTURED.

Tariff No.		First Tariff Pesetas.	Second Tariff Pesetas.
695.	Rubber, gutta percha and similar materials, raw or manufactured into threads (g. w.)............*kilo*	0.06	0.06
	BELTING, HOSE AND PACKING.		
696.	Hose pipes, tubes, rings and sheets, strengthened or not with iron or brass wire, cloth or other materials (n. w.).........................*kilo*	2.00	1.30
697.	Belts, washers, packing, discs, valves, horseshoes, combined or not with other materials (n. w.)..*kilo*	3.00	2.00
	BOOTS AND SHOES.		
700.	Elastics for boots and shoes (n. w.)............*kilo*	3.00	2.70
	Treaty with Switzerland (n. w.)....................	....	2.00
703.	Boots and shoes, combined or not with other materials, except leather (n. w)..............*kilo*	4.00	3.00
	TIRES.		
697.	Solid tires of rubber for carriages (n. w.)......*kilo*	3.00	2.00
698.	Solid tires of rubber, with metal armor (n. w.)..*kilo*	3.00	1.20
699.	Covers or inner tubes for all vehicles (n. w.)....*kilo*	5.00	2.70
	OTHER GOODS.		
528.	Apparatus and instruments for use in medicine, surgery and laboratories (n. w.)............*kilo*	5.00	5.00
529.	Common gymnastic and orthopedic apparatus (n. w.) ....*kilo*	2.00	2.00
700.	Elastic braces, garters and similar articles (n. w.) ....*kilo*	3.00	2.70
	Treaty with Switzerland (n. w.)..............*kilo*	....	2.00
701.	Waterproof tissues, in the piece or cut (n. w.)..*kilo*	5.00	3.60
702.	Waterproof and other articles of clothing, sewn or not (n. w.)...................................*kilo*	8.00	5.60
	(*Note* 100—By "waterproof tissues" is to be understood tissues coated on one or both sides with rubber, also those saturated inside with this material.)		
704.	All other rubber goods except instruments, toys and writing materials (n. w.)..................*kilo*	6.00	4.00
707.	Toys and games (n. w.).......................*kilo*	4.00	3.00
709.	Writing materials, not specially mentioned (n. w.) ....*kilo*	2.50	1.50

SWEDEN.

Equivalents:—Krona, 27 cents; kilo, 2.2 pounds.

Tariff No.		Duty in Kroner.
	CRUDE RUBBER, ETC.	
631.	India rubber, gutta percha, balata, unmanufactured; also regenerated rubber........................	Free.
	PASTES, ETC.	
632.	Rubber dissolved or in the form of paste (but not rolled into sheets or further manufactured), with or without admixture of other substances; also artificial soft rubber........................*kilo*	0.15
	BELTING, HOSE AND PACKING.	
[1]634.	Sheets not more than 10 millimeters thick having layers of textile material within or around them; other engine packing, insulating materials and packing of soft rubber combined with textile materials, metal or asbestos, or of textile or other material combined with rubber.............*kilo*	0.25
[1]635.	Hoof and other pads (buffers), sheets and engine packing, n. e. s..............................*kilo*	0.50
	Hose and pipes, even if cut in lengths and finished, n. e. s.:	
637.	Spiral piping and protected piping, even if provided with couplings or other fittings......*kilo*	0.30
638.	Hose of cotton, hemp or linen impregnated or not; and coated internally with a thin layer of rubber not more than 2 millimeters thick...	Free.
[1]639.	Other, combined or not with other substances, including so-called inner tubes, unfitted or not, joined without valve patches and valves....*kilo*	0.50
[1]640.	Belting of rubber, gutta percha or balata, combined or not with textile materials.................*kilo*	0.35
[1]645.	Hard rubber engine packing....................*kilo*	0.50
	BOOTS AND SHOES.	
641.	Rubber boots and shoes........................*kilo*	1.20
	TIRES, ETC.	
[1]636.	Solid tires, even if in lengths..................*kilo*	0.80
[1]642.	Rubber parts of cycle and motor cycles, n. e. s., even if combined with other substances, such as outer covers or parts thereof, rubber parts of pedals and brakes..........................*kilo*	1.60
	OTHER GOODS.	
[1]636.	Mats, stoppers, rings for sewing machines, valves, balls for valves and rubber goods n. e. s., for industrial puropses, all combined or not with other materials; cords.....................*kilo*	0.80
[1]643.	Other articles n. e. s., of soft rubber, combined or not with other materials, such as gloves, pails, nipples, ice bags, surgical appliances, and erasers.*kilo*	1.20
	(*Note.*—Manufactures of gutta percha, balata and artificial soft rubber, are treated as manufactures of soft rubber.)	
	MANUFACTURES OF HARD RUBBER, COMBINED OR NOT WITH OTHER MATERIALS.	
[1]644.	Blocks and sheets, even if in pieces cut out and finished ....*kilo*	0.50
[1]645.	Rods, threads, pipes even if in pieces, cut out and finished ....*kilo*	0.50

Tariff No.		Duty in Kroner.
646.	Knife handles and materials therefor	Free.
[1]647.	Other articles, n. e. s., of hard rubber, combined or not with other substances, such as surgical appliances, combs and the like ... *kilo*	1.20
	(*Note to Nos.* 634-47. No deduction from the weight is allowed for boxes, paper and similar coverings, nor for cards.)	
648.	Waste rubber and worn-out articles of rubber	Free.

A ([1]) placed before a number means that the whole is conventionalized, unless otherwise stated; the conventional provisions result from the commercial treaty concluded with Germany on May 2, 1911.

TARE ALLOWANCE.

The tare shall be calculated in accordance with the following percentages, unless the packing is to be included in the dutiable weight of the goods:

For wrappers of a single tissue	2%
For wrappings of double tissues or mats	3%
For barrels or cases	12%
For boxes or bottles of sheet metal	10%
For boxes or bottles of lead, iron or copper	20%
For bottles of glass and flagons or jars of earthenware	40%

SWITZERLAND.

Equivalents. Franc, 19 cents; quintal, 220 pounds.

Tariff No.		General Tariff. Rates per Quintal. Francs.	Conventional Tariff. Rates per Quintal. Francs.
	CRUDE RUBBER, ETC.		
516.	Crude rubber and gutta percha. "Patent Platten," not vulcanized; rubber and gutta percha waste	Free	Free
	BELTING, HOSE AND PACKING.		
517.	Joint rings for w. c. piping	5.00	1.00
518.	Hose, tubes, pipes	10.00	5.00
522.	Hose and tubes with metal joints	20.00	8.00
523.	Belting	30.00	20.00
635.	Asbestos and rubber packing, klingerite rings	.....	12.00
	BOOTS AND SHOES.		
191.	Roughly shaped parts of boots and shoes of rubber or gutta percha	45.00	40.00
198.	Boots and shoes of rubber combined with other materials, except leather	40.00	30.00
	DRUGGISTS' SUNDRIES.		
528.	Waterproof sheeting for sanitary purposes	40.00	30.00
529.	Rubber sponges; molded articles of rubber	40.00	25.00
938.	Surgical and medical instruments and apparatus, including inhalers	40.00	16.00
939.	Trusses, corsets, dorsal and thigh bandages, splints; orthopedic apparatus; dental mastic, sheets of rubber for artificial palates and gums, teething pads worn around the neck, syringes of all kinds; irrigateurs, clyster pumps, etc	50.00	40.00
1161	Elastic stockings	50.00	40.00
	OTHER GOODS.		
517.	Rubber or gutta percha in strips, sheets, plates, plugs, molded articles, threads, balls, rods, rings of rubber without internal layers of another material	5.00	1.00
519.	Threads for elastic tissue	Free	.....
520.	Carpets, mats, etc., with internal layers of metal or tissue	40.00	20.00
521.	Plates, rings, balls, strips, bands, etc.	10.00	5.00
	(Ad. 517-521. Vents, valves, blocks of rubber for brakes; plates of rubber.)		
524.	Carpets and mats	40.00	20.00
525.	Gummed tissues for industrial purposes, stuffs for cards, cylinder covers for printing, insulating stuffs and tapes	.....	1.00
526.	Rubbered stuffs (double) for cart tilts, etc	.....	30.00
527.	Elastic tissues of all kinds for shoes, gloves, braces, garters, etc.	.....	40.00
528.	Rubber coated fabrics and other materials on which rubber is applied	40.00	30.00
529.	Articles not otherwise mentioned, including rubbered fabrics for waterproof overcoats; clothing for laborers working in water; rubber hooters for automobiles; rubber shoes for ladders; molded articles of rubber	40.00	25.00
	(Ad. 516-529. Galalith and manufactures thereof; "stabilite" wares.)		
	ELECTRICAL CABLES AND WIRE; CORE INSULATED WITH RUBBER; GUTTA PERCHA, ETC., NOT COVERED WITH TEXTILE MATERIALS, TWISTED OR PLAITED.		
824.	Cables without lead sheathing or iron armature; insulated wires	30.00	18.00
	(Ad. 824. Copper wire covered with textile materials, wound or braided.)		
825.	Cables with lead sheathing	15.00	12.00
826.	Cables with lead sheathing and iron armature, core insulated with rubber, gutta percha or paper covered with thread or silk twisted or plaited	15.00	12.00
827.	Cables without lead sheathing	30.00	15.00
828.	Cables with lead sheathing	15.00	12.00
1145	Stoppers	60.00	[1]30.00
1159b.	Rubber stamps, rubber erasers	30.00	25.00

[1]Italy, 40 francs.

TURKEY.

All imported goods, except gold and silver articles, precious stones, tobacco, are liable to a duty of 11 per cent.

Government Standard Specifications for Rubber Tires, Tire Repairs and Accessories—II.[1]

SOLID MOTOR TIRES.

Specification GS 1030.

GENERAL. (*a*) This specification covers requirements for "pressed on" type tires provided with the standard channel base band of tire manufacturers, and shall be suitable for pressing on to S. A. E. standard felloe bands for commercial-sized wheels on bands built to S. A. E. tolerance for artillery wheels.

(*b*) Full-sized drawings shall be submitted with proposals showing the exact section of the tires which it is proposed to furnish. Sample section of the actual tire in each size shall also be submitted.

(*c*) See General Specifications for Tires[1], which are a part of hereof.

CONSTRUCTION.

The total weight of tire, weight of rubber, weight of steel base band, together with the total sectional area of tread rubber in tires and also the area of tread rubber above the tops of steel channels must be definitely stated in proposals, and this data will be given due consideration in connection with the prices submitted.

Tires 10 inches in width and larger shall be provided with approved grooving on face of tire.

The tire base band shall be made of open-hearth steel and rolled to approximate finished dimensions. Chemical analysis shall be as follows:

[1] The General Specifications referred to in these specifications were published on page 351, in THE INDIA RUBBER WORLD, March 1, 1920.

Carbon, 0.12 to 0.22—0.17 desired; manganese, 0.35 to 0.55; phosphorus, less than 0.04; sulphur, less than 0.05.

Base bands are to be electrically welded. They shall be truly circular and free from appreciable warp.

Dimensions of base bands: The inside circumference of base bands of tires of standard S. A. E. commercial sizes shall be in accordance with standard practice of tire manufacturers, but manufacturer must guarantee tire shall not come off when applied to standard S. A. E. wheels. Tires made for artillery wheels shall have the inside circumference of base bands made in accordance with dimensions and tolerance given on Ordnance Department drawings.

To determine the effectiveness of the welding process used, pieces of base band metal not less than 8 inches in length will be welded together and turned down to a standard specimen and three such samples containing welds pulled in a testing machine. The total pull required to separate each of the three welds shall be more than 45,000 pounds per square inch of cross section.

In order to determine whether the base bands are being properly welded in production, the inspector may, from time to time, require a weld on the finished tires to be tested in the manner described above. The strength of the welds in production shall be not less than 45,000 pounds per square inch of the section as tested above.

MARKING, WRAPPING AND PACKING.

(*a*) All tires shall have molded on the side of the tread rubber the words "U.S.A." and the tire size, i. e., the width and diameter and also the rubber compound or specification number,

the tire serial number, month and year of manufacture, and the name of the manufacturer.

(*b*) The tires shall also have marked, by stamping deeply into the steel tire channel, the tire serial number and a symbol representing the name of the manufacturer. The above data shall be stamped under the overhanging edge of the steel channel. In case of artillery tires they shall be marked according to blue print submitted.

(*c*) Painting: Paint metal bases with rust-resisting paint.

(*d*) Wrapping: No wrapping required.

(*e*) Marking: Shipping instructions to be shown on printed label pasted to inside of tire band and covered with a protective coating of silicate of soda over the label.

MATERIAL.

See General Specifications.

(*a*) Rubber Compound: The rubber compound shall contain not less than 65 per cent, by volume, of best quality new rubber. If reclaimed rubber or mineral rubber is used, it must be in addition to the 65 per cent of new rubber required, and the manufacturer must declare the amount and kind of reclaimed rubber or rubber substitutes used in his formula. The use of "refined" or ground vulcanized rubber in the compound will not be permitted. Compound shall be free from saponifiable oils or anything made therefrom.

(*a*) The total sulphur shall not be more than 8 per cent of the weight of the new rubber used, except as follows:

If the manufacturer desires to use sulphur-bearing fillers, thereby causing the total sulphur to be over 8 per cent of the weight of the new rubber, he may do so, but shall submit for analysis a sample of the finished unvulcanized stock. Such stock shall not show a sulphur content in the acetone extract of over 8 per cent of the weight of new rubber used.

TESTS.

See General Specifications.

Rubber Compound: (*a*) Physical—

Specific Gravity.	1.40 or Over.	Below 1.40.
Tensile strength	1,800	2,000
Ultimate elongation .... inches	1-4½	1-4½
Per cent set 2 minutes after breaking	40	40

Above based on the average of not less than five samples.

(*b*) Aging. Prepare five flat samples of rubber to be tested; place in an oven for two hours at a temperature of 228 degrees F. After removing from the oven, allow to stand for 24 hours and determine elongation. The reduction in elongation at the breaking point shall be not over 35 per cent.

(*c*) Adhesion. The adhesion test shall be made as follows: Place tire horizontally on platen of tire-applying press, the tire being supported above the lower platen of the press on a steel band having the same diameter as the base of the tire to be tested. Place on the upper side of the tread a band ½-inch thick with inside diameter 1½ inches larger than outside diameter of flange of base band. The corners of the band to be rounded with ¼-inch radius. For the tire to pass successfully the hard rubber must not break loose from the base.

In making ring-adhesion tests of solid rubber tires the applied pressure on a 36-inch tire should be 17 tons and on a 40-inch tire 19 tons. The pressure used on tires of other diameters should be in proportion to these pressures.

Standardization of minimum sectional areas, hard base pressed-on solid rubber truck tires. The following standard of minimum areas is adopted for the various widths of solid rubber tires:

Inches.	Square Inches.
3½	6.75
4	7.75
5	10.75
6	13.75
7	16.75
8	19.75
10	25.75
12	31.75
14	38.75

The areas hereinabove given refer to the sectional areas, including both the hard and soft rubber of finished tires, on standard base bands.

(*d*) Rebound. The rebound shall not be less than 50 as measured on a Whitney rebound instrument. The tire under test shall be held at 70 degrees F. for a period of 24 hours before testing and the instrument shall be mounted rigidly in a vertical position. The tire shall be hung on a solid anvil below the instrument.

(*e*) Road Test. Manufacturer shall maintain at least one truck, used exclusively for test work, which shall average at least 500 truck miles per week, and a sufficient number of tires, at least four, have averaged on rear wheels, at least 7,000 miles.

Test on tire of 5-inch cross-section size, or larger, will be considered as representative of all solid tire cross-section sizes.

INSPECTION.

See General Specifications.

One tire in each lot of 500 (the tire to be selected at random by the inspector) shall be tested, and if the tire fulfills all the requirements of the specifications, the lot of tires represented by it will be accepted, including the tire on which tests have been made. Failure to conform to the specifications in any particular, the lot of tires represented by it, including the tire on which tests have been made, will be rejected. If, however, the maker of the tires demands a further test, three more tires from the lot rejected will be selected by the inspector, and if all tires are found satisfactory, the lot of tires represented by the tires subjected to test will be accepted, the manufacturer to bear the cost of the tires upon which tests have been conducted. If any tire fails in the latter tests, the whole lot will be rejected.

CLINCHER BICYCLE TIRES.

	Minimum.
No. GS 1000	28 by 1½ inches.
No. GS 1001.	28 by 1⅝ inches.

GENERAL.

(*a*) This specification covers the requirements for bicycle pneumatic castings of fabric construction of the sizes 28 by 1½ inches and 28 by 1⅝ inches. They shall be of the manufacturers standard, nonskid, double clincher type and satisfactorily fit, the standard 28 by 1½ inch single clinch all steel bicycle rim.

(*b*) See General Specifications for Tires[1] which are a part hereof.

CONSTRUCTION.

See General Specifications.

(*a*) Carcass of the casing shall consist of two plies of fabric frictioned both sides.

(*b*) The tread of the casing shall not be less than 0.120-inch thick and the side wall not less than 0.032-inch thick when measured on the cured casing.

MARKING, WRAPPING AND PACKING.

See General Specifications.

MATERIAL.

(*a*) Fabric shall be square-woven (26 by 26).

(*b*) Rubber Compounds:

	New Rubber, Per Cent. Volume.
Tread .... minimum	55
Side wall .... do	55
Friction .... do	65

TESTS.

(*a*) Measurements: The cross-section of diameter of each tire inflated to 40 pounds shall not be less than 1-29/64 inches in 28 by 1½ inches and 1-37/64 inches in 28 by 1⅝ inches.

(*b*) Fabric shall have a tensile strength for each warp and filling of not less than 110 pounds per inch or its physical equivalent or cords as approved.

(*c*) Friction: Friction between piles of fabric shall average not less than 10 pounds and between tread and plies or between side wall and plies shall average not less than 9 pounds.

(*d*) Rubber Compound:

	Tread. Minimum.	Side Wall. Minimum
Tensile strength	1,600	1,200
Ultimate elongation	2-10	2-10
Set:		
Stretch .... inches	2-10	2-10
Set .... per cent	25	25

INSPECTION.

See General Specifications.

[1]The General Specifications referred to in these specifications were published on page 351, in The India Rubber World, March 1, 1920.

PNEUMATIC MOTORCYCLE CASINGS.

	Minimum.
No. GS 1005	28 by 3 inches.
No. GS 1006	29 by 3½ inches.

GENERAL.

(*a*) This specification covers requirements for pneumatic motorcycle casings of fabric construction. Size 28 by 3 inches shall be designed to carry a load of 325 pounds when inflated to 40 pounds per square inch; size 29 by 3½ inches, a load of 400 pounds when inflated to 45 pounds per square inch; both designed for S.A.E. clincher motorcycle C.C. rim 28 by 3 inches.

(*b*) See General Specifications for tires which are a part hereof.

CONSTRUCTION.

See General Specifications.

(*a*) Splices on the first ply of fabric shall be gum stripped.

(*b*) Carcass of casing shall consist of four separate plies of tire fabric, with friction coat on two sides and skim coat on one side. The gage of one ply frictioned on two sides and skim

coated on one shall be at least 0.043 inch. Each ply shall have not more than two splices which must be at least seven inches apart, and the splices in the casing shall be at least three inches apart; all measurements on the circumference of the casing.

(*c*) Beads shall be constructed with a core filler as in standard commercial practice.

(*d*) Size 29 by 3½ inches shall have one chafing strip of square-woven fabric weighing not less than 8 ounces per square yard on each side of the casing and shall extend upward on the side of the casing at least ⅜ inch from the channel of the bead.

(*e*) There shall be a cushion of rubber compound applied over the fabric which shall be wider than the breaker. The minimum gage of this cushion shall be 0.0325 inch for size 28 by 3 inches; and 0.045 inch for size 29 by 3½ inches.

(*f*) Over the cushion there shall be at least one breaker strip of open-weave fabric made from long staple cotton weighing not less than 8 ounces per square yard, as used in standard commercial practice, coated on both sides with a rubber compound which shall insure a perfect union between the cushion and tread, after cure.

Breaker Strip for size 28 by 3 inches, minimum width, 1⅞ inches.

Breaker Strip for size 29 by 3½ inches, minimum width 2¼ inches.

(*g*) Rubber Dimensions:

Size ... inches	28 by 3	29 by 3½
	Inches, Minimum.	
Thickness:		
Tread of casing in center ...	[illegible]	[illegible]
Tread, exclusive of non-skid portion in center	⅛	⅛
Side wall ...	0.045	0.050

(*h*) Flap shall be cemented inside of casing.

MARKING, WRAPPING AND PACKING.

See General Specifications.

MATERIAL.

See General Specifications.

(*a*) Fabric must be square woven 23 by 23 from Egyptian long-staple cotton, or its physical equivalent as approved by the Government, weighing 17¼ ounces to the square yard.

(*b*) Rubber Compound:

	New rubber, per cent volume. Minimum.	Reclaimed rubber, per cent weight. Minimum.
Tread ...	65	....
Side wall ...	65	15
Friction ...	75	....
Cushion ...	75	....

TESTS.

See General Specifications.

(*a*) Cross sectional diameter of each tire inflated according to the recommended weight and load schedule of the S. A. E. shall be for 28 by 3 inches, minimum 2-15/16 inches, maximum 3-3/10 inches, and for 29 by 3½ inches, minimum 3-7/16 inches.

(*b*) Shall withstand water pressure without injury, as follows:

Size	Minimum pressure
28 by 3 inches...	250 pounds
29 by 3½ inches ...	275 pounds

(*c*) Fabric: Tensile strength, warp or filling, minimum, 165 pounds.

(*d*) Friction:

		Pounds.
Strength of union between plies of fabric...	minimum	16
Strength of union between breaker and tread...	minimum	28
Strength of union between breaker and cushion...	minimum	28
Strength of union between cushion and carcass...	minimum	16
Strength of union between side wall and carcass...	minimum	10

(*e*) Rubber compound:

	Tread.	Side wall.
Tensile strength, minimum...	2,200	1,500
Ultimate elongation, minimum..*inches*	2-11	2-11
Set		
Stretch, minimum...	2-10	2-10
Set ... *per cent*	25	25

(*f*) Road Tests:

Manufacturer shall maintain at least one motorcycle used exclusively for test work which shall average at least 1,000 machine miles per machine per week, and a sufficient number of casings (not less than six) shall have averaged on the rear wheels at least 4,000 miles.

INSPECTION.

See General Specifications.

AUTOMOBILE TIRE ACCESSORIES.

See General Specifications for Tires[1], which are part hereof.

GS 1070—Blow-out Patches.

They are recommended only for emergency repairs. A vulcanized repair should be made as soon as possible.

Patches shall be made at least six-ply 7-ounce fabric, or its equivalent, as approved by the Government. Plies must be properly stepped down, according to good commercial practice. Two ears are required on all patches. The length of the patch must be according to the manufacturer's standard commercial practice. The 3-inch and 3½-inch must be designed for use with clincher fabric tires and the 4-inch, 4½-inch, and 5-inch must be of ample size for use with cord tires.

GS 1071—Cementless Patches.

They shall be of one standard size, 1½ inches in diameter. The gage and compound of the stock shall comply with the specification for cured back tube stock as given in the Repair Material Specification. Patches molded to a featheredge are preferred.

GS 1072—Reliners.

They are recommended only in case of extreme necessity. All sizes up to 4-inch shall be made of at least three plies, while 4-inch and larger must be made of at least four plies of 7-ounce fabric, or its equivalent, as approved by the Government. The plies shall be built up on the bias, and a lap of at least 6 inches is required and the edges properly stepped off on the sides and skived on the ends to insure against injury to the tube. Each size reliner must be designed so that its width will be such as to properly fit the standard tire of that size. This includes 3-inch and 3½-inch in fabric clincher and 4-inch or larger in cord tires. The edge must stop approximately ¾-inch above the toe of the bead.

GS 1073—Flaps.

Motorcycle flaps must be of the cemented-in type and equal in construction and quality to the flap supplied by the bidder on tires made to Government specifications.

Straight side-cord tire flaps must be of the floating type and equal in construction and quality to the flap supplied by the bidder on tires made to Government specifications.

GS 1074—Fabric Cord Patches.

These patches must be made according to the manufacturer's standard practice from carded Egyptian, combed peeler cotton fabric, or their physical equivalent, as approved by Government, weighing not less than 13 ounces nor more than 16 ounces per square yard.

The plies must be laid on the bias, frictioned or spread and skim-coated on both sides, equally to a minimum gage of 0.043-inch. The compound must fill the specification set forth in the repair material specifications covering friction, skim, cushion, and tube stocks.

All sizes up to 6-inch shall be four plies and 6-inch and above shall be six plies. The patch must be properly stepped down and preference will be given to gum-stripped ends to insure against injury to the tube. There shall be applied in the center of the back of the patch a padding not less than 1/16-inch thick. The minimum length and breadth of the padding shall not be less than the length of pad specified below.

The following sizes are standard and lengths required are given in table:

	Patch, length. Inches.	Length of pad. Inches.
No. **GS 1074X1.**—3½ and 4 inch ...	10	4
No. **GS 1074X2.**—4½ and 5 inch...	11	5
No. **GS 1074X3.**—6 inch ...	12	6
No. **GS 1074X4.**—7 inch ...	13	7
No. **GS 1074X5.**—8 inch ...	14	8

[1]The General Specifications referred to in these specifications were published on page 351, in The India Rubber World, March 1, 1920

VALVE ACCESSORIES.

No. GS 1080X1.

Valves: Schrader's 1936 or approved equivalent for motorcycle tubes.

No. GS 1080X2.

Schrader's 725 or approved equivalent for 3½ and 4-inch auto tubes.

No. GS 1080X3.

Schrader's 792 or approved equivalent for 4½ and 5-inch auto tubes.

No. GS 1080X4.

Schrader's 2033 or approved equivalent for 6-inch tubes and larger.

No. GS 1081X1.

Valve caps: Schrader's 880 or approved equivalent.

No. GS 1082X1.

Valve insides: Schrader's 1801 or approved equivalent.

GS 1083X1.

Tire gage: Schrader's straight Universal gage or approved equivalent for small cars or motorcycles.

GS 1083X1.

Schrader's right angle gauge or approved equivalent for large cars and pneumatic tired trucks.

GS 1084X1.

Pump connection: Schrader's Universal No. 2238 or approved equivalent.

GS 1085X1.

Deflating caps: Schrader's No. 1886 or approved equivalent.

GS 1086X1.

Valve repair tool: Schrader's No. 2395 or approved equivalent.

The power to approve equivalents is vested only in the Government.

REPAIR KITS.

GS 1090.

Repair kits shall be made up with the following material, packed in a round cardboard carton with tin ends and cover, approximately 2½ inches in diameter and 2½ inches deep.

It shall contain:

- Six cementless patches.
- Strip of cured back tube gum 2 by 8 inches.
- Tube of cement 2½ by ½-inch diameter, or equivalent.
- Piece of sandpaper 2 by 8 inches, or equivalent.
- Two valve insides, Schrader's 1801 (GS 1082X1), or approved equivalent.
- Two valve caps, Schrader's 880 (GS 1081X1), or approved equivalent.

Carton to be labeled as follows:

WAR DEPARTMENT STANDARD INNER TUBE REPAIR KIT.

Directions.

For Temporary Tube Repairs.

For repairing small punctures use "Cementless Patches." Roughen the tube with sandpaper, then apply cement and allow to dry. Remove cloth from patch and apply. Tube can be used at once.

For repairing blowouts use combination repair stock. Roughen tube around cut with sandpaper, then apply coat of cement around cut inside and outside of tube. Allow to dry. Cut piece combination stock ¾-inch larger in all dimensions than cut and place inside of tube, bringing edges of cut together over center of stock. Apply another coat of cement outside of tube and allow to dry. Cut and place same size piece of combination stock on outside of tube over center of blow-out. Tube can be used immediately.

Note: Always remove cloth from patch and combination stock before applying and place cloth side next to tube.

REPAIR MATERIAL FOR PNEUMATIC TIRES.

See General Specifications for Tires[1], which are a part hereof.

GS 1091.

FABRICS (ONLY FOUR TYPES NECESSARY).

GS 1091X1.

Square-Woven Building Fabric: This fabric shall be 17¼ ounces per square yard with an allowable variation of 3 per cent plus or minus. It shall be 23 by 23 weave. The fabric shall be made from long-staple cotton with a tensile strength for each warp and filling of at least 150 pounds per inch. Methods of testing to be the same as specified in the fabric casing specifications. The fabric shall be frictioned both sides and skim-coated one side to a minimum gage of 0.047-inch.

GS 1091X2.

Cord Builder Fabric: This fabric shall be made from long-staple carded Egyptian or combed peeler cotton, or their physical equivalent, as approved by the Government, weighing not less than 13 nor more than 16 ounces per square yard. The cord fabric shall be frictioned or spread both sides and skim-coated equally on both sides to a gage of 0.050-inch.

GS 1091X3.

Bead Fabric, Square Woven.—This fabric shall weigh at least 8 ounces per square yard. It shall be made from long-staple cotton and shall be frictioned both sides.

GS 1091X4.

Breaker Fabric.—This breaker shall be an open-weave fabric of at least 10 ounces per square yard. It shall be made from long-staple cotton. It shall be frictioned or spread and also skim-coated equally on both sides. The minimum gage shall be 0.070-inch.

[1]The General Specifications referred to in these specifications were published on page 351, in The India Rubber World, March 1, 1920.

GS 1092.

COMPOUNDS (ONLY THREE STOCKS NECESSARY).

GS 1092X1.

Friction, Seam, Cushion, and Tube Repair Stock: (*a*) Specific gravity not to be over 1.30. These shall be made from and have the characteristics of a compound containing at least 65 per cent by volume of new rubber.

(*b*) Two tread stocks shall be used. There shall be a black stock of specific gravity not over 1.60 and a white or grey stock of specific gravity not over 1.90. The treads shall be made from and have the characteristics of a compound containing at least 50 per cent by volume of new rubber. The kind and quality of the reclaimed rubber must be declared when used. The tensile strength of a properly cured tread sample shall be 2,000 pounds per square inch, with a minimum elongation of 400 per cent (2 to 10 inches). The permanent set shall not exceed 30 per cent after an elongation of 350 per cent (2 to 9 inches).

(*c*) Side wall stocks. Use tread stock.

(*d*) Retread semi-cured bands. Use repair tread stock specifications.

(*e*) Cured-back tube stock. The uncured stocks used must fill the specifications for the friction coat and cushion stocks.

The gage of the raw gum shall be not less than 0.015.

The gage of the cured gum shall be not less than 0.032.

GS 1093.

CEMENTS (TWO CEMENTS ONLY).

GS 1093X1.

(*a*) Vulcanizing cement shall be made from a compound having a maximum specific gravity of 1.15 containing at least 75 per cent by volume of new rubber. It shall be dissolved in benzol. The rubber compound content by weight to be determined by evaporation and milled to constant weight, shall be not less than 17 per cent of the total weight of the cement.

GS 1093X2.

(*b*) Acid cure cement: This cement to be made from new rubber with no other ingredients than a benzol solvent. The pure rubber content weight to be determined by evaporation and milled to a constant weight, shall be not less than 6 per cent of the total weight of the cement. The acid solution used with this cement shall be 2 per cent monochloride of sulphur and 98 per cent benzol.

CURE.

The base cure on a 4-inch section for repair material should be based on 45 minutes at 50 pounds steam pressure, it being understood that cure is to be made under proper conditions.

VALVE BASES.

GS 1094.

Two sizes designated as large and small will be required. The standard commercial, after sample bases have been submitted to and approved by the Government, will be accepted.

AIR BAGS.

GS 1095.

The air bags shall be made according to the standard practice and design of the manufacturer. A sample section of the bag showing the end reinforcement and cross section of the bag must be submitted to the Government for approval. Bags must be tested with 100 pounds air pressure and show no leaks when immersed in water.

PRICES.

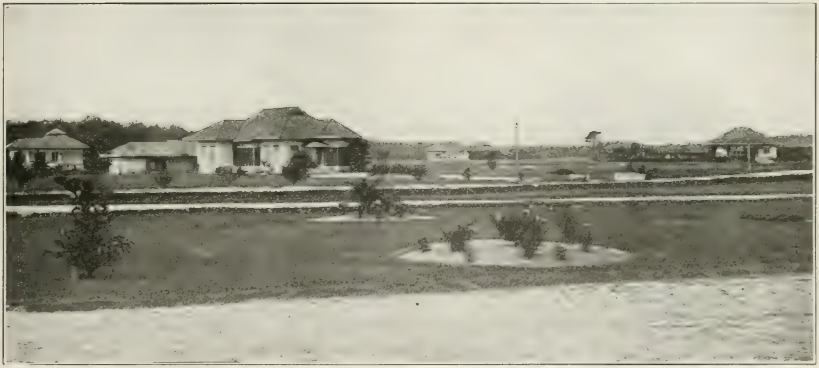
Repair materials will be purchased on a pound basis. For comparison of different quotations the specific gravity and price on the basis of volume must be submitted by the bidder in addition to the price on a weight basis, it being understood that the volume price shall be the price per square yard of the gage specified in the request for bid.

The Langen (Java) Rubber Estates Co., Limited, reports that of its 4,427 acres, 2,377 are planted with *Hevea* rubber and of these 1,979 acres are being tapped. The rubber yield for the fiscal year, closing with the end of August, 1919, was 700,222; the average net sale price was 1*s.* 9.1*d.* per pound, the cos of production, f. o. b. at port of shipment was 11.43*d.* per pound The estimated crop for 1919-1920 is 850,000 pounds. The ne profits were £28,297.

Life on a Sumatra Rubber Plantation.

The fascination which the strange lands of the Far East have held for the average American is taking on a more tangible form, now that travel and business are bringing Asia and the United States into closer contact. No article of commerce is doing more to bring this country into close touch with the mystic East than rubber. The rapid rise of the islands of the Indian Ocean to supremacy in crude rubber production, combined with the fact that America consumes nearly three-quarters of all the rubber grown there, has given many Americans an opportunity to look behind the scenes and become acquainted with the lands and peoples of that distant quarter of the globe.

Although the whole equatorial belt in that section is dotted with rubber plantations, representing a capital investment of nearly half a billion dollars, the thoughts of Americans naturally center on Sumatra, where one of America's greatest corporations has established a plantation so vast in area and so highly developed that it stands out as the greatest single plantation in the world. This is the plantation of the United States Rubber Co., comprising seventy square miles of growing trees, an enterprise marked throughout by a magnitude and an efficiency worthy of the best American traditions.



(United States Rubber Co.)

One-Story Bungalows, Central Park, Boenet, Sumatra.

Many young Americans, alive with the spirit of adventure, have wondered what opportunities this plantation field might hold for a youth in search of opportunity. Inquiries of this sort are constantly being received by the plantation executives. To all such, the company invariably replies that without technical training in rubber chemistry, soil chemistry or horticulture, there is almost no chance of getting a foothold. One of the requirements is that a man going there must be prepared to settle down with the idea of making his permanent home there.

The executive and technical staffs of the plantation are made up largely of Americans and Europeans, therefore the following description of the conditions in Sumatra is interesting and timely.

The first thing that strikes the American making his first visit to Sumatra is the intense humidity. The temperature does not get as high there as it does on our hottest days here, but for several weeks the humidity seems very oppressive. After a time one gets used to that, so much so that a cool breeze is uncomfortable and causes more worry about the occasional cool spots in the weather than about the heat. The perspiration flows so freely that colds must be guarded against, and after any violent exercise a sweater should be put on to avoid taking cold.

The next thing that attracts the attention of the newcomer is the density of the vegetation. The forests in the United States have open spaces among the trees, but in Sumatra the trees are covered with parasites and vines forming a solid wall, while the ground is covered with a mass of undergrowth. This super-luxuriant vegetation is one of the chief foes of the rubber plantations, making constant weeding a necessity. On the other hand, the fertility of the soil and the hot, moist climate which produce the heavy vegetation, work wonders for the rubber trees.

The company has gone a long way to make the Americans and Europeans on its plantations comfortable. There is quite a little social life, centering in a club house. There are balls and entertainments, and occasionally there will be a visit from a traveling theatrical or concert troupe.

There are a number of large houses of comfortable proportions for company officials and their families, and many one-story bungalows. The houses have to be built with regard for the sun and rain. A large part of the home life is spent on the veranda, and this part of each house is usually large and commodious. Glass windows are unknown—each window is really a slatted shutter. Circulation of the air must be free at all times, as a room closed for a few minutes would become stifling.

Much of the pleasure in life in the East depends on the efficient management of the servants in one's employ. For this reason it is quite necessary to speak the Malay tongue. It is so easy to learn that anyone can get along well with it after a few weeks. But until it is acquired it is simpler to do some things yourself than to employ the sign language to order them done. When once the language is learned, life is worth living. A white man never carries a package or stoops to lift anything from the ground. When tennis is played there are always some boys about to pick up the balls.

The endeavor is to reproduce as nearly as possible the food

obtained at home. The native cooks get good results considering they don't have the American ingredients. But American women succeed admirably in adapting some of the tropical foods to the Yankee palate. The lack of raw vegetables is most felt. Because of the danger of diseases everything must be cooked.

It is necessary always to sleep in a bed protected by mosquito netting or in a room that is netted. The mosquitoes are countless and very troublesome. Of course, as in all tropical countries, the bugs of all sorts are numerous. One thing that always attracts the attention of newcomers is the little lizards that crawl on the walls and ceilings. They do no harm and one gets quickly used to them. The ladies take longer to get accustomed to them, however, than do the men.

(United States Rubber Co.)
The Kisaran Club House.

When a woman accompanies her husband to the plantations she finds it more difficult to enjoy life than does her husband. He has his business to attend to and that keeps his mind occupied. But with the plentitude of servants the wife finds herself relieved entirely of housework and of the care of her children, if she desires, and she must be a person of resource if she is going to be happy. The woman who desires to create interest for herself can busy herself in her vegetable and flower gardens, in studying native life and in such sports as golf and tennis.

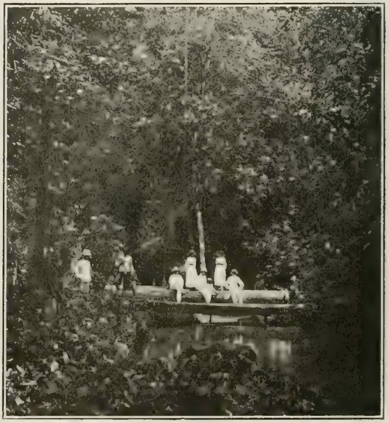
The servants are good and there are a lot of them. Each has his own work to do and does it, but he must not be asked to do anything out of his line. The cook is supposed to cook, and he feels badly treated if he is asked to do anything else. In a well-regulated home there are usually three to five servants.

(United States Rubber Co.)
Bungalows "America" and "Hollandia" on the Plateau.

The country is an ideal one in which to raise small children They live in the open until they are six or seven years old and miss most of the children's diseases common in the United States. The native nurses are faithful and efficient and the little tots live an outdoor life untouched by trouble. When they are six or seven years old, however, most of them are taken away to the temperate zone to get acquainted with their home lands and for the educational facilities those lands afford.

Members of the white staff in Sumatra are in a fortunate position in one especial particular in that a few hours' motor ride into the interior will take them up on the plateau. This plateau, deeply cut by ravines and surrounded by mountains, has an elevation of 4,300 feet. Some of the mountains are volcanoes which are somewhat active occasionally, giving off fumes. At Bras Tagi the company has some bungalows where can be found recreation and rest from the humidity of the plains. Up there the vegetation is quite different. Some varieties of temperate zone vegetables and flowers grow, notably potatoes. The temperature goes as low as sixty at night and no higher than eighty-five in the day.

Altogether the life on the plantations is quite pleasant after becoming acclimated. But always, down deep in every American's mind is the thought of home, and his eyes are always turning back across the ocean toward home. Most of the Europeans are Hollanders—Sumatra is a Dutch colony—and they seem to feel that in Sumatra they are on Dutch soil and consequently are more content than Americans to remain indefinitely on the island.



(United States Rubber Co.)
Serbangan Jungle Land.

Bolivia started public automobile lines last May, one from Sucre, the capital, to Cochabamba, another from Sucre to Potosi. Haiti, too, has established a postal automobile service between Port au Prince and Miragoane.

At St. Vincent the Sea Island cotton crop for 1918-19 amounted to 436,980 pounds or 1,214 bales, of which 682 bales were exported by the end of June. From Montserrat 222 bales of cotton were shipped, comprising 142 bales of clean cotton and 80 bales of stained.

Azteca, S. A., 29 Revillagigedo, Mexico, has appointed Severino Carrera Peña manager of the company, succeeding Ignacio Orozco, resigned. The officers are: Antonio Letayf, president; Rafael Orozco, treasurer; and Ricardo Ramos Barrera, secretary. The concern manufactures tires and rubber goods.

Colors and Pigments in Rubber Compounds.

By Calvin Stitt.

The use of pigments and colors in the manufacture of rubber goods is of extreme importance and it may be said that the employment of these materials is of more consequence now than ever before. To anyone who has had the opportunity to note the various compounds that are being used at different rubber factories and to see the unlike purposes for which in many cases the same material is used, the results obtained are remarkable.

Sometimes a chemist will find that a special pigment will work out nicely while another chemist will condemn its use. In the main, it will be found that most rubbermakers use formulas that are similar in many respects. I do not think they approach any more nearness than this, surely they are far from being identical. The cause lies mainly in the employment of the so-called human element. It naturally follows that no two products of two different rubber factories are the same, as long as they are made by different chemists who employ their own compounds. In this case I mean the finished product naturally is not identical, such as two tires.

By means of certain pigments it is found that the rubber is toughened. Some other fillers add elasticity, etc. In the case of an automobile tire it is essential to have toughness and a certain elasticity as well. The reason why some tires wear out quicker than others is not always due to the fabrication or the cure. It is often caused by the compound not being of the proper proportion or containing pigments that harm rather than benefit the rubber. This condition will prevail as long as the rubbermaker neglects to standardize his ingredients and be sure that his raw materials are always as near alike as it is possible for him to mke them.

The selection of colors is of paramount importance. We will disregard the aniline group and look into the pigments or dry colors, because these are the most used, except in the manufacture of balloons, toys and some rubber sundries and mechanical goods.

The blacks are usually a carbon black, lamp black or mineral black. In passing it may be well to note, that the advance in price on carbon black aside from war conditions, has been due largely to the enormous consumption by the rubber factories during the past four years.

It has not been found practical to use a cheap quality of carbon black, especially for tire treads and rubber sundries, but rather the higher grades. The higher percentage of black is more inert and is claimed to have no detrimental effects on the stock where used. A very small amount of strong carbon black will give a beautiful black color. Where an intense black is not desired the carbon black can be cut down considerably. Some chemists and experienced rubbermakers claim that this material adds strength and better wearing qualities to the rubber, while others claim it does not have this effect, and still others even go so far as to say that it is detrimental in some cases.

Perhaps the real truth may be that in one compound it works out very well while in another which contains other component parts and proportions, the result may be somewhat different. Carbon black may therefore be blamed for conditions for which its use is not responsible.

Lamp black is not as strong as carbon black and gives a bluish tone to the rubber. Some factories have a separate black room, and collect the dust by blowers, etc. Many rubber boot manufacturers use lamp black and find it very satisfactory. The mineral black pigments are not as strong as these other blacks. Some grades of mineral rubber are used in black stock also.

The reds are mostly the iron oxides, Indian red, antimony, vermilion red, Pará red and toloudine red. The toloudine red and Pará red are vivid shades, and are made from intermediates, and really belong to the aniline group.

English vermilion is a mercury product and is also very vivid. It is employed extensively in dental rubber goods. It is not necessarily made in England as some suppose. The name merely implies the English process of manufacture. There are to-day in this country several large makers of it and their product is very satisfactory.

Antimony, both crimson and golden, is used extensively in tube stock, sometimes in connection with red oxide and sometimes alone. It is also used in the treads, boots, heels, etc. The best antimony comes from England, but due to the difficulties experienced in importing it, there has been a large consumption of the domestic grades.

Red oxides are usually sold on their percentage of iron oxide content. The greater percentage the higher the cost. Some are natural or earth colors, while some are manufactured, especially the higher grades. These higher grades are made from copperas or the by-product of wire mills. This country produces some excellent red oxide, but previous to the war most of the higher grades were imported from England.

Indian red is very closely allied to red oxide, and is used principally on account of its large covering capacity, and also on account of its beautiful color, it being more of a maroon, or purplish shade. The higher qualities of Indian reds are of extremely fine mesh, free from grit. It is interesting to note that on account of its softness and freedom from coarse particles, Indian red of the best quality will not scratch the surface of highly polished gold. For this reason, it is used extensively in jewelry factories, and there are many tons sold throughout the country for this purpose.

The yellow colors, such as zinc yellow, chrome yellow, etc., as well as the blue shades, like Malori, Chinese and Prussian blues, also the ultramarine blue, are used in a limited way. To one who understands the various shades and combinations that can be obtained by various mixtures of colors, the results are very interesting to follow out. Each color has an effect upon the fillers and pigments that are in the compound and is itself affected by the pressure and heat applied in the vulcanization, so that one has to know pretty certainly what he is doing in order to be sure of getting what he started out for. Even the most particular and experienced sometimes go wrong. There are so many things that creep in before the product is finally finished, that it makes it very hard sometimes to check out results in advance.

The white pigments and fillers are by far the most important and most largely used. Zinc oxide is the principal one. Some time ago, the writer suggested that certain grades of leaded zinc could be used in some compounds. Experiments were made along this line, and to-day there are several rubber manufacturers who are using leaded zinc. They all turn out a highly satisfactory article and, moreover, are saving money on their zinc. It is not necessary to use a zinc that is free from lead or even approximately lead free in all rubber goods. As previously stated, some rubber manufacturers use zincs that contain lead, and find that the finished product is satisfactory. This is especially true when the goods are not required to be white. Zinc oxides that are free from lead are best for white rubber, such as sheetings, some grades of automobile tires and druggists' sundries. The writer has found that some brands of zinc oxide cover better than others. The chemist has found that it is profitable to experiment along this line, in order to determine the most suitable zinc oxide to use in his compound.

Lithopone is used considerably in rubber, but its use is not as great as zinc oxide. Many chemists do not recommend its use at all, while others do. It is composed of about 29½ per cent zinc sulphide and 69½ per cent barium sulphate. This is the reason it is generally sold as 30 per cent. There is a vast difference in the physical properties of this pigment. It possesses very great covering power, and has a beautiful white color. It also has a peculiar tendency to darken in the light, but will, however, regain its original color. There has been no one who could satisfactorily understand this phenomena, although many have tried and as many different theories have resulted. At any rate, no one can control this change in lithopone or remedy it.

Whiting or calcium carbonate is quite an important white filler. It is inert and unaffected by vulcanization. Several grades are employed, both imported and domestic. The imported is the cliffstone or English chalk whiting, which is produced from the great chalk cliffs of England. The domestic products are of various qualities, and different colors, ranging from a brownish or yellow gray to a beautiful white.

Barium sulphate or barytes is generally of a white water-floated grade, although large amounts of off color barytes are consumed. The artificial barium sulphate or blanc fixe is not used in any appreciable quantities.

Soapstone and talc are used in certain compounds and in dusting tubes, tires and rubber goods generally. It is essential to get a product that is not gritty. Color does not make much difference.

It is extremely necessary that the quality of many of the pigments and colors that are put into compounds of rubber should be of a standard or recognized merit. Some sad experiences have taught many rubber mills this lesson, and it is becoming more apparent than ever, especially in view of the fact that so many new rubber manufacturers are starting up in all parts of the country. It is not always convenient or practical for rubber firms to test out every ingredient that they employ, and for that reason it is a good policy to direct their purchases in a direction where their needs are understood, and where the possibility of error is minimized.

A NEW RAPID METHOD FOR THE DETERMINATION OF SULPHUR IN RUBBER COMPOUNDS.

By A. M. Munro M.A., A.I.C., F.C.S.

THE ANALYTICAL METHODS for determining sulphur in manufactured rubber, in use at the present time, fall under two heads: (1) those in which the finely divided sample is fused with a suitable nitrate fusion mixture or with caustic potash and sodium peroxide; (2) those where the rubber is decomposed with fuming nitric acid and the sulphur completely oxidized by final treatment either by a fusion process or by partial evaporation of the residue with potassium chlorate and hydrochloric acid. In both these cases the sulphur is finally determined by precipitation with barium chloride.

In this laboratory it has been customary to determine sulphur by boiling the sample of rubber, cut into small pieces, with fuming nitric acid, evaporating nearly to dryness, adding about half a gram of potassium chlorate and a few cubic centimeters of strong hydrochloric acid, and again evaporating. If the sample showed incomplete decomposition the above process was repeated. The mixture was then diluted with boiling water, filtered, and the sulphate in the filtrate determined in the usual way as barium sulphate. This method gives very accurate results, is more speedy than the fusion methods, and is free from the danger of loss by spurting; a disadvantage almost inseparable from the latter methods.

In seeking a still faster method than the above for the rapid assay of sulphur, the writer devised the following, and strongly recommends it as a routine method of analysis where extreme speed combined with accuracy is required. Many carefully timed tests have been made and it has been demonstrated that, with practice, the whole analysis from weighing the rubber sample to that of the precipitated barium sulphate can be carried out within one hour.

[1]Research chemist, Dunlop Rubber Company of Australasia, Limited.

DETAILS OF THE METHOD.

One to one and a half grams of the sample, cut into small pieces are placed in a large Erlenmeyer flask and covered with about ten cubic centimetres of strong nitric acid. This acid must be pure and free from traces of sulphuric acid. To this about five grams of sodium peroxide are cautiously added in small portions at a time. The reaction is often violent and the rubber commences to decompose, but no loss need be feared if the reaction is conducted in a large conical flask. The action is completed by gently warming the mixture on a sand bath.

After the first action is over and the rubber is more or less broken up, a process occupying a few minutes only, the mixture is boiled on the sand bath almost to dryness. Boiling water is added and the liquid filtered through a fast filter paper; the paper is washed twice with boiling water and the washings added to the filtrate. The sulphate in the filtrate is then precipitated in the usual way with a boiling solution of barium chloride, and, after standing for a few minutes, filtered through an ashless, fast filter paper, made to retain barytes. The precipitate is washed once by decantation and then on the paper until free from chloride. The paper and its contents are then removed from the filter, dried rapidly on a piece of wire gauze supported in the open over an asbestos mat heated by a Bunsen burner.

The precipitate is detached as completely as possible from the dry paper which is ignited separately. After the crucible has cooled the precipitate of barium sulphate is transferred to it and the crucible and its contents are again ignited at dull red heat. About five minutes' heating is sufficient to bring the precipitate to constant weight.

OBSERVATIONS.

The success and speed of the method outlined above depends on the fact that the combined action of the hot nitric acid and the hydrogen peroxide in the solution brings about a very rapid decomposition of the rubber and completely oxidizes the sulphur. It is probable, too, that nascent oxygen is present in the mixture and that this has a powerful action on the sulphur. Any loss of sulphur in the form of fumes of sulphuric acid during the final stages of the evaporation is prevented by the presence of sodium salts which convert all the acid into sodium sulphate. The use of a conical flask of large size precludes any loss due to spurting when the peroxide is added. In the precipitation, speed is attained by keeping all the solutions at boiling temperature and using fast filter papers, and considerable time is saved by drying the paper and precipitate as described on a wire gauze.

VELOSAN ACCELERATOR.

The English vulcanization accelerator Velosan is now available on the American market and is certain to elicit much interest since adequate supplies of the popular hexamethylene tetramine are not at present available. Velosan has been familiar for the past four years to the rubber manufacturers of England. It is non-poisonous, free of objectionable odors, generates no extra heat and cures goods in one-half to one-fifth of the usual time required.

The quantity of Velosan to be used is one per cent of the crude rubber weight in the mixing. It is added to the batch from a sprinkling can or in a mixture with three or four times its bulk of dry ingredients. Care is necessary to insure its uniform distribution throughout the batch.

What the Rubber Chemists Are Doing.

THE DETERMINATION OF CELLULOSE IN RUBBER GOODS.[1]

A PROPOSED METHOD for the determination of cellulose in rubber goods has been worked out by S. W. Epstein and R. L. Moore, assistant chemists of the Bureau of Standards. The authors find that the method usually employed for the determination of the rubber content of mixing by difference will give worthless results whenever there are present ingredients which are driven off in the ashing or are not included in the other determinations. Unless these ingredients are determined separately the figure for rubber hydrocarbonation is necessarily erroneous. Free carbon[2], glue[3], and cellulose are examples of such ingredients.

Rubber sheeting, raincoat materials, balloon fabrics, spread goods and frictioned fabrics are cited as rubber products which have cellulose impregnated with rubber in such a way that it cannot be separated from it. In addition there is the type of mixing which has fiber distributed throughout the compound, such as fiber soles, special light compounds, and special packings. In order to evaluate these products properly the fiber must be determined separately.

DETAILS OF METHOD.

After having considered the essentials of a procedure for the determination of cellulose in rubber goods, the following method was devised:

Digest 0.5-gr. sample of rubber in a 250-cc. assay flask with 25 cc. of freshly distilled cresol (boiling point 198 degrees C.) for four hours at 160-185 degrees C. The digestion can be carried out on an electric hot-plate or better still in a constant temperature oven. Allow the cresol to cool completely and add 200 cc. of petroleum ether (boiling point 45-50 degrees C.) very slowly and with constant agitation. After the solution has settled completely and the supernatant liquid is perfectly clear, filter through a Gooch crucible containing a fairly thick pad of acid treated and ignited asbestos, and wash three times with petroleum ether. Wash at least five times with hot benzene and then once or twice with acetone. Treat the contents of the flask with hot 10 per cent solution of hydrochloric acid and transfer the entire contents of the flask to the Gooch crucible with the aid of a "policeman." Care must be taken in adding the first portion of acid to the Gooch since in the presence of carbonates the effervescence which ensues may cause some of the material to be lost. It is best to add the acid a few drops at a time until there is no more effervescence. Continue to treat with hot ten per cent solution of hydrochloric acid until the pad has been washed to least ten times. Wash the pad free from chlorides with boiling water and run small portions of acetone through it until the filtrate comes through colorless. Treat with a mixture of equal parts of acetone and carbon bisulhpide until the solvent is no longer colored. Wash with alcohol and dry for one hour and thirty minutes at 105 degrees C. Remove the pad from the crucible with the help of a pair of sharp pointed tweezers and place it in a weighing bottle that is large enough to contain a 25-cc. Gooch crucible or the size crucible that is being used. Use the underneath portions of the pad as a swab to clean the sides of the crucible. If necessary moisten this asbestos with a little alcohol since this will facilitate the complete removal of material which sometimes adheres tenaciously. Place the weighing bottle and contents in the drying oven for about 15 minutes, cool and weigh. Call this weight *A*.

Transfer the contents of the weighing bottle to a 50-cc. beaker, taking precautions that no material is lost during the transfer or allowed to remain in the weighing bottle. Add 15 cc. of acetic anhydride and 0.5-cc. of concentrated sulphuric acid and allow to digest for 30 minutes at 75 degrees C. The steam bath can be conveniently used for this purpose. After the mixture has cooled completely dilute with 25 cc. of 90 per cent acetic acid and filter through a weighed Gooch containing a thick pad of properly prepared asbestos. To guard against traces of material being carried through it is absolutely essential that this filtration as well as the ones to follow be very slow and that only gentle suction be used. Wash with hot 90 per cent acetic acid until the filtrate comes through absolutely colorless and then wash at least four times more. Wash about five times with acetone. After having taken care that all of the material has been washed out of the beaker in which the acetylation took place, remove the crucible from the funnel, clean the outside thoroughly, place it inside of the same weighing bottle that was used to weigh the pad and dry for two hours at 140 degrees C. Cool and weigh. Call this weight *B*. Weight of Gooch crucible plus weight *A*, minus weight *B* equals loss due to acetylation or cellulose.

It is essential that all reagents given above be of chemically pure quality and be filtered before using.

When large numbers of determinations were carried out according to the above procedure, it was found practical to distil the filtrates and in this way recover a large part of the solvents used. The combined filtrates containing petroleum ether, benzene and cresol were distilled on the steam bath to recover the petroleum ether. The benzene was recovered as the temperature was raised. Finally the water condenser was replaced by an air condenser and the cresol distilled out at about 195-200 degrees C. This distillate was usually only slightly yellow.

Likewise the filtrates from the acetylation, which contain acetic anhydride, acetic acid and small quantities of sulphuric acid were collected and distilled. The distillate was collected between 105 and 115 degrees C. and was used for washing to take the place of the 90 per cent acetic acid called for in the proposed method.

RESULTS.

Results obtained by the analysis of a number of prepared stocks containing cellulose in the form of cotton fiber clearly indicated that by this method it is very easy to determine widely varying amounts of cotton fiber very accurately even when accompanied by a miscellaneous collection of mineral fillers in the rubber compound. Even in the presence of 15 per cent of carbon black it was possible to get good results on cellulose because the weighings were all made in weighing bottles and therefore no error was introduced by absorption of moisture by the large amount of carbon.

The presence of large quantities of cellulose in some reclaims necessitates looking for cellulose in finished rubber goods of grades in which reclaims may be expected.

The presence of considerable amounts of leather does not affect the determination of cellulose. In the cases of wood and jute, a comparatively accurate estimation of their quantity can be obtained by using a modified procedure, in which the temperature of 120 degrees is used in place of 185 degrees C. in order to dissolve the rubber.

CONCLUSIONS.

I. The method presented is readily applicable to the determination of fabric in rubber sheeting, raincoat materials, waterproofed fabrics, spread goods, frictioned and calendered fabrics in general. The results obtained by this method have been found

[1] "Determination of Cellulose in Rubber Goods," by S. W. Epstein and R. L. Moore. Technologic Paper No. 154, Bureau of Standards, Washington, D. C.

[2] "Determination of Free Carbon in Rubber Goods," by A. H. Smith and S. W. Epstein, THE INDIA RUBBER WORLD, January 1, 1919, page 197.

[3] "Detection and Determination of Glue in Rubber Goods," by S. W. Epstein and W. E. Lange, THE INDIA RUBBER WORLD, January 1, 1920, page 216.

to be accurate by analysis of known compounds. The method has been shown to be useful in the detection and determination of cellulose in reclaims.

II. The presence of leather in mixings does not interfere with determination of cellulose.

III. In the analysis of light, cheap compounds such as rubber soles where wood, jute, cork and leather may be present, it is desirable to digest sample at 120 degrees C. in cresol for 16 hours, in order to keep these fibers intact. Acetylation obtains 95 per cent of the total wood; 90 per cent of the total jute; 21 per cent of the total cork, and 70 per cent of the leather.

IV. The amount of cork present in a mixing can be approximated by removing unacetylated cork residue and considering this as 70 per cent of the total.

V. In the absence of jute, wood and cork, it is shown that the amount of leather may be estimated approximately.

VI. The problem of separately determining wood, jute and leather in a mixing has not been solved.

DETERMINATION OF NITROGEN IN CRUDE RUBBER.

The exact nature of the nitrogen compounds in crude rubber has not yet been determined, but the assumption that they may be converted into ammonia has been demonstrated by Howie who has adopted Wilfarth's modification of anhydrous copper sulphate to the Kjeldahl method.

It is generally considered that the final stage in the digestion with sulphuric acid is reached when the solution becomes clear. Actually it is necessary not that the solution be clear but to completely change the nitrogen compounds present into ammonia. Because of the large proportion of hydrocarbons in caoutchouc, at least six hours are necessary to produce a clear solution.

To determine if this period can be shortened and still have a complete change of the nitrogen to ammonia, the following experiments were carried out. In each instance one gram of caoutchouc was digested with 30 cc. of sulphuric acid, seven grams of potassium sulphate, and about one gram of anhydrous copper sulphate. Identical samples were heated, respectively, for one, two, three, four, five and six hours, after which the percentages of nitrogen were determined in the ordinary way. The sample heated for six hours was the only one clear, but was colored. The others all contained more or less carbon in suspension.

The analytic results showed that it is unnecessary, at least for caoutchouc, that a clear solution be obtained and that from three to four hours is ample for obtaining the total nitrogen present. (*"Le Caoutchouc et la Gutta Percha."*)

THE CONSTITUTION OF VULCANIZED RUBBER.

W. C. Schmitz summarizes as follows his investigations and contribution to the knowledge of the constitution of rubber by means of bromination, which appears in *"Gummi-Zeitung,"* volume 34, No. 10, page 193.

The impression that the bromine method would enlarge our insight into the problem of vulcanization has been confirmed to some extent and further results may be anticipated.

The author's investigation has shown that the bromine absorption is purely additive, there being no substitution. The reaction proceeds in two stages when continued for 18 to 20 hours, ten atmospheres of bromine being absorbed by the caoutchouc molecule in the first stage, two molecules of hydrogen bromide being afterwards liberated. The residue tetrabromide differs from the known caoutchouc tetrabromide by being insoluble in carbon tetrachloride. Full details of the method are given and the same reagent is being applied in the study of vulcanized rubber. The questions so far clearly defined in the latter connection are as follows:

1. Is vulcanization a purely additive combination of rubber with a sulphur combination?
2. Is the sulphur combination the result of substitution?
3. Is the purely colloidal explanation of the sulphur combination adequate, or are stoichiometric laws and colloidal factors involved?
4. Are the improved physical qualities of vulcanized rubber the result of pure chemical process?

SYNTHETIC RUBBER FROM PETROLEUM.

Synthetic rubber from petroleum, and the process for making it, as described in a treatise by Professor Ossian Aschan, of the University of Helsingfors, are discussed by Giuseppe Bruni, of the Pirelli laboratory at Milan, in a recent issue of the *"Giornale di Chimica Industriale."*

The Italian chemist concedes that the method may be employed with success for commercial quantities as well as in the laboratory. Though not wholly certain of this, he demonstrates that even with a material as common as Russian petroleum to draw upon, the cost of production would be prohibitive. It seems hopeless that synthetic rubber from any source can compete with natural rubber while the latter can be produced at a profit at the prices now prevailing.

ACTION OF PHENOL IN RECLAIMING.

André Dubosc, in *"Le Caoutchouc et la Gutta Percha,"* July 15, 1919, states that a better quality of reclaimed rubber is obtained by phenol than by the alkali process. The action is explained in two ways: (1) depolymerization of the rubber molecule; (2) formation of phonolic ethers or sulphides such as phenyl sulphide or thiophenol, the heat of the formation of which is greater than that of vulcanized rubber. Either water or alkaline solutions of phenol are used.

CHEMICAL PATENTS.

THE UNITED STATES.

FLEXIBLE HEAT-RESISTING COMPOSITION. An inflatable expansible core tube for use in the curing of sulphurized rubber tires is formed of rubber mixed with telurium or selenium which gives the material great durability when subjected to repeated heating. (H. E. Smith, United States patent No. 1,322,734.)

HEAT RESISTING PACKING consisting of vulcanized rubber compound having magnesite in a state of fine subdivision incorporated and distributed therein. (Julius Stromeyer, Philadelphia, Pennsylvania United States patent No. 1,330,148.)

PACKING. A molded and vulcanized piston packing ring comprising in its composition rubber, sulphur and ground sponge. (George Christensen, Jamaica, assignor to H. W. Johns-Manville Co., New York City, both in New York. United States patent No. 1,330,979.)

DOPE OR SUBSTITUTE FOR CELLULOID, VULCANITE, ETC. A plastic composition comprising a phenol-formaldehyde condensation product, camphene and a cellulose derivative. (William Thomas Robinson-Bindley, Wimbledon, and Arthur William Weller, both of London, England. United States patent No. 1,331,127.)

COMPOSITION FOR USE AS SUBSTITUTE FOR LEATHER. A dense non-elastic composition of matter comprising rubber, finely ground sponge and a considerable proportion of inert filler intimately mixed together. (George Christensen, Jamaica, N. Y., assignor to H. W. Johns-Manville Co., New York. United States patent No. 1,332,320.)

PROCESS FOR TREATING LATEX AND PRODUCT OBTAINED by coagulating rubber producing and similar latex, restraining the expansion of the latex during coagulation in the absence of applied fluid pressure, whereby the latex will be subjected to a gradually increasing pressure during its coagulation, and adding a vulcanizing agent thereto. (Edward Mark Slocum, Medan, Sumatra, Dutch East Indies, assignor to General Rubber Co., New York City. United States patent No. 1,332,925.)

Rubber Composition and Process for the Production thereof, comprising an admixture of a vulcanizable plastic and rubber seed pulp. (Edward Mark Slocum, Medan, Sumatra, Dutch East Indies, assignor to General Rubber Co., New York City. United States patent No 1,332,926.)

THE DOMINION OF CANADA.

Rubber Treating Process. Consisting in reducing waste vulcanized rubber to a finely divided state; adding a small quantity of new unvulcanized rubber in sufficiently dilute solution to produce a very thin film over the vulcanized ground waste; driving off the solvent and forming and vulcanizing the mixture in the usual manner. (The City Trust Co., assignee of Joseph Porzel, both of Buffalo, N. Y., U. S. A. Canadian patent No. 196,948.)

Waterproofing Composition Consisting of paraffine wax, dissolved rubber, a resinous substance dissolved in alcohol, a light hydrocarbon oil and carbon bisulphide. (The Gary Waterproofing Corp., Chicago, Illinois, assignee of Guy Madison Garlick, Kalamazoo, Michigan, U. S. A. Canadian patent No. 197,340.)

Waterproofing Process, which comprises heating a mixture of melted wax, resinous substance and dissolved rubber to 305 degrees F., and at varying specified suitable intermediate temperatures adding a resinous substance dissolved in alcohol, light hydrocarbon oil, and carbon bisulphide (The Gary Waterproofing Corp., Chicago, Illinois, assignee of Guy Madison Garlick, Kalamazoo, Michigan, both in U. S. A. Canadian patent No. 197,341.)

THE UNITED KINGDOM.

Leather Compositions for making boot soles, coating canvas for printers' blankets, upholstery, etc. The following proportions by weight may be used: 16 rubber, 20 leather flour, 5 calcined magnesia, 3 sulphur, 3 brown factice, or for a hard vulcanite material, 32 rubber, 60 leather flour, 16 sulphur and ½ magnesia. After mixing, the temperature of the rolls is raised to effect partial vulcanization and the material is finally passed to calender rolls prior to complete vulcanization in a platen press or an open live-steam press. (W. Drury, 10 Lena Gardens, Shepherds Bush, London. British patent No. 135,921.)

Vulcanizing Rubber. Nitrosobenzene or a similarly constituted nitroso-hydrocarbon of the cyclic series is used as an accelerator in the vulcanization of rubber. As an example, 100 parts of rubber are mixed with ten parts of sulphur and 0.5 parts of accelerator. (S. J. Peachey, 5 Yew Tree Road, Davenport, Stockport, England. British patent No. 136,716.)

Rubber Paving Slabs or Tiles are formed with a wearing surface of soft rubber composition and a foundation of hard rubber composition. The tiles may comprise a plurality of layers varying in hardness from top to bottom, and the bottom layers may be formed wholly or mainly from ground waste rubber. As an example the bottom layer may be formed from a mixture of five parts of ground rubber waste with two parts of sulphur, and the top layer of ground rubber alone. (Grimston Tyres, Limited, The Camp, St. Albans, Hertfordshire, and J. F. Cooper, Ivy Cottage, Port Vale, Hertford, both in England. British patent No. 137,117.)

THE FRENCH REPUBLIC.

Substitute for Rubber (V. A. Rosa (French patent 498,071.)

Process for Reclaiming Benzine or Other Solvents employed in the rubber industry. (Société Anonyme des Anciens Etablissements. J. B. Torrilhon. French patent No. 498,464.)

GERMANY.

Process for Regenerating Rubber Scrap. The material is heated with water under a pressure of 200—600 atmospheres at 210 degrees C., and in presence of alkaline substances such as caustic soda. Free and also combined sulphur as well as organic and inorganic filling materials are more completely removed than by existing processes, and the rubber is not affected. (W. North and H. Loosli, Hanover. German patent No. 313,554.)

Production of Highly Elastic Vulcanizates from Synthetic Rubber. Middle tar oil is incorporated with synthetic rubber prior to vulcanization, and imparts a high degree of elasticity to the final product. From three to five times the proportion of the customary "elasticators" is easily incorporated, the saturation limit being 150—200 per cent. (Mittledeutsche Gummiwarenfabrik. L. Peter, Frankfort. German patent No. 315,321.)

Process to Coagulate Rubber Latex. (Francis Alban Byrne, Birmingham, England. German patent No. 320,170.)

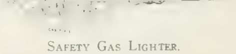
AUSTRALIA.

Caoutchouc. (E. Phillips, assignor to The Goodyear Tire & Rubber Co. Australian patent No. 8621.)

LABORATORY APPARATUS.

METALLIC SPARK SAFETY GAS LIGHTER.

The metallic spark gas lighter of the form common in domestic use is a decided convenience much appreciated in the laboratory where it will quickly light all kinds of gas, gasoline, acetylene and alcohol stoves, blow-torches, mantle burners, gas jets and solid alcohol stoves.

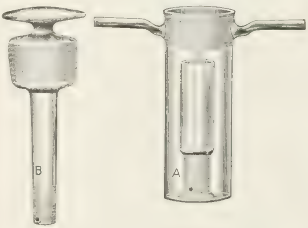


Safety Gas Lighter.

(National Liter Co., 702 East 63rd street, Chicago, Illinois.)

THE FISHER ABSORPTION BOTTLE.

A new form of absorption bottle described as "a V-tube passed through the fourth dimension," is here illustrated. This apparatus has the same absorption qualities as the U-tube. The principle of design is the same, but the arms, instead of being alongside of each other, are placed one inside of the other. This bottle is very desirable in any combustion work where dry reagents are used and has proved of particular value in rapid organic work. One turn shuts off inlet and outlet and also chamber A from B. It is easily charged and cleaned; is small, compact, light in weight, and stands solidly on the balance pan. (Eimer & Amend, 211 Third avenue, New York City.)



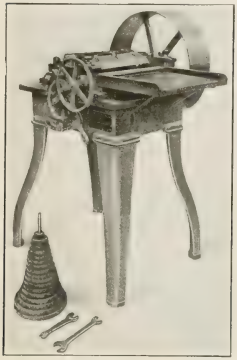
A Rapid Absorption Bottle.

The Bureau of Standards is engaged in the extensive project of developing standard specifications for all classes and types of rubber goods. Specifications for pneumatic tires and cotton jacket fire hose have already been submitted to the trade for suggestions. Work on surgical goods, tubing, rubber stoppers, etc., is under way.

New Machines and Appliances.

RUBBER BAND CUTTING MACHINE.

Just how many pounds of stationer's rubber bands are manufactured yearly in the United States is a matter for conjecture; however, the figures must certainly be in millions of pounds. A primary factor in the quantity production of this ubiquitous article is the band cutter shown in the accompanying illustration. It will cut bands in standard widths from 1/32-inch to 3 inches and in length up to 13 inches.


The Cruickshank Band Cutter.

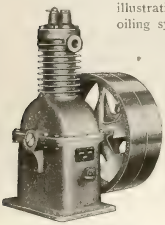
The operation is as follows: The circular strips or tubes are fed in the machine and over the apron, and are flattened out by a roller located just in front of the three revolving knives which come successively in contact with a stationary knife.

If short bands are required, as many as five or six strips may be run through at once, producing from 1,800 to 2,800 bands per minute. A set of change gears is provided for cutting bands of the various widths. The machine runs from 120 to 160 r. p. m. (Makers, The Cruickshank Engine Co., Providence Rhode Island. Selling agents, Birmingham Iron Foundry, Derby, Connecticut.)

THE CURTIS AIR COMPRESSOR.

It is an indisputable fact that oil is detrimental to pneumatic tires and tubes, but when necessary they are inflated wherever most convenient and without a thought of possible injury due to impure air.

The compressor shown in the accompanying illustration is provided with a special splash-oiling system that prevents oil from entering the cylinder, thereby avoiding the presence of oil in the air supplied to the tires.


Oil-Proof Tire Inflater.

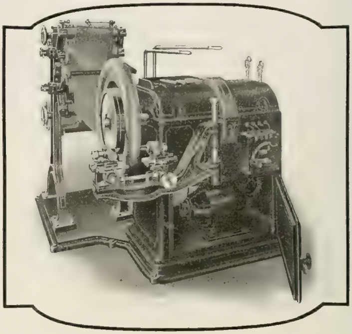
Other features are: high and low level oil-filling gages that indicate the amount of oil in the crank case; flywheel in fan for cooling the cylinder; inspectable valves; hand unloader facilitating starting compressor under tank pressure, and a head that is easily removed. (Curtis Pneumatic Machinery Co., 30 Church street, New York City.)

HERMAN TIRE-BUILDING MACHINES.

One of the salient features of these tire building machines is in the method employed in mechanically centering the fabric on the core while the carcass is being constructed.

By means of a novel centering device, all fabric leading from the rolls is not only automatically centered, but marked and guided into position without aid or assistance from the operator. This, together with improved tension rolls, gives perfect control and diminishes edge trim to a minimum.

This machine is manufactured in two models, the Special being designed and constructed for making Ford sizes only, while the two-unit or Universal will build any size and style up to and including five-inch. Due to the convenient arrangement of the tension rolls, two widths of fabric are always in position to the core on either machine, thus it will be seen that no movement is necessary on the Special, while on the Universal two automatic movements, in which no time is lost to the operator or builder, supply the necessary widths of fabric with which to construct the larger sized tires. (The Herman Tire Building Machine Co., Columbus, Ohio.)


Herman Special Tire Builder.

ELAPSED TIME RECORDER.

This device is a time meter or elapsed time recorder and by its use the necessity of subtracting the starting from the finishing time of jobs is entirely eliminated. One machine will compute and print elapsed time for any number of workmen who are engaged upon any number of jobs, irrespective of the order of starting and ending of the operations. It will also print the time of day a job is started and finished. These records may be made on cards or tickets of various sizes and shapes, which can be furnished by any printer.

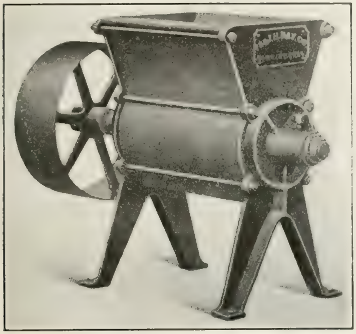

The Calculagraph.

One type of the machine prints elapsed time in hours and minutes, another type in hours and tenths of an hour and there are also different models for computing elapsed time for maximum periods of twelve, twenty-four, and sixty hours. (Calculagraph Co., 30 Church street, New York.)

MINERAL RUBBER CRACKER.

Mineral rubber has a wide range of usefulness in rubber manufacture and occupies an important place as a standard ingredient in rubber compounding. As this material is supplied by the makers in rather inconvenient form, the rubber manufactures find it necessary to "crack" it. This is effectively accomplished by passing the brittle mineral rubber through a crusher that reduces it to a size suitable for milling.

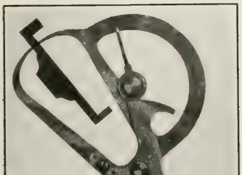
The machine shown in the accompanying illustration performs the operation of cracking in a satisfactory manner. It is provided with an ample hopper and with a discharge extending the full length of the bottom. The belt-driven crusher shaft is provided with heavy breaking lugs that pass between stationary lugs on each side of the cylinder. The machine is 33 inches high, 42 inches long and weighs 450 pounds. (The J. H. Day Co., Cincinnati, Ohio.)



Day Hercules Crusher.

INDICATING CALIPERS.

This useful hand-tool that is a modified outside caliper, comprises a rule, a magnifier and an indicator. It is supplied in two sizes, the 2-inch being graduated in 1/100 inches. Every tenth graduation is marked 10, 20, etc., to 100 and repeated to 200. The fifth intervening graduation is made longer to facilitate quick reading. The scale is three times actual measurement.



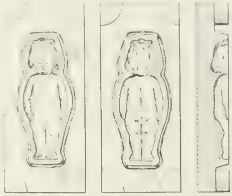
The 3-Inch Indicating Caliper.

The 3-inch indicating caliper is graduated in 1/64 inches. Every eighth graduation is marked 1, 2, 3, etc., to 8 and repeated to three inches. The fourth intervening line is made longer for easy reading. The distance between points on the dial is twice actual measurement. (Indicating Calipers Co., 506 East 19th street, New York City.)

MACHINERY PATENTS.

MOLD FOR MAKING RUBBER ARTICLES.

Molds made of cast iron with the mold surface machined according to the contour of the article are very expensive. So also, molds of white metal cast on a metal matrix involve large expense in making the matrix.

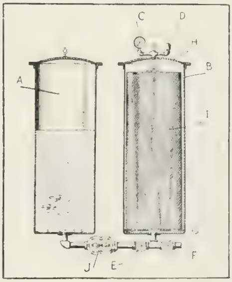


Aluminum Alloy Toy Mold.

A very satisfactory sand-cast mold for the manufacture of rubber articles may be made by employing an aluminum alloy which is free from ingredients which will unite with the sulphur compound in the rubber article. The alloy consists of approximately 97 per cent of aluminum and three per cent of magnesium and may be sand-cast with a smooth surface to be effectively used without machining. (Fred Thomas Roberts, Cleveland, Ohio, United States patent No. 1,329,312.)

PROCESS OF TREATING TIRE FABRIC.

The object of this invention is the introduction of a lubricant into pneumatic tire fabric, in the form of a suspension or emulsion in the yarn, threads or cords from which the fabric is woven, or into the woven fabric itself.



Tire Fabric Impregnator.

The form of apparatus used is shown in the illustration. It consists of twin cylinders, A containing the liquid lubricant and B, the impregnating cylinder, containing the fabric to be treated, wound on a series of parallel rods to admit the free contact of the emulsion or suspension with the inside of the roll. Mounted on the head is a gage C, to indicate the pressure on the inside of the cylinder, and an air-valve D, for the escape of the confined air.

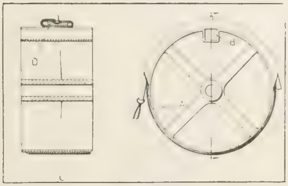
The cylindrical tanks are united by a pipe connection. A valve E, controls the flow of the lubricating solution. A steam pipe F, controlled by a valve G, connects the cylinder B, with a supply of steam.

In operation the valves E and G are closed, the detachable head H removed and the roll of fabric I placed in the cylinder. The head being secured in place, low-pressure steam is admitted to the cylinder through valve G. This heats the fabric, and drives out the air through valve D. Valve G is then closed and valve E is opened. Cold emulsion or suspension from tank A enters cylinder B and comes in contact with the hot water vapor. Condensation follows, automatically producing a vacuum which allows the emulsion or suspension to permeate the interstices of the fabric.

After this takes place atmospheric pressure is admitted to cylinder B and the surplus fluid pumped back into the tank A through the pump J. The fabric is then removed and thoroughly dried, leaving the lubricant in intimate contact with the fibers. (William C. Carter, Radnor, Ohio, assignor to The Goodyear Tire & Rubber Co., Akron, Ohio. United States patent No. 1,327,904.)

METHOD AND APPARATUS FOR MAKING BICYCLE TIRES.

The object of the improvement of the means and method for forming pneumatic tires, particularly single tube bicycle tires, is the elimination of sharp bends in the fabric at the point where it passes over the valve cot and the perfection of the adhesion between the head of the valve cot and the material forming the tire. The tire is built upon the drum A which has a diameter substantially equal to the inner diameter of the tire to be produced, and having an axial slot B adapted to give clearance for the valve cot. The tire forming materials of rubberized fabric and uncured rubber C are laid circumferentially on the drum and folded into tubular form over a spacing strap D provided with a handle for convenience.



Bicycle Tire Machine

As the layers are folded, the material is tightly sealed with a hand tool and the strap drawn along. The last few inches of the circumference of the tire is folded without the spacing strap and pressed without backing.

A spheroidal depression is provided in the strap, into which the head of the valve cot and the fabric covering it may sink. This permits any desired amount of pressure being exerted by the hand tool around the valve cot without danger of bending the fabric layers at this point and ensures more perfect adhesion between valve cot and fabric. (Joseph A. Bowerman, assignor to The Fisk Rubber Co.—both of Chicopee Falls, Massachusetts. United States patent No. 1,327,802.)

OTHER MACHINERY PATENTS.

THE UNITED STATES.

No. 1,329,849. Tire-trimming table. L. B. Pierson, assignor to The Fisk Rubber Co.—both of Chicopee Falls, Mass.

1,330,383. Machine for trimming rubber hose. F. C. Moore, Canton, O.

1,330,595. Apparatus and method for removing toy balloons from forms, etc. W. G. Lerch, assignor to The Miller Rubber Co.—both of Akron, O.

1,330,785. Mandrel for tire tubes. D. A. Clark and C. E. Lowe, assignors to The Republic Tool and Manufacturing Co.—all of Cleveland, O.

1,330,886. Apparatus for applying hard rubber to tire foundation bands. C. Macbeth and E. Sullivan, Birmingham, assignors to The Dunlop Rubber Co., Limited, Westminster, London—both in England.

1,330,958. Tire-retreading form and method of construction. W. J. Shriver, Milwaukee, Wis., and C. K. Heasley, Chicago, Ill.

1,330,976. Apparatus for forming composite bodies of rubber and fibrous material. H. L. Boyer, assignor to Joseph Stokes Rubber Co.—both of Trenton, N. J.

1,331,146. Tire mold. E. W. Fothergill, assignor to Hartford Rubber Works Co.—both of Hartford, Conn.

1,331,242. Tire-building machine. J. J. Convery, New York City, assignor to Kelly-Springfield Tire Co., Akron, O.

1,331,657. Machine for making pneumatic-tire covers, etc. C. Macbeth and C. K. Jones, Birmingham, assignors to The Dunlop Rubber Co., Limited, Westminster, London—both in England.

1,331,982. Vulcanizer. P. Deutscher, Indianapolis, Ind.

1,332,109. Tire-making machine. J. J. Convery, New York City, assignor to Kelly-Springfield Tire Co., Akron, O.

1,332,329. Stock shell for winding tire fabrics. W. F. Gammeter, Cadiz, O.

1,332,330. Tire machine drum. W. F. Gammeter, Cadiz, O.

1,332,608. Tire-building machine. J. J. Convery, New York City, assignor to Kelly-Springfield Tire Co., Akron, O. (Application divided.)

1,332,779. Apparatus and method for forming inner tubes for pneumatic tires. W. C. Tyler, Racine, Wis., assignor to The Goodyear Tire & Rubber Co., Akron, O.

1,332,812. Apparatus and method for removing tires from cores. R. B. Day, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

1,332,963. Press for molding plastic articles. A. Y. Tucker, Mount Vernon, N. Y., and J. E. Congdon, Passaic, N. J., assignors to the New York Belting & Packing Co., New York City. (Continuation of application Serial No. 152,170, filed March 3, 1917.)

1,332,990. Tire-bead-cutting apparatus. G. McNeill, assignor to Morgan & Wright—both of Detroit, Mich.

1,333,047. Die for making pneumatic tire treads. E. D. Valentine, Springfield, O.

1,333,062. Vulcanizer for rebuilding tires. W. B. Coats, Faribault, Minn.

1,333,150. Tire-building buck. H. F. Bartlett, Muskegon, Mich.

THE DOMINION OF CANADA.

197,358. Machine for manufacturing tire treads. G. A. Hagstrom, Kansas City, and I. S. Snyder, Rosedale, assignee of ½ interest—both in Kansas, U. S. A.

197,390. Tire vulcanizing apparatus. E. Hopkinson, New York City, U. S. A.

197,391. Apparatus for manufacturing pneumatic tires. E. Hopkinson, New York City, U. S. A.

197,493. Apparatus for manufacturing tires. E. Hopkinson, New York City, U. S. A.

THE UNITED KINGDOM.

136,236. Device for forming circumferential ribs on rods, cords, tubes, etc., of rubber as they are formed on an extruding machine. A. Abernathy, 19 Greyhound Lane, Streatham, London.

136,301. Apparatus for molding tires. A. A. Thornton, 8 Quality Court, Chancery Lane, London. (J. L. G. Dykes, 52 East 11th street, Chicago, Ill., U. S. A.)

136,888. Tire mold. A. A. Thornton, 8 Quality Court, Chancery Lane, London. (J. L. G. Dykes, 52 East 11th street, Chicago, Ill., U. S. A.)

136,889. Machine for making tire covers. A. A. Thornton, 8 Quality Court, Chancery Lane, London. (J. L. G. Dykes, 52 East 11th street, Chicago, Ill., U. S. A.)

136,890. Machine for stretching, shaping, and vulcanizing tire bands. A. A. Thornton, 8 Quality Court, Chancery Lane, London. (J. L. G. Dykes, 52 East 11th street, Chicago, Ill., U. S. A.)

THE FRENCH REPUBLIC.

496,611. Autoclave vulcanizer and dry oven combined. O. A. J. B. Greuet, 4 rue Meugnier, Maisons-Laffitte.

497,068. Machine to exhaust the air chambers of pneumatic tires. A. Schrader's Son, Inc.

497,641. Improvements in machines for calendering bases or bands of vulcanite for solid rubber tires. The Dunlop Rubber Co., Limited.

497,693. Apparatus for extracting oil from rubber and other substances contained in compounds soluable in organic solvents. Fisher Chemical Engineering Co., Limited.

498,012. (July 10, 1918.) Apparatus for a machine with extensible core that can be regulated, for baking pneumatic tires. Société Arnaud Soly et Cie.

498,594. Improvements in machinery for constructing the coverings of pneumatic tires. The Dunlop Rubber Co., Limited.

499,193. Machine for constructing tires. The Goodyear Tire & Rubber Co.

AUSTRALIA.

8,951. Vulcanizer. W. Reilly.

GERMANY.

320,335. Apparatus to evaporate wood acids and similar fumigatories in handling rubber latex or coagulated crude rubber. F. A. Byrne, Birmingham, England.

320,336. Mixing mill for rubber and similar substances. Société A. Oliver et Cie., Clermont-Ferrand, France.

320,337. Machine to mold pneumatic tire covers. F. H. Mercer, H. F. H. Blease and the Avon India Rubber Co., Limited, Melksham, England.

320,338. Machine to mold the covers of pneumatic tires. F. H. Mercer, H. F. H. Blease, and the Avon India Rubber Co., Limited, Melksham, England.

PROCESS PATENTS.

THE UNITED STATES.

No. 1,329,524. Molding openings for cork inserts in rubber heels. R. I. Hill, assignor to The Hill Rubber Co.—both of Elyria, O.

1,329,630. Insulating wire. J. J. Reinhold, Marietta, Pa.

1,330,791. Producing rubber grips for metal tool handles. C. T. Dickey, Elizabeth, assignor to J. J. Voorhees, Jr., Jersey City—both in New Jersey.

1,330,855. Repairing pneumatic tire covers. F. W. Farr, Northampton, Eng.

1,332,169. Manufacture of rubber-type stamps. J. Ellis, assignor to Featheredge Rubber Co.—both of Chicago, Ill.

1,332,847. Shaping vulcanized rubber heels. W. J. Kent, Brooklyn, N. Y., assignor to Revere Rubber Co., Providence, R. I.

THE DOMINION OF CANADA.

197,521. Production of rubber soles by cutting blanks before vulcanizing. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of M. H. Clark, New York City, U. S. A.

197,552. Manufacture of sponge rubber inner tires encased in fabric. The Pan-American Rubber Co., Milwaukee, assignee of A. F. Mayer, Watertown—both in Wisconsin, U. S. A. (See The India Rubber World, March 1, 1920, page 366, for description of inner tire.)

THE UNITED KINGDOM.

136,881. Securing rotary rubber and other heels. W. Plowright, 18 Palmerston avenue, Whalley Range, Manchester.

THE FRENCH REPUBLIC.

498,085. Process for making hollow articles of rubber. The Aranar Co.

498,509. Improvements in constructing air chambers in pneumatic tires. The Dunlop Rubber Co., Limited.

AUSTRALIA.

8,346. Mounting tire covers. G. Vincent.

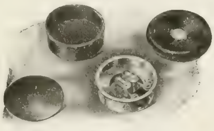
New Goods and Specialties.

WATCH-CASE TELEPHONE RECEIVER.

Watch-case telephone receivers encased in shells of hard rubber or of a composition to substitute hard rubber are a convenient development of telephonic accessories. The one shown here in the first illustration on the page is adapted to hang on the receiver-hook of any telephone. It is also used in the head-piece of the "National" radio receiver, in that case being pivoted for easy adjustment, without the hook for hanging.

Convenient Telephone Receiver

The working parts of the receiver are mounted in a metal cup independent of the shell, thus assuring greater mechanical strength and permanent adjustment. The second illustration shows the construction, detail *B* giving the assembly of the permanent magnets, coils, and terminal block in the cup. The diaphragm *A* rests on the rim of the cup *B* which is set inside the shell *C* and securely locked by the ear-piece *D*. Temperature thus cannot affect the adjustment. The magnets are laminated, semi-circular in form, and adapted for retaining their strength permanently. (The Holtzer-Cabot Electric Co., 115 Amory street, Roxbury, Mass.)



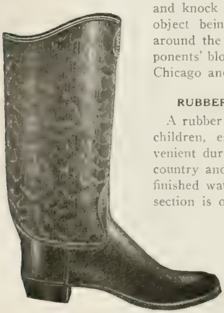
Receiver Parts—Detail.

BIFF, A NEW GAME.

The devising of a new game means more business for the sporting goods dealer who carries the ball or other articles used in playing it. "Biff" is a form of tether ball. An ordinary punching bag is tethered at the top of a four-foot standard which can be anchored on an ordinary table. The players stand at each end of the table and knock the ball back and forth, the object being to wrap the tether rope around the standard in spite of the opponents' blows. (Thos. E. Wilson & Co., Chicago and New York City.)

RUBBER BOOT WITH SILK TOP.

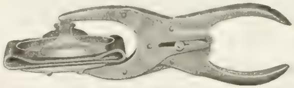
A rubber boot for wear by misses and children, especially practical and convenient during the spring thaws in both country and city, is made with a glossy finished watered silk top, while the foot section is of plain black varnished rubber. The entire boot is lined with black fleece lining to assure the wearer against coldness. The rubber part extends well up on the top at the back and front. The sole is of the knurled type to give secure footing, and there is a comfortable low heel. The sizes run as small as No. 4 for children. (The Kaufman Rubber Co., Limited, Kitchener, Ontario, Canada.)



"Life-Buoy" Rubber Boot

TIRE PATCH APPLIED WITH FUSE.

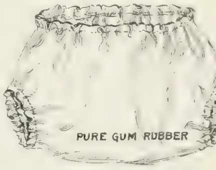
A device for applying patches to tires and tubes, rubber boots and shoes, hot-water bottles, hose, life preservers, or other articles made of rubber is called the "Tong-em-on" vulcanizer, and with this are provided a set of patches, two coppered pans (puncture and blow-out sizes), fuses, and a buffer. The method of application is to roughen thoroughly the surface of the article to be repaired, stick a patch to the bottom of copper pan, remove cloth, and clamp over hole. By sliding back the floating rivet in the slot the tong is kept closed. Two fuses are then put into the pan and lighted with a match. These furnish sufficient heat to cure the patch into place permanently. The article can then be used immediately. The "Tong-em-on" vulcanizer is nickel-plated. (Tong-em-on Vulcanizer Co., 626 Plymouth Building, Minneapolis, Minnesota.)



"Tong-em-on" Vulcanizer

"KEWPIE" BABY PANTS.

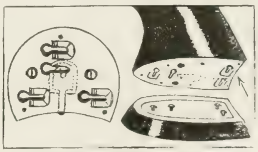
The use of rubber in the manufacture of articles intended for sanitary purposes has resulted in many practical adaptations which utilize both hard and soft rubber, rubber tubing, sheet rubber, etc. One of the later developments of sheet rubber is in the manufacture of baby pants. These are intended to slip on over the diaper and fit snugly enough to protect the clothing, yet are comfortable for the baby to wear. The style shown here is called the "Kewpie," and is patented. Shirring at the waist and leg openings is cemented to strips of rubber which permits the openings to stretch sufficiently for easy adjustment. The manufacturer also makes a full line of other rubber sanitary baby pants, aprons, sheetings, etc. (The Climax Specialty Co., 915 Pine street, St. Louis, Missouri; owner of trade mark, Maude Sinclair George.)



"Kewpie" Baby Pants.

INTERCHANGEABLE, DETACHABLE HEEL LIFTS.

A new development of the interchangeable, detachable rubber heel lift for both men's and women's shoes is shown in the accompanying illustration. The heel base remains at all times attached to the shoe and to this base is attached a metal plate in which are curved slots extending upward. The heel lift of rubber has an equal number of pegs extending beyond its inside surface to engage the slots in the heel base. After the heel lift is put into place and struck a sharp blow to drive it into alinement it is locked by a sliding key. The metal parts are of non-corrosive metal. This idea has also been adapted for women's French heels. (Maurice Mayorowitz, 720 East 9th street, New York City.)



Mayorowitz Patented Heel.

TIRE VALVE AND GAGE IN ONE.

A tire valve that combines with its primary function that of gaging the pressure of air in the tire is a convenience that most car owners will appreciate, as it does away with the bother of applying a separate gage to determine the amount of air pressure

Pulverman Tirometer Valve.

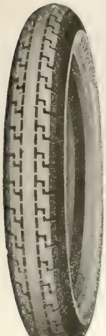
at any given moment. This device, called the Pulverman Tirometer valve, has a transparent dust cap, within which is positioned the gage so that it can be easily read without removing the cap. This valve can be substituted for the ordinary valve on any tire, as it fits any pneumatic tube. (Tirometer Valve Corporation of America, Charleston, West Virginia.)

"AIR-PEDS" FOR HEELS AND SOLES.

A new development of the rubber heel and sole is shown here in a set of three pieces of corrugated rubber, one to be attached to the heel and two to the sole of any shoe. The corrugations are so arranged that they minimize the liability to slip, according to the claim of the manufacturer, because in each piece the corrugations run in different directions. Because "Air-Peds" are in three pieces, they are not liable to draw the feet. They are attached in the same way as rubber heels but cannot crack or rip. These attachments are suitable for use by laborers, business men, sportsmen, golfers, etc. They may be had in either black or tan rubber. (Pioneer Products Co., 35 West 39th street, New York City.)

"Air-Peds."

A LATE CORD TIRE.



"Syra-Cord" Tire.

One of the newcomers in the cord tire world is pictured here. It is made by a comparatively new company that specializes in cord tires only and is produced by special machinery and processes. The "Syra-Cord" tire is notable for its Universal tread which is supposed to give a positive action against skidding as well as to possess the easy riding and steering qualities of the ribbed tread. (Syracuse Rubber Co., Inc., Syracuse, New York.)

"PORCUPINE" BLOW-OUT PATCH.

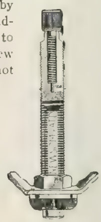
The "Porcupine" blow-out patch is so called because its outer surface is bristling with metallic quills which embed themselves in the inner side of the damaged tire, the points being driven in tighter with each revolution of the wheel. It is easily and quickly applied, even by those least experienced in tire repairing. (The Auto Boot Manufacturing Company of California, Los Angeles, California.)

NEW TIRE ACCESSORIES.

A new tire valve, called the "Newsom," is so constructed that it does not depend alone on the air pressure against the valve gasket to hold the air in the tube, but has an additional protection against the possible escape of air, in a cap nut which is screwed to the upper end of the stem and by which the valve gasket is drawn firmly against the valve seat at the base of the housing, thereby sealing the valve and holding at a constant standard pressure the air in the tube. The gasket at the base of the valve is of rubber. The tire is inflated by removing dust cap, unscrewing cap nut, and adjusting air hose in the usual way. In order to replace the cap nut, it is only necessary to screw it on tightly with the fingers. Pliers should not be employed for this purpose.

The "Snap-Lox" dust cap shown here gets its name from the ease with which it snaps on. It consists of two parts —the bushing and the cap. The cap proper has four slots at its base which allows it to be snapped over the upper end of the bushing. (Newsom Valve Co., 2714 Lasalle street, St. Louis, Missouri.)

"Snap-Lox" Dust Cap.



The "Newsom" Valve.

AN OFFICE AND HOUSEHOLD CONVENIENCE.

Every business office and household finds the rubber band a convenience or necessity. Neat boxes, with hinged covers, partitioned off to hold assorted sizes, sell at from 25 cents to $1 at retail. The bands are bright red, of good quality. (Eberhard Faber Rubber Co., Newark, New Jersey.)

ANOTHER SUPERSIZE CORD TIRE.

One of the newest supersize cord tires is the "Parker." It is built by hand of high-grade materials, carefully finished, and is distinguished by a white stripe running around the edge near the rim. The tread is a combination rib and non-skid, suited to both front and rear wheels. (The Parker Tire & Rubber Co., Indianapolis, Indiana.)

"Parker" Supersize Cord Tire.

Practical Advice to Repairmen.

By A. B. Zwebell.

In my last article[1] I related my experience of calling on some fifty-odd tire repairmen throughout the East, and I will now cover the high spots governing tire rebuilding, which should interest both the user of retreaders, as well as those contemplating going into this line of business.

Retreading is bound to be popular this year, and so long as tires are high in price, and there appears to be no reduction in cost of labor and material, and as worn treads represent only a fractional part of the actual tire—25 per cent to be exact, there remains 75 per cent of the actual tire to be used, which, after retreading will deliver from 2,500 to 5,000 miles service. An economical person would not throw away a perfectly good suit of clothes just because the lower edge of his trouser cuff was worn. He would have them repaired, because it represents only a fractional cost of the suit.

The tire manufacturer aims to build a balanced tire—one in which the tread is just thick and tough enough to last as long as the carcass. It would be poor business to follow another line, for if the tread was two inches thick (where one inch would suffice), a customer would naturally say the fabric was rotten if the tread was good and the fabric broken, or separated at the end of 5,000 miles. Reverse the situation; too much fabric is just as bad as not enough, for the tire could not perform the duty it was designed for, and instead of flexing it would be too stiff and eventually break down. Ask any tire manufacturer and he will tell you what has made the six-, seven- and eight-inch truck tire possible—cord construction, for one thing, and development. So you as a tire rebuilder, should be able to develop along the same line as the tire manufacturer, and soon be able to rebuild a tire giving 6,000 to 8,000 miles. What experience has done for the manufacturer it will do for you.

Data gathered from Texas to Canada and from New York to Seattle demonstrated that many combinations of repair material were being used. One repairman used one brand of cement, another brand of breaker fabric, another brand of cushion gum and still another brand of tread stock. This practice should be discouraged, for a manufacturer or jobber who sells you a cushion gum with a recommended cure of 50 pounds at 50 minutes, and a tread stock with a 50 pounds at 50 minutes cure is not giving you a combination that will make a successful retread. The cure recommendation no doubt was based on a flat pipe; in other words, when the uncured rubber comes in direct contact with the mold itself (rubber being a non-conductor of heat), the tread would be sufficiently cured, whereas the breaker fabric and cushion, not forgetting the cement, would be greatly undercured.

Retreading stocks are then not merely ordinary repair materials, but "specially compounded retreading stocks," designed, compounded and balanced. A retreaded tire requires a tread stock that is softer than the ordinary run of repair material. It resists road shocks and saves the carcass from bruising. It is important to use not too much or too little material; an extra ply of tread gum will not necessarily add a thousand miles of extra wear. It may decrease the wear of the tire even to a greater extent, for it will have a tendency to undercure the cushion and cement, which is a vital part of the entire job.

Don't use cheap repair materials and expect your retread to stand up. Tread stock that can ordinarily be purchased at 35 cents to 40 cents a pound will be expensive compared with tread stocks selling at 80 and 90 cents a pound. Comparing these stocks on a 34 by 4 carcass, the cost was found to be 35 cents more than when retreading with the 80- and 90-cent stock, but the results were worth the difference. Forget you are getting a bargain when a salesman offers you repair stocks at 35 cents a pound. Good crude rubber costs around 50 cents a pound, and when you buy retread stock make up your mind you are buying something else besides rubber. Analyze your own situation, cut off a pound of cheap gum, and a pound of high-grade stocks, compare the gage of the stock and figure the difference in yardage. Remember, rubber is one of the lightest ingredients going into the compound, and the lighter in weight per yard the higher the rubber content. Rubber stock has always been sold by the pound, but I contend it should be sold by the square yard or per tread of given dimensions.

The proper selection of a carcass is another vital matter, and while we can't look between the plys of fabric, we can avoid a lot of trouble by being careful, making a thorough examination and turning out a satisfactory job.

Start your work with a good foundation. Give the cement a clean new surface to cling to; remove the outside ply of fabric and you eliminate one of the worst enemies—dirt. Make up for the loss of the outside ply by vulcanizing a 3-ply liner inside, strengthening and building service into your tire. Vulcanize the liner in. Do not merely cement it in. By vulcanization it becomes a part of the tire, strengthening the weakness you overlook and cannot see.

Rebuild your tire. Do not simply retread it. When the tread is gone, your tire needs an overhauling and the cost of rebuilding is only a trifle more than retreading. Repairs should be made after the tread has been removed. Do not make a repair and retread at the same time. Your cure is not long enough to reach through to the inside of the tire. Make all repairs first and semi-cure, then rebuff the tire previous to cementing the carcass for the retread in the usual way.

Rim cuts can be successfully repaired, but judgment should be exercised by the repairman. A rim cut caused through accident, such as a bad bump or curb bruise, can be successfully repaired, for the chances are that the balance of the tire is in first-class condition. But a rim cut caused by a tire being run underflated is very much of a gamble to repair, for the chances are it is weak in another place and will soon blow out from the strains.

Resetting treads can be accomplished very successfully on the following occasions:

1. If the side walls of the carcass were oil-soaked and the rubber pulled off while being removed from the mold.

2. Where the carcass blew out at the bead after running a short distance.

3. When the fabric separated due to moisture.

To remove the tread, cut along the tread line with a knife around each side of the tire to the fabric. Pry loose with a prodding tool or screw driver and work a section loose. Then insert a broom handle and, with a little effort, time and patience this entire tread can be removed in one piece. An easier method is to cut across the tread and pull it off in the regular manner. The latter way is much easier, and the results are as good, the only difference being the fact that you have to resplice the tread, but this is an easy accomplishment.

In resetting a tread use one new ply of cushion gum only, as the breaker fabric will come off and adhere to the tread. It is advisable to let the cushion gum extend down the side of the tire one-half to three-quarters of an inch in order to piece in new strips of tread stock, trimming them off flush so as to make a neat job, otherwise there will be an offset. Don't over-

[1] "Practical Hints on Retreading," The India Rubber World, December 1, 1919, page 159.

look the resetting of the tread. Try it. If your first job does not make a creditable showing you will at least get the fundamental idea and your next attempt will surprise you.

A second curing operation is necessary, but this is the same as though you were curing up a freshly built carcass. A little caution should be used in seeing that the tread is laid straight and that you get the grooves of the tread in the grooves of the mold. Surprising results can be obtained with very little practice.

We learn a great deal from the other fellow, and here is a little "kink" I know will interest you. To follow the lines of least resistance is not always the best course to pursue, but in this case I am sure it is. The higher up you can cut off the old tread of a tire, the better the appearance of the finished tire. If you cut a tire down beyond the 45-degree you have to build it up with new stock costing money, and besides, you are apt to cause an overflow of stock if the sand bag does not fit snugly. To cut down the tire evenly all around saves time in rebuilding it, whereas, if you follow the line of the loose tread and sidewalls it is necessary to do a lot of piecing, which takes up time, and when the tire is finished you have the appearance of a patched-up job. The suggestion is to cut the tire evenly all around in the center of the 45-degree, if possible. If there are any loose particles of tread or side wall, lay them back, buff out the dirt, cement both the carcass and side walls, or even shoot in a small amount of cement with an oil gun. Then hang the tire so the cement will drain, place a piece of cushion gum between the carcass and the flap referred to, roll down the flap and you have effected a saving in labor, material and have an altogether better and neater looking job.

INTERESTING LETTERS FROM OUR READERS.

AS TO LABOR TROUBLES.

To the Editor:

Dear Sir:—No one has found a panacea for labor trouble, for one reason at least. The problem has not been approached in the proper spirit. It is hard to get away from the old attitude of capital towards labor, of patronage; "I've got the money, and you should be glad to get the work!"

There is little doubt that capital has, by and large, been unfair towards labor, and in some aspects has been guilty of down right stupidity. For example: capital would have nothing to do with so-called scientific methods forced to it by the exigencies of business, and then rushed into, and made a mess of time studies as demonstrated in the piece-work rates made therefrom. Capital, thereupon, in many instances, made another almost criminal blunder in cutting down the rate where workmen made more than, in the judgment of the employer, constituted a fair day's wage, whatever that may be.

This resulted, as was to be expected, in distrust, and resort to all sorts of underground methods to beat the game that capital itself had "called."

This has gone on for years during which it has been apparent that, instead of being a corking good team, capital and labor were pulling in opposite directions, with the result that nobody was getting anywhere.

In the meantime, labor found out there was money in nursing a grouch, and has been making an extensive and more or less successful use of it.

As capitalistic methods aroused the antagonism of labor, so now labor methods are arousing the resistance of the great, patient, somewhat stupid middle-class American, who, if he loves anything, loves a square deal.

That capital cares particularly for the "signs of the times," I very much doubt, but having come to a clear impasse, their good sense demands that they find a real solution for the problems that are in a fair way to confound them.

There are some aspects of the labor attitude that indicate that it is beginning to be obsessed with the idea that it can do about as it pleases. One weak spot in such an attitude lies in the fact that it drags in the innocent bystander who is put to all sorts of inconvenience and loss in a game in which he has not been asked to assist. He doesn't relish such a one-sided game, and so, has let out a series of yells and kicks that has attracted considerable attention.

The innocent bystander is insisting on a square deal all around, and will continue to make himself more and more disagreeable until somehow, sometime, somewhere, the matter will be thrashed out to the mutual advantage of all.

Everywhere in this country is heard the demand for production. Labor, as organized, is doing its best to prevent it, self-hypnotized with the notion that to concede this point makes for its best interests. It is hard to understand this point of view, and it will have to be educated out. This can be done by making it an inducement for labor to change its attitude and this attitude can be changed from hostility to one akin to loyalty, by proving to it that improved machinery and processes will make more goods, and that the greater the production, the fatter the pay envelope.

Efficiency.

GERMAN RUBBER TRADE CONDITIONS.

To The Editor:

Dear Sir:—It is with great pleasure that I comply with your request to inform you regarding the changes brought about by the world war. As it is the whole world over, wages have increased considerably in Germany compared with those paid in times of peace. The rate of wages is four and five times as high now and amounts at present to 4 marks per hour. We hope that rate will be stagnant for some weeks or about two months to come. After this time no doubt a further increase will take place.

As far as the attitude of the workmen is concerned, a marked improvement has come about. There was a decided aversion against work when the war was over and the revolution broke out and in many cases the workmen showed themselves refractory. Workmen's councils (like the shop stewards in England) were formed and acted as plenipotentiaries. Any wish of the workingmen gave rise to long discussions between the workmen's council and the management. All this was brought about by the long duration of the war and by the bad physical state of the people which was due to the insufficient supply of food. Irrespective of this there was a great lack of employment on account of changing the industry for peace work. From the moment that food was better obtainable, the workmen naturally began to show more interest in their occupation. Thus matters have considerably improved, although we are yet far away from the ante-war state. The general institution of the eight-hour day on the other side caused a decrease in production, especially as regards coal mining and agriculture. It, however, now begins to dawn that working hours must be increased, as otherwise there is no help for Germany, having had to fight for five years in the war and having lost it after all.

On the whole, at all events regarding the state of affairs in our district, I am glad to be able to say that everything goes comparatively well, especially as the influence of the radical elements, which never was great to any extent, is now waning away altogether. All other rubber factories in Germany are laboring under almost similar conditions, as much as I can say.

All we want is coal and raw material, and from the moment we could be supplied with these regularly, the works could be kept up running uninterruptedly.

You will perhaps be aware that now the workmen are represented by their voted members—instituted by law—and rather valuable concessions have been made with regard to their allowing them to look into the balance and to discuss in a somehow limited manner all questions regarding employment and discharge

of hands. Therefore all the revolutionary achievements are being guaranteed by law. These concessions, however, do not satisfy the radical elements who would prefer a state of affairs similar to that in Russia, but for which our present socialistic government so far has shown no inclination.

Willy Tichben.

Continental-Caoutchouc und Gutta-Percha Compagnie, Hannover, February 17, 1920.

NEW TRADE PUBLICATIONS.

A new rubber journal, "The Rubber Age," published monthly, has appeared in London. It has an attractive typographical dress, and handles the many sides of the rubber industry in Britain in an interesting manner. A glance at the future of the rubber industry makes an appropriate beginning.

The first number does not reveal the name of the editor, but mentions Herbert Standing, a rubber expert, as his assistant. The offices of the English "Rubber Age" are at 43 Essex Street, Strand, London, W. C. 2.

The rubber footwear catalog issued by the Kaufman Rubber Co., Kitchener, Ontario, Canada, shows that the special needs of the Far North and the wilds are well cared for, as well as the calls of civilization. Branches are established at Vancouver, Saskatoon, Calgary, Edmonton, Regina and Winnipeg, as well as in the older capitals of the Dominion, and pictures of the rubber boots for women, the heavy goods for fishermen, lumbermen, curlers, railroad men and pioneer farmers give some idea of how the requirements of the severe climate are met. Beside these are shown the rubber boots and shoes for city wear.

W. H. Salisbury & Co., Chicago, Illinois, one of the oldest rubber dealers in the world, dating from 1855, has issued an illustrated catalog of rubber goods and leather belting which gives some idea of the infinite variety of uses for india rubber. Every rubber article, from automobile tires, hose and belting to elastic bands and surgeons' finger cots and golf balls, is found in it. Tables of sizes and weights and power are given for every article, which are of permanent and general utility. It makes a handsome and artistic little book.

The Fujikura Densen Kabushiki Kaisha, the Fujikura Insulated Wire and Cable Co., Tokio, Japan, issues in English a handsome catalog of its electric wires and cables. The company was started in 1885 by Z. Fujikura and has been developed largely through the efforts of its present president, T. Matsumoto. The greater part of the pamphlet is given up to lists of standard sizes, but it contains also illustrated descriptions of the various forms of cables, with the catalog numbers and code names. It is a characteristically artistic product, as well as useful to all concerned with the wire business.

"Training for Foreign Trade," by R. S. Mac Elwee, F. G. Nichols, and collaborators, is issued by the Department of Commerce, Washington, D. C. (Paper, 9¼ by 5¾ inches, 196 pages.) This government publication is a triumph of methodology, the subject being neatly subdivided according to library bureau systems. Various courses are outlined in very full detail after the manner of business schools, equal stress being put on important and unimportant matters.

The commercial division of the world seems practical. There are elaborate and interesting syllabuses on Latin America and on the Near East, which means here the Ottoman Empire and the Balkan states, with lesser ones in Russia, the Far East, meaning China, Japan, the Philippines and the Dutch East Indies, and the study of modern languages. The last would have been improved if good dictionaries had been indicated with the other text books. The pamphlet should be useful in many ways.

A handsome illustrated folio pamphlet describes the "Advertising for 1920" of the Mohawk Rubber Co., Akron, Ohio. It shows the magazines and other publications used, the posters and sizes, the movie films and other forms of pictorial advertising and gives the text employed also.

An innovation in calendars is the [illegible] Miner's Catalogue and Calendar" for 1920, issued by the Miner Rubber Co., Limited, Montreal, Canada, which runs from March, 1920, to February, 1921. Behind the double calendar sheets are pages describing the goods made by the company illustrated in colors. These are indexed on the margin, a dozen being given up to boots and shoes, one to hats, capes, coats and aprons, and one to sizes of packing. As the headquarters are in Montreal, Canadian holidays are marked on the calendar.

"Recommended Specification for Basic Sulphate White Lead, Dry and Paste," prepared and recommended by the United States Interdepartmental Committee on Paint Specification Standardization, September 22, 1919; P. H. Walker, chairman; H. E. Smith, secretary. This pamphlet of eleven pages is Circular No. 85 of the Bureau of Standards. It covers sampling, laboratory examination of dry pigment and paste, and the preparation of the reagents required.

"Determination of Cellulose in Rubber Goods," by S. W. Epstein, and R. L. Moore. Technologic Paper No. 154 of the Bureau of Standards. Analytic method and results.

The *"Bulletin de la Société Belge d'Etudes Coloniales"* (Hayez, 112 rue de Louvain, Brussels), after a silence of four years on account of the war, came to life again in 1919, and naturally in the first numbers tried to tell the happenings of the war period. General Baron Bondy, the president of the society, himself writes the story of the fighting on the two German frontiers of Belgian Congo, while officials tell of the administrative and economic changes in the colony.

The General Tire & Rubber Co., Akron, Ohio, is conducting an advertising campaign with the tire slogan, "It goes a long way to make friends." A series of attractive posters with illustrations in black and white colors, reproduced from oil paintings by a famous artist, picture General tires making friends in many countries of the world.

THE EDITOR'S BOOK TABLE.

"TIME STUDIES AS A BASIS FOR RATE SETTING," BY DWIGHT V. Merrick. The Engineering Magazine Company, New York, 1919. (Leatherette, octavo, 5¼ by 9 inches, 366 + 18 pages.)

This is a technical manual of scientific time study based on the ideas of the late Dr. Frederick W. Taylor, and is an excellent example of the results in business training of the modern efficiency methods. The author first presents the principles, methods and implements of time study, then gives an example by applying his principles to a line of machine tools giving the detailed times as established by study, and finally, in a series of appendices, gives detailed times for a number of other kinds of work, thus demonstrating the adaptability of his principles and methods. The book has illustrations and many diagram tables.

HEATON'S ANNUAL, 1920. THE COMMERCIAL HANDBOOK OF Canada and Boards of Trade Register. Heaton's Agency, [illegible] street, Toronto, Ontario, Canada. (Cloth, duodecimo, [illegible] inches. 550 + 38 pages.)

Heaton's Annual, of Canada, is out for 1920, marking the sixteenth annual appearance of this extremely useful commercial handbook. The gazetteer of the towns of commercial importance in Canada is accompanied by maps. As usual, full information is given regarding customs and postal regulations; transportation facilities; financial institutions and methods; the resources, natural and industrial, of the various provinces; taxes, patents and other matters of importance. A directory of officials and Government departments, consuls and so forth is provided, with useful tables of weights, coins, interest and similar matters. It would be a convenience if Newfoundland could be included in the Annual, even if it is no part of the Dominion.

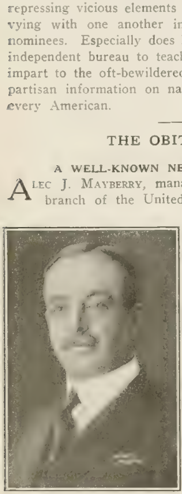
"For a Better America." By A. H. Alden. A Manual for the consideration of the American voter. Published by the author.

Emphasizing the truism that "Politics ought to be the most honorable business in the world," Mr. Alden, who is widely known and esteemed in the rubber trade, in a neat brochure, appeals to the American electorate to take a livelier, patriotic, and non-partisan interest in the selection of the men who make and administer the nation's laws. Appreciating the usefulness of political parties, he contends that they should be tolerated only as a means for obtaining better government and not for rewarding mercenary politicians or aiding selfish labor, capitalistic, or other classes. He would have independent voters so aggressively organized that they would indeed hold the balance of power, and the great parties would eagerly court their favor, not merely by repressing vicious elements within their own ranks but by even vying with one another in presenting capable and deserving nominees. Especially does he urge the foundation of a central, independent bureau to teach the science of government and to impart to the oft-bewildered citizen that complete, truthful, unpartisan information on national affairs which is the right of every American.

THE OBITUARY RECORD.

A WELL-KNOWN NEW ENGLAND RUBBER MAN.

Alec J. Mayberry, manager of the Boston, Massachusetts, branch of the United States Rubber Co., died suddenly of acute indigestion at his home in Allston, February 26, 1920, aged 49 years.



Alec J. Mayberry.

Mr. Mayberry was born in Bangor, Maine, May 22, 1870, and attended the grammar and high schools there. He became associated with the retail shoe business in Bangor, later accepting a position as traveling salesman for the Adams Dry Goods Co., resigning in 1897 to accept a similar position with Converse & Pike, traveling in Maine. With this firm and the Tremont Rubber Co. he remained until 1910, when he went to the Springfield Rubber Co., Springfield, Massachusetts, as president and treasurer. In 1916, he was made manager of the Boston branch of the United States Rubber Co., a position which he held until his death.

Mr. Mayberry's untimely death was a severe shock to his fellow employes who greatly liked and respected him. During his rubber career he had become known throughout the trade in New England and elsewhere. He was a member of the Boston City Club, the Shoe Trades Club, and various bodies of the Masonic fraternity. His wife died about two years ago, and surviving him are his mother, two sisters, Miss Carrie Mayberry and Mrs. Joseph Stewart, and also a brother, Herbert A. Mayberry. Mr. Mayberry also leaves a step-son, Stanley A. Bridges, of Winthrop, Massachusetts.

DIRECTOR OF A NEW AKRON RUBBER COMPANY.

Judge Dayton A. Doyle, a director of the recently organized Doyle Tire & Rubber Co., died February 28, 1920, in Akron, Ohio, from hardening of the arteries, aged 53.

It was as a lawyer and as one of Akron's most prominent lifelong-residents that Judge Doyle was best known. Born September 27, 1856, he was graduated from the Akron high school, Buchtel College and later from the Cincinnati Law School with degrees of A.B. and LL.D. He was admitted to the bar in 1882 and entered law business with ex-Senator Dick. The firm was known as Dick, Doyle and Bryan with offices in Akron and Washington, D. C.

He later served two terms as city solicitor, two terms as referee in bankruptcy and two terms as judge of the Summit County Common Pleas Court, his term expiring January 1, 1918, when he returned to private practice.

He is survived by his widow, three sons—Dayton A., Jr., Arthur W. and Frank W., and three daughters—Harriet E. and Ida Ruth Doyle and Mrs. Harold Belzell.

PRESIDENT OF A. SCHRADER'S SON, INC.

Dr. Charles K. Cole, president of A. Schrader's Son, Inc., Brooklyn, New York, manufacturer of pneumatic tire valves and accessories, died recently at Pasadena, California, aged 67.

Dr. Cole was born in Plainfield, Illinois, and began the practice of medicine in Helena, Montana, upon completing his education, and there also became prominent in public, business and social affairs, holding many positions of trust. Later, at the instance of his friend George H. F. Schrader, he established his permanent residence in New York City at Chelsea-on-the-Hudson and in 1914 became president of the Schrader company.

Dr. Cole was a member of the Rocky Mountain Club, Montana Club, Old Colony Club, Aero Club of America, and also held membership in several fraternal organizations including the Elks, F. and A. M., Odd Fellows, Knights of Pythias and Ancient Order of United Workmen. He is survived by his widow, Harriet Gillett Cole, a son, Dr. Philip Gillett Cole, and a daughter, Miss Alma Gillett Cole. Interment was at Maple Grove Cemetery, Brooklyn, New York.

SECRETARY OF A TRENTON RUBBER CO.

Horace M. Royal, secretary of the Home Rubber Co., Trenton, New Jersey, dropped dead on March 20, 1920, at his home in Morrisville, Pennsylvania. He had been in poor health for the past year and suffered from heart trouble. The death came as a great shock to the members of his family and his friends in the trade.

Mr. Royal, who recently removed from Trenton to Morrisville, was born in Germantown, Philadelphia, and after receiving his early education there, went to Trenton, where he secured employment with the Home Rubber Co. He was promoted at different times and from a minor position rose to the office of secretary. His amiable disposition won him many friends. He was a member of Column Lodge, Free and Accepted Masons, the Scottish Rite and the Shrine. He is survived by his widow and three sons, Joseph, Edward and Horace M. Royal, Jr.

A RUBBER MACHINERY ENGINEER.

Melvin B. Newcomb, aged thirty-one years, chief engineer of the rubber machinery department of the Wellman-Seaver-Morgan Co., died March 13, after a short illness at his home, Akron, Ohio.

Mr. Newcomb was born in 1889 in Bridgeton, New Jersey. He received his mechanical engineering education at the University of Wisconsin. He has been engaged in engineering work with the I. P. Morris Co., Philadelphia, Pennsylvania. The Allis-Chalmers Manufacturing Co., Milwaukee, Wisconsin; The Wisconsin Engine Co., Corlis, Wisconsin, and The Firestone Tire & Rubber Co., Akron, Ohio.

In January, 1918, he joined the hydraulic turbine engineering department of the Wellman-Seaver-Morgan Co., and a few months later he was appointed chief engineer of the rubber machinery department.

Mr. Newcomb was a member of the American Society of Mechanical Engineers, the Cleveland Engineering Society and the Akron Engineering Society. He leaves his widow and two young daughters.

MACHINE SHOP FOREMAN OF THE AMERICAN RUBBER CO.

Michael F. Murphy, foreman of the machine shop of the American Rubber Co., East Cambridge, Massachusetts, died January 4, 1920, at his home, 49 Thorndyke street, Brookline, aged 69 years.

Mr. Murphy was born in South Boston April 2, 1850, and his association with the rubber business began many years ago in the employ of the late Robert D. Evans. He went to the American Rubber Co. on March 26, 1886. He is survived by a widow and nine children.

A VETERAN EMPLOYE OF W. H. SALISBURY & CO.

Charles Frederick Luders, who was connected for over half a century with W. H. Salisbury & Co., Inc., of Chicago, the well-known distributer and manufacturer of rubber goods, died in Chicago January 31, 1920, of heart failure. Mr. Luders was born in Wismar, Germany, February 24, 1850, and had therefore nearly attained his seventieth year. He came to Chicago when six years of age and entered the service of W. H. Salisbury & Co. as errand boy in 1864. He worked his way up till he became general manager. Mr. Luders was obliged to retire some years ago as cataracts formed on both his eyes from which he could not obtain relief. He leaves his widow and three children, Fred, Etta and Elmer Luders.

CHARLES F. LUDERS.

MRS. FANNIE E. THOMAS, WIDOW OF THE LATE DAVID E. and mother of John W. Thomas, vice-president, and Edwin T. Thomas, Minneapolis manager of the Firestone Tire & Rubber Co., died in Tallmadge, Ohio, January 6, 1920, at the age of 75 years. She was born in Pembrokeshire in Wales, December 27. 1844, and in 1848 was brought to the United States by her parents who settled in Tallmadge. She was one of a family of eleven children and was the mother of eight, seven of whom survive her, two daughters and five sons.

SAMUEL KRAUS, VICE-PRESIDENT OF THE EAGLE PENCIL CO., NEW York City, died January 3, 1920, in his sixty-ninth year. He was connected with the pencil company and its predecessors from the time he was fourteen years of age, becoming in time superintendent and later vice-president in charge of the manufacturing departments.

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

(783.) A reader asks for the addresses of concerns which have to sell scrap rubber belting suitable for cutting into soles.

(784.) An inquiry has been received for the addresses of manufacturers of machinery for making bathing caps.

(785.) A correspondent requests the addresses of concerns manufacturing tire half-soles.

(786.) A reader desires the addresses of makers of embossed metal plates for branding tires.

(787.) Request is made for the addresses of manufacturers of flexible or semi-flexible rubber that will withstand repeated boiling in water and retain its vitality.

(788.) A manufacturer asks for the addresses of the concern making the Bragg or any other automatic rubber mixer.

(789.) A rubber manufacturer asks whether there is manufactured at the present time a mixing mill with a cover which will prevent carbon black from flying about in the mill-room; if so, the manufacturer's address is desired.

(790.) Request is made for the addresses of manufacturers of golf ball molds.

(791.) A correspondent desires to have rubber spraying bulbs made in thousand lots. He has the molds.

(792.) An inquiry has been received for the addresses of the manufacturer who can supply policemen's clubs made of rubber.

(793.) A correspondent asks for formulas for making rubber or vulcanite grinding wheels.

(794) Request is made for the addresses of manufacturers of forms for making toy balloons.

(795.) A reader asks for the percentage of antimony and tin melted together by the average hard-rubber manufacturer for casting molds for hard-rubber goods.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Requests for each address should be on a separate sheet, and state number.

DISTRICT OFFICES.

New York: 734 Customhouse.
Boston: 1801 Customhouse.
Chicago: 504 Federal Building.
St. Louis: 402 Third National Bank Building.
New Orleans: 1020 Hibernia Bank Building.
San Francisco: 307 Customhouse.
Seattle: 848 Henry Building.

COOPERATIVE OFFICES.

Cleveland: Chamber of Commerce.
Cincinnati: Chamber of Commerce; General Freight Agent, Southern Railway, 96 Ingalls Building.
Los Angeles: Chamber of Commerce.
Philadelphia: Chamber of Commerce.
Portland, Oregon: Chamber of Commerce.
Dayton, Ohio: Dayton Chamber of Commerce.

(32,060.) President of commercial organization in Bulgaria desires to secure an agency for rubber shoes. Correspondence may be in English.

(32,086.) A merchant in Italy desires to secure an agency for rubber articles, bandages, and tires for automobiles and bicycles. Quotations f. o. b. Italian port. Correspondence may be in English.

(32,111.) Firm in the Netherlands holding interests in rubber plantations desires to purchase and secure an agency for machinery and tools in general for Dutch East Indian rubber plantations. Quote c. i. f. Netherlands ports and f. o. b. San Francisco for Dutch East Indies. Payment against documents.

(32,138.) A mechanical engineer from Switzerland desires to secure an agency in that country for belting, automobiles and accessories and tires.

(32,146.) A company of electrical goods dealers in Czecho-Slovakia wishes to purchase and secure an agency for insulated wires, and rubber for technical purposes. Catalogs requested. Cash, United States currency. Correspondence in Czech or German.

(32,158.) A commercial chemist in England desires to secure an agency for medicated rubber adhesive plasters and similar articles of druggists' sundries.

(32,162.) Commercial agent in Italy wishes an agency for the sale of pneumatics and automobile and motorcycle accessories. Quote c.i.f. Geneva or Naples. Payment against documents. Correspondence may be in English.

(32,194.) Merchant in Belgium wishes to purchase or to secure an agency for the sale of men's india rubber collars. Correspondence and catalogs should be in French.

(32,262.) A manufacturer in South Africa desires to purchase waterproof canvas for coaches. Quote f.o.b. New York. Payment through bank against documents.

(32,274.) A company in Greece wishes to buy dental rubber. Correspondence in French or modern Greek.

(32,275.) Importer in Argentina desires agency for the sale of rubber goods, and oiled and waterproofed clothes. Correspondence may be in English.

(32,315.) Commercial agent in British West Africa desires to represent manufacturers in the sale of automobile tires.

(32,311.) Firms in Palestine and Egypt wish to secure agencies for the sale of rubber overshoes. Quote c.i.f. ports of Palestine.

(32,328.) Commission agent and wholesaler in Syria desires to communicate with exporters of rubber goods.

(32,331.) A firm in Norway desires to purchase rubber and rubber goods. Quote f.o.b. American port or c.i.f. Norwegian port. Payment through banks.

(32,349.) A firm of importers in Syria wishes to communicate with exporters of rubber shoes, rubber and rubber goods.

JUDICIAL DECISIONS.

TUFFORD HEEL PATENTS UPHELD.

Rubber heel makers and dealers have followed with exceptional interest the long struggle in many courts of the I. T. S. Rubber Co., Elyria, Ohio, to establish its sole right to manufacture and market the type of heel invented by John G. Tufford, of Elyria, the patents on which had been assigned to the I. T. S. company. Some of the largest concerns in the rubber trade were made defendants in the lawsuits begun by this company, and the alleged infringers were enjoined from further manufacture and sale of the heels said to be identical with those described in the Tufford letters patent.

Nine favorable decisions were obtained by the I. T. S. company, and one decision was adverse. The company took the latter to the United States Circuit Court of Appeals, and it reversed the unfavorable decision. Defendants in the litigation included the Panther Rubber Manufacturing Co., Boston, Massachusetts, the Fetzer & Spies Leather Co., of Cleveland, Ohio, the Elyria National Rubber Heel Co., Elyria, Ohio, the United States Rubber Co., New York City, H. H. Hackman & Co., Cleveland, Ohio, and the Consolidated Rubber Co. and the Hill Rubber Co., both of Elyria, Ohio.

The Elyria National Rubber Heel Co., after the United States District Court at Cleveland had enjoined it from manufacturing and had declared the Tufford patent valid and having been infringed, took the decision to the United States Circuit Court of Appeals for the Sixth Circuit and an early hearing is expected in that tribunal.

The Tufford patent on the heel is Reissue No. 14,049, and on the mold for making the heel No. 1,177,833, the latter having been granted April 4, 1916. The salient feature of the invention is the "curve," a concavity or part-spherical recess throughout the upper surface of the heel, which characteristic rival concerns are alleged to have duplicated.

Reference to this peculiarity of the heel is thus made in the Tufford patent grant: "When the heel or lift is placed against the flat under surface of a leather or other shoe heel and pressure applied to the resilient heel or lift, a vacuum or suction cup may be formed whereby the heel or lift will be held to the shoe temporarily until the nails can be applied. A further object of the invention is to produce a heel, which, when applied to the shoe, will have a flat tread surface and which may be equipped with fastening devices so located that the heel can be easily trimmed down to the required size."

I. T. S. Rubber Co. *vs.* Panther Rubber Manufacturing Co. —United States Circuit Court of Appeals, First Circuit. Decided May 29, 1919; rehearing denied, July 23, 1919. Appeal from the District Court of the United States for the District of Massachusetts in the matter of the Tufford patent No. 1,117,833 for making rubber heels.

The decision states distinctly that the device was not anticipated by the Nerger mold; that the claim for the particular structure and the method of applying it is valid and was infringed. The decision of the lower court overruled and appeal allowed. ("Federal Reporter," Volume 260, page 934; "The Official Gazette," United States Patent Office, February 17, 1920.)

United States Rubber Co. *vs.* I. T. S. Rubber Co.—United States Circuit Court of Appeals for the Sixth Circuit. Decided October 7, 1919. Appeal from a preliminary injunction granted by the District Court in the matter of the Tufford patent.

Decree affirmed with the statement that the infringement question is settled by the Fetzen & Spies Leather Co. decision, except as to one minor point, which is obscured by its wording. While the court does not believe that it makes any difference, it remits that point to the District Court for decision. ("Federal Reporter," Volume 260, page 947.)

Fetzer & Spies Leather Co., *vs.* I. T. S. Rubber Co.—United States Circuit Court of Appeals for the Sixth Circuit. Appeal from the District Court of the United States for the Eastern Division of the Northern District of Ohio in the matter of the Tufford patent for rubber heels, reissue No. 14,049. Decided October 7, 1919.

Decision states that the delay in applying for the reissue was reasonable; that the Tufford patent is valid as against both the Nerger and the Ferguson patents, not only because the Court of Appeals for the First District has so decided, but because the process is original as the Court demonstrates in detail. It also asserts that the real contestant is the Foster Rubber Co. Judgment of District Judge affirmed and appeal disallowed. ("Federal Reporter," Volume 260, page 939; "The Official Gazette," United States Patent Office, February 3, 1920.)

Munger *vs.* Firestone Tire & Rubber Co. }
Munger *vs.* The B. F. Goodrich Co. } United States Circuit Court of Appeals for the Second District. Decided November 12, 1919.

Decree of District Court, dismissing bills of discovery against the two companies, is affirmed. Louis De F. Munger, inventor of an improvement in pneumatic tires, after the expiration of his patent, brought suit against both companies for infringement, and asked in the bills of discovery that the companies should furnish him with detailed statements regarding their business and profits. The District judge refused to allow this until after the infringement suit had been tried and decided. ("Federal Reporter," Volume 261, page 921.)

MODIFICATIONS OF BRITISH PATENT LAWS.

The term for which British patents are valid is made by the new Patents Act, 16 years instead of 14, and the period within which complete specifications can be lodged and applications with provisional specifications can be filed is extended to nine months instead of six. A patentee who can show that he suffered loss or damage in regard to his patent on account of war conditions may obtain an extension of the time of his patent.

By the new act the patentee at any time after the patent is sealed, may request to have it endorsed with the words "License of Right." An inventor does not prejudice his right to apply for a patent by describing it before a learned society; he must give notice beforehand, however, and must apply for his patent within six months of the reading or the publication of his description.

Rubber enters into the making of many of the exhibits in the Toy Fair recently held at the Hotel Imperial in New York City. The United States Rubber Co. exhibited dolls and animals in red rubber as well as white, while rubber continues to be used as the motive power for toy airplanes and submarines, for stamps, for tires, and other parts of toys.

News of the American Rubber Trade.

DIVIDENDS.

The Brunswick-Balke-Collender Co., Chicago, Illinois, has declared its quarterly dividend of one and three-quarters per cent, payable April 1 on preferred stock of record March 30, 1920.

The Delion Tire & Rubber Co., Baltimore, Maryland, has declared its regular quarterly dividend of two per cent, payable April 1 on preferred stock of record March 20, 1920.

The Driver-Harris Co., Harrison, New Jersey, has declared its quarterly dividends of one and three-quarters per cent on preferred stock and of two per cent on common stock, for the period ended March 31, payable April 1 on stock of record March 21, 1920.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, has declared the following quarterly dividends: Initial, 75 cents per share, payable April 1 on common stock of record March 15, placing stock on twelve per cent rate on the $25 par value; one and three-quarters per cent, payable June 15 on second preferred stock of record May 31, 1920.

The General Electric Co., Schenectady, New York, has declared its quarterly dividend of $2 per share, payable April 15, on stock of record March 20, 1920.

The Hodgman Rubber Co., Tuckahoe, New York, declared a dividend of $1.13 per share, payable February 1 on preferred stock of record January 15, 1920. This stock was issued December 12, 1919.

The Kelly-Springfield Tire Co., New York City, has declared its quarterly dividend of $1.50, payable April 1, on six per cent preferred stock of record March 15, 1920.

The Keystone Tire & Rubber Co., Inc., New York City, has declared its regular quarterly dividend of three per cent, payable April 1, on common stock of record March 15, 1920.

The National Aniline & Chemical Co., New York City, has declared a quarterly dividend of one and three-quarters per cent for the period ended March 31, payable April 1 on preferred stock of record March 15, 1920.

The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio, has declared its quarterly dividend of 75 cents per share on outstanding no par common stock of record February 20, payable March 1, 1920.

The Pennsylvania Rubber Co., Jeannette, Pennsylvania, has declared its regular quarterly dividends of one and three-quarters per cent on preferred stock and one and one-half per cent on common stock of record March 15, both payable March 31, 1920.

The United Shoe Machinery Corp., Boston, Massachusetts, has declared the following dividends: One and one-half per cent on preferred capital stock and 50 cents per share on common capital stock, both payable April 5 on stock of record March 15, 1920.

NEW INCORPORATIONS.

A. & A. Raincoat Co., The, February 18, 1920 (Massachusetts), $25,000. Jacob, Charles and Philip Aronson—all of 24 Powellton Road, Dorchester, Massachusetts. Principal office, Boston, Massachusetts. To manufacture, purchase and sell at wholesale raincoats and all other goods of which rubberized cloth is a component part.

Ad-Mor-Myler Rubber Co., March 2, 1920 (Delaware), $1,000,000. M. L. Horty; M. C. Kelly; S. L. Mackey—all of Wilmington, Delaware. To manufacture rubber appliances.

Aetna Rubber Co., The, May 1, 1919 (Ohio) $20,000. T. Ferry, president: W. H. Staring, vice-president; A. J. Huston, vice-president; E. T. Slinkard, secretary and treasurer; G. R. McKay, director. Principal office, 811 East 79th street, Cleveland, Ohio. To manufacture high grade electricians' and acid gloves. (Reorganization.)

Associated Tire Stores Corp., January 29, 1920 (Delaware), $30,000,000. T. L. Croteau; M. A. Bruce; S. E. Dill—all of Wilmington, Delaware. To manufacture tires, etc.

Auto Outfitters, Inc., February 25, 1920 (New York), $10,000. D. D. Vogel, G. H. Howard, both of 1105 Bedford avenue, Brooklyn; A. Allenberg, 3 East 44th street, New York City—both in New York. Principal office, Brooklyn, New York. To manufacture tires.

Channel Packing & Rubber Co., Inc., February 26, 1920 (New York), $50,000. T. P. Hastings, 73 Pineapple street; A. M. Hardes, 13 St. Andrews street—both of Brooklyn; F. J. O'Conner, Hillburn—both in New York. To manufacture rubber goods, engineers' supplies, etc.

Eagle Tire Co., The, November 14, 1919 (Ohio), $25,000. P. W. Stanley, president; M. Winkler, vice-president; W. Werner, secretary and treasurer. Principal office, 806 Prospect Avenue East, Cleveland, Ohio. To manufacture tires and tubes.

Emery Tire & Rubber Co., January 17, 1920 (Washington), $60,000. W. A. Emery; C. C. Howell; H. Tarbox. Principal office, 104 23rd Avenue North, Seattle, Washington. To sell tires and automobile accessories.

Grayson Automotive Corp., March 9, 1920 (New York), $20,000. B. Levy; B. Swiryn; S. J. Grayson—all of 403 Amsterdam avenue, New York City. To manufacture automobile tires and accessories.

High Grade Garter Co., Inc., March 3, 1920 (New York), $5,000. H. Abrotsky, 382 Watkins street; R. Hammer, 338 Vermont street, both of Brooklyn; W. Jacobs, 299 Broadway, New York City—both in New York. To manufacture garters.

Kentucky Tire & Rubber Association, The, November 13, 1919 (Kentucky), $1,000,000. H. P. Didriksen, president; W. R. White, executive vice-president; J. E. Peterson, secretary. Principal office, 502 Realty building, Louisville, Kentucky. To manufacture tires.

Ludington Rubber Co., November 8, 1919 (Wisconsin), $100,000. A. H. Gruber, president and general manager; G. E. Dorrell, vice-president—both of Ludington, Michigan; W. G. Gruber, vice-president; B. G. Hayden, secretary—both of Milwaukee, Wisconsin; C. D. Moriarty, treasurer, Ludington, Michigan. Principal office, 1015 Trust Company building, Milwaukee, Wisconsin. Factory, Ludington, Michigan. To manufacture tire casings.

Maumee Tire & Rubber Co., The, February 21, 1920 (Ohio), $2,500,000. G. G. Morrison, president and general manager, 1912 Jefferson avenue, Toledo; R. Butler, vice-president and superintendent of production, 116 Parker avenue, Barberton; C. F. Weissenberger, secretary and treasurer, 2133 Vermont avenue; J. B Patterson, sales director, 440 West Bancroft street—both of Toledo—all in Ohio. Principal office, 705 Madison avenue, second floor, rear suite, Toledo, Ohio. To manufacture, buy, sell and deal in rubber tires and inner tubes for automobiles or other vehicles.

Mohawk Valley Amalgamated Tire Stores Corp., March 16, 1920 (New York), $24,000. Stanley and Arthur Newman; G. J. Bates—all of [illegible] Broadway, New York City. To manufacture tires, etc.

Montford Cist Rubber Co., December 5, 1919 (Oklahoma), $150,000. E. C. Osborn; L. Smilie; H. L. McCracken—all of Oklahoma City, Oklahoma. Principal office, Oklahoma City, Oklahoma.

New Haven Rubber Mould & Equipment Co., March 10, 1920 (Connecticut), $100,000.

Northwestern Motor Supply Co., January 20, 1920 (Wisconsin), $25,000. William W. and William K. Strickland, E. F. McCausland. Principal office, Superior, Wisconsin. To deal in all kinds of motor and automobile accessories, etc.

No-Tube Tire Filler Co., Inc., August 30, 1919 (New York), $100,000. W. J. Gallagher, president and treasurer; D. S. Rose, vice-president; K. T. Gallagher, secretary. Principal office, 789 Eleventh avenue, New York City. To manufacture tire fillers.

Palmer Tire Corp., January 22, 1920 (Delaware), $500,000. M. L. Rogers; T. A. Irwin; W. G. Singer—all of Wilmington, Delaware. To manufacture rubber tires, etc.

Polish-American Rubber Mfg. Co., February 24, 1920 (Delaware), $2,000,000. T. L. Croteau; C. H. Blaske; S. E. Dill—all of Wilmington, Delaware.

Quinlan-Treiber Corp., March 16, 1920 (New York), $10,000. J. T. and L. M. Quinlan—both of Lynbrook; P. J. Treiber, 97 Chauncey street, Brooklyn—both in New York. To manufacture tires, etc.

Rappole & Robbins, Inc., March 18, 1920 (New York), $100,000. G. Rappole, S. B. Robbins, A. Volz—all of Jamestown, New York. Principal office, Jamestown, New York. To manufacture tires and automobile accessories.

Record Sales Co., February 28, 1920 (New York), $100,000. W. W. Griffin, 14 Church street; C. B. Cler, 280 Broadway, both of New York City; W. E. Severn, 636 Eastern Parkway, Brooklyn—both in New York. Principal office, 14 Church street, New York City. To sell tires, tubes, etc.

Reindeer Tire & Rubber Co., Inc., March 12, 1920 (New York), $50,000. M. F. Dennis, P. M. Tonn, A. Foy—all of 112 West 23rd street, New York City. To manufacture auto tires and rubber goods.

Re-Nu Tire & Rubber Co., Inc., March 4, 1920 (New York), $10,000. G. Snyder, 271 Madison avenue; G. Graff, 87 Pike street, both of New York City; J. Messner, 1182 Putnam avenue, Brooklyn—both in New York. To rebuild old auto tires, etc.

Rochester Webbing Corp., March 16, 1920 (New York), $50,000. W. D. Smith, E. Kranz—both of East Rochester; W. C. Patterson, Fairport—both in New York. Principal office, East Rochester, New York. To manufacture woven fabrics, auto supplies, etc.

Rub-Tex Products, Inc., March 1, 1920 (Indiana), $750,000. S. C. Legge, treasurer and general manager; L. E. Klug, general superintendent and production manager. Principal office, 454 Lemcke Annex, Indianapolis, Indiana. To manufacture rubber goods, etc.

Rubber Corp. of America, March 10, 1920 (Delaware), $2,000,000. T. L. Croteau, M. A. Bruce, S. E. Dill—all of Wilmington, Delaware.

Scoville & Trevors, Inc., March 22, 1920 (New York), $10,000. Walter A. and Agnes M. Scoville, both of 65 Guernsey street; G. A. Trevors, 703 Manhattan avenue—all of Brooklyn, New York. Principal office, Brooklyn, New York. To deal in tires, etc.

Simplex Rubber Co., February 18, 1920 (Massachusetts), $50,000. G. F. Quinn, Beachmont; W. F. Killip, 134 Bellingham avenue, Revere; A. T. Parsons, 89 State street, Boston—all in Massachusetts. Principal office, Boston, Massachusetts. To manufacture and deal in rubber, rubber goods and products.

Simpson Universal Tire Co. of New York, February 26, 1920 (New York), $300,000. A. Simpson, A. Goetz, A. Scholl, Jr.—all of Richmond Hill, New York. Principal office, Jamaica, New York.

Smith Tire Corp., March 9, 1920 (Delaware), $10,[illegible],000. G. V. Reilly, S. B. Howard, R. K. Thistle—all of New York. To manufacture automobile tires, tubes, etc.

Taintor Trading Co., Inc., January 15, 1920 (New York), $60,000. S. Taintor, president; W. Boyd, vice-president; J. Steel, treasurer; E. A. Stothers, secretary. Principal office, 9 State street, New York City. To do a general trading business.

Trans-Continental Tire & Rubber Co., Inc., February 27, 1920 (New York), $20,000. W. W. Lesselbaum, F. Pruss, E. Eisenstein—all of 128 Broadway, New York City. To manufacture tires.

United Tire Stores Co., Inc., March 6, 1920 (Delaware), $10,500,000. T. L. Croteau, M. A. Bruce, S. E. Dill—all of Wilmington, Delaware. To manufacture and sell tires.

Unsinkable Life Saving Suit Co., Inc., March 10, 1920 (New York), $5,000. W. T. McCoy, 216 West 138th street; C. Mardenbro, 312 West 59th street, R. Washington, 427 West 52nd street—all of New York City. To manufacture rubber suits, etc.

REPUBLIC RUBBER CORPORATION'S NEW PRESIDENT.

E. F. Jones, recently elected president of The Republic Rubber Corporation and the Republic Rubber Co., Youngstown, Ohio, succeeding Guy E. Norwood, resigned, brings to the company thirty years of practical experience in the manufacturing field.


E. F. Jones.

For ten years Mr. Jones was identified in various responsible capacities with the Illinois Steel Co.; then for a twelve-year period with the International Harvester Co., which he served in all departments; later with the Morgan Spring Co. and National Manufacturing Co.; next as president of the Clinton-Wright Wire Co., Worcester, Massachusetts, and more recently as vice-president and general manager of the Elyria Iron & Steel Co., Cleveland, Ohio.

The majority of the directors of The Republic Rubber Corp. consists of iron and steel manufacturers in the Youngstown district, which accounts in a measure for the election of Mr. Jones. He has, however, established a reputation as a capable executive, organizer and business man of exceptional ability that renders his acquisition most fortunate. It is taken to mean the beginning of a new era in the history of the company.

THE REPUBLIC RUBBER CORPORATION.

The Republic Rubber Corporation had its first start nearly twenty years ago when a rubber manufacturing company was organized at Youngstown, in Mahoning County, Ohio, largely through the exertions of John Scott McClurg, who became the manager. It was incorporated as the Mahoning Rubber Co. on February 28, 1901, but by the end of the year it had been found advisable to change the name, and it became the Republic Rubber Co. on December 2.

The capital of $400,000 was easily raised locally as Youngstown hoped to be able to rival its neighbor, Akron, in the rubber industry. The Wick family was interested in the enterprise, and after H. W. Wick, the first president, resigned, his son-in-law, Warner Arms, was elected in his place and held that office until his death in 1910.

From the start the company manufactured rubber goods of all descriptions, fire hose, balata belting, mechanical goods, and molded goods. By 1905 it had taken up tires, both solid and pneumatic. Other specialties of the company were the side wire wheel and golf balls. In that year the capital was increased to $1,000,000. The business continued to expand rapidly, and in 1912 under Thomas L. Robinson, Mr. Arms' successor as president, the capital was increased to $10,000,000.

The spread of the business made it advisable to establish subsidiary companies in various parts of the country, so that when the company was reorganized in 1917, it included the Republic Rubber Co. of New York in New York City; of Massachusetts at Boston; of California at San Francisco; of Texas at Dallas; of Pittsburgh, and the Republic Rubber Co., Inc., at London, England.

On October 6, 1917, the business of the company was taken over by the Republic Rubber Corp., incorporated under the laws of New York with a capital of $11,250,000. The plant at Youngstown then covered 45 acres, with buildings containing 15 acres of floor space, where rubber goods of all kinds were manufactured and 3,000 tires could be turned out daily. With it was then amalgamated the Canton Blackstone Co., which had been the Knight Tire & Rubber Co., of Canton, Ohio, with seven acres


Plant of The Republic Rubber Corporation, Youngstown, Ohio.

of ground, four acres of floor space and the capacity to turn out 1,000 tires a day. The company was incorporated in Ohio in June, 1911, and was amalgamated with the Republic company in 1917; its name was changed to Canton-Blackstone in April, 1919.

In May, 1917, Guy S. Norwood succeeded Mr. Robinson as president of the Republic Rubber Co., coming from The B. F. Goodrich Co. to take the position. The other officers of the corporation were: L. T. Petersen, Harvel J. Woodward and W. W. Roe, vice-presidents; C. F. Garrison, secretary, and M. I. Arms, 2nd, treasurer.

In February, 1920, E. F. Jones was elected president to succeed Guy E. Norwood who resigned. The names of the other officers recently elected will be announced later.

ANNUAL REPORT OF THE B. F. GOODRICH CO.

Sales for the calender year 1919 were the largest in the history of The B. F. Goodrich Co., Akron, Ohio, aggregating $141,343,419, on which the company earned net profits amounting to $17,304,813, after making the usual charges for maintenance, depreciation, bad debts and other items, but before making allowance for such Federal income and excess profit taxes as may be finally determined. In 1918 the sales totaled $123,470,187, and in 1917, $87,155,072.

In consequence of this greatly increased business the dividend on common stock has been advanced from a $4 to $6 per annum basis beginning with the February, 1920, dividend. Sales have been limited only by the ability to produce, and when the additional manufacturing facilities now under construction are brought into production this year, the annual business may exceed $200,000,000.

The consolidated balance sheet, profit and loss, and surplus accounts for the year ended December 31, 1919, are as follows:

CONSOLIDATED BALANCE SHEET.

ASSETS.

Capital Assets:		
Real estate, buildings, plant, machinery and sundry equipment, less reserve for depreciation of $7,565,375.97, including special reserve, per balance sheet, December 31, 1918, of $1,447,540.22 applied as obsolescence for years 1918-1919	$19,486,065.22	
Patents and trade-marks	1.00	
Goodwill	57,798,000.00	$77,284,066.22
Investments and Advances to Other Companies		3,331,360.93
Foreign Associated Companies, etc., representing the net investment at December 31, 1919		6,054,451.19
19,066 Shares of 7 Per Cent Cumulative Preferred Stock in Treasury at par		1,906,600.00
Current Assets:		
Raw materials, partly manufactured and finished stock	$54,184,974.63	
Trade accounts receivable, after deducting reserve to cover doubtful accounts, discounts and allowances	23,011,543.22	
Other accounts receivable	550,208.24	
Bills receivable	44,688.24	
United States Liberty Loan Bonds, at market prices	2,591,535.32	
Cash in banks and on hand	5,491,500.07	
		85,874,449.72
Deferred Charges to Future Operations:		
Prepaid insurance, interest, taxes, etc		1,264,990.25
		$175,715,918.31

LIABILITIES.

Capital Stock:			
600,000 shares of common stock of the par value of $100 each		$60,000,000.00	
450,000 shares of 7 per cent cumulative preferred stock of the par value of $100.00 each	$45,000,000.00		
Deduct—54,000 shares of preferred stock redeemed and cancelled, including $900,000 redeemed during 1919	5,400,000.00	39,600,000.00	$99,600,000.00
100,000 shares of 7 per cent cumulative preferred stock of the par value of $100.00 each, authorized and Unissued	$10,000,000.00		
Current Liabilities:			
Bills payable—general	$22,068,000.00		
Bills payable—secured by deposit of portion of United States Liberty Loan Bonds, per contra	2,000,000.00	$24,068,000.00	
Accounts, payable		5,864,069.30	
Sundry accrued liabilities		1,255,739.23	
			31,187,808.53
Reserves for:			
Contingencies		$2,000,000.00	
Pensions		500,000.00	
Amortization of war facilities		1,225,063.73	
			3,725,063.73
Surplus[1] (per annexed account), before providing for such income and war excess profits taxes as may be finally determined			[illegible]
Contingent Liabilities:			
Bankers loans to employes, secured by deposit of stock of this company, purchased by them, and by the guarantee of the company	956,801.36		
			$175,715,918.31

[1](The common stock dividend of 1 per cent, declared October 15, 1919, payable February 16, 1920, has not been deducted from the surplus shown above.)

PROFIT AND LOSS ACCOUNT

Net sales		$141,343,419.45
Deduct—Manufacturing, selling and general administrative expenses		121,579,265.35
		[illegible]
Add—Miscellaneous income		[illegible]
		$20,340,214.44
Deduct:		
Provision for depreciation	[illegible]	
Interest on bills payable, etc	[illegible]	
		[illegible]
Net profit (before providing for such Income and Excess Profits Taxes as may be finally determined), carried to surplus account		[illegible]

SURPLUS ACCOUNT.

Balance, January 1, 1919		[illegible]
Less reserve for amortization of war facilities		[illegible]
Total		[illegible]
Add—Net profit for the year ended December 31, 1919		17,304,813.33
Premium and accrued dividends received on sale of 150,000 shares of additional preferred stock issued		387,000.00
		$51,586,736.98
Deduct—7 per cent dividend on preferred stock (Nos. 28 to 31 inclusive) for the year ended December 31, 1919	$2,247,000.00	
4 per cent dividend on common stock (Nos. 16 to 19 inclusive) paid during 1919	2,400,000.00	
Reduction of preferred stock purchased, from cost to par	77,778.46	
Additional appropriation for pension fund	[illegible]	
Income and war excess profits taxes paid during the year, applicable to 1918 earnings	[illegible]	
		10,383,690.93
		$41,203,046.05

STATEMENT OF HOOD RUBBER COMPANY.

Hood Rubber Company's sales for the 1919 calendar year totalled $22,969,664, compared with $22,341,081 in 1918, $18,573,765 in 1917, $11,666,501 in 1916 and $9,083,693 in 1915. Of 1919 total sales, $6,593,984 was from tires, compared with $4,834,925 in 1918.

Balance sheet as of December 31, 1919, compares with the two previous years as follows:

ASSETS.

	1919	1918	1917
Plant (real estate, machinery, etc.)	$4,200,000	$4,000,000	$4,000,000
Merchandise	7,156,022	8,012,862	4,075,021
Accounts receivable	3,111,907	1,202,350	4,323,933
Cash	1,084,348	1,022,878	930,680
Investments in other corporations	410,400	285,400	184,400
Patents	1,000	1,000	[illegible]
Liberty Bond account	103,404	521,020	[illegible]
Total	[illegible]	$15,045,510	$13,748,131

LIABILITIES.

	1919	1918	1917
Capital stock common	$3,000,000	$3,000,000	$3,000,000
Preferred	5,000,000	4,000,000	4,000,000
Notes payable	4,860,000	4,725,000	4,150,000
Liberty Bond account	....	505,000	285,840
Accounts payable	[illegible]	148,905	..
Surplus	[illegible]	2,666,605	[illegible]
Total	$16,067,081	$15,045,510	$13,748,131

The treasurer's report states that earnings for 1919 were less than the three years previous, as prices of footwear were lower and costs higher in 1919 than in 1918. Prices on footwear were advanced on January 1, 1920, and this increased margin, together with the increased efficiency of the factory and the economy of the Hood Rubber Products Co. should show satisfactory earnings for 1920. Net quick assets have increased from about $5,400,000 on December 31, 1918, to about $6,252,000 on December 31, 1919.

THE ADVANCE IN TIRE PRICES.

The long anticipated rise in the price of tires has gone into effect. It became inevitable when the shortage in the necessary qualities of cotton, and the resultant inability to manufacture in sufficient quantities the fabrics made from it, became known. The increase in tire prices would have been made last October had it not been for the foresight of many companies, which secured supplies for some months ahead. Another cause for higher prices is the reduction in tire prices which many large companies made last spring so that in some cases the present increase merely restores the prices that prevailed before May.

One of the largest tire companies, by increasing the price of both fabric and cord casings 17½ per cent, restores the prices it charged before May; its plain tread fabric tires are 10 per cent below the price of fabric and cord casings, and 5 per cent below their rib-tread cord casings. Tubes have been advanced 15 per cent, motorcycle casings and tubes 20 per cent, cord pneumatic truck tires and tubes 20 per cent, solid and cushion tires from 10 to 15 per cent.

Other large companies have made advances such as these: fabric casings, 18 per cent; cord casings, 20 per cent; gray tubes, 10 per cent; red tubes, 7½ per cent; fabric and cord tires, 17½ per cent; red and gray tubes, 15 per cent; plain tread fabric tires, 25 per cent; fabric non-skid, 17½ per cent; plain fabric, 25 per cent; ribbed cord, 10 per cent; non-skid cord, 8 per cent; tires and tubes, 15 per cent.

Apparently one-sixth of the former price has been added on the average to the cord and fabric tires and from one-tenth to one-eighth to that for tubes.

PERSONAL MENTION.

William S. Bloomer has been appointed Chicago district manager of the Quaker City Rubber Co., Philadelphia, Pennsylvania.

R. W. Ashcroft, who recently resigned as advertising manager of the United States Rubber Co., New York City, a position he had held for the last four years, and previously advertising manager of the Canadian Consolidated Rubber Co., Limited, Montreal, has been appointed director of publicity of the Ames Holden McCready System in the latter city.

A. C. Frank, export manager of the Firestone Tire & Rubber Co., Akron, Ohio, recently returned to New York City after a three-months trip to England and the Continent. He reports that the industrial activity of Belgium is particularly noticeable and that that country is now rapidly placing its factories on a quantity production basis and rehabilitating the devastated districts.

Robert S. de Orrell, formerly with the Hartford Rubber Works Co. and the Lee Tire & Rubber Co., has been appointed superintendent of the Washington Tire & Rubber Co., East Sprague avenue, Spokane, Washington.

J. B. Cothran, who was recently appointed manager for the Globe Rubber Tire Manufacturing Co.'s New York district, is one of the most popular men in the tire business. His headquarters will be 1851 Broadway, New York City.

Fred B. Geary, who was succeeded by J. B. Cothran, has been advanced to the position of general factory representative.

Charles W. Wood, crude rubber broker, 149 Broadway, New York City, who was successfully operated on last month, is rapidly convalescing.

E. S. Benson, formerly of Detroit, Michigan, has been appointed manager of the New York City office of The Fisk Rubber Co., Chicopee Falls, Massachusetts, and assumed his new duties March 1. His headquarters are at 1725 Broadway.

E. B. Tozier has resigned as secretary and general manager of the Century Rubber Works, Chicago. He is now at 1307 Rector Building, Chicago.

Henry S. Kimball and W. H. Swift have been elected vice-presidents of Gaston, Williams & Wigmore, Inc., international merchants, 39 Broadway, New York City.

George H. Lincks, who has been in the employ of William H. Scheel, 159 Maiden Lane, New York City, for the past 31 years as chief of staff with full charge of the buying and selling, has resigned and will conduct a general chemical business under the name of George H. Lincks at 106 Wall Street, New York City.

Robert Allan, formerly manager of the London & Brazilian Bank at Pará, Brazil, is now with the American Mercantile Bank of Brazil, Inc., at Pará.

W. J. Harris and G. E. James, of the Avon India Rubber Co., Limited, Melksham, Wilts, England, were recently in the United States on the company's business.

F. O. Holbrook of the Isleworth Rubber Co., Limited, Isleworth, Middlesex, England, has been in the United States for several weeks in the interest of his company.

D. MacArthur is now in the United States on a business trip in the interest of the North British Rubber Co., Limited, Edinburgh, Scotland.

J. Alfred Corbiey has recently joined the sales force of Tyer Rubber Co., Andover, Massachusetts. Mr. Corbiey was formerly with the Gates Rubber Co., Denver, Colorado, and will cover the Middle Atlantic States.

AN INCREASED PRODUCTION CONVENTION.

Seeing in increased production a means of restoring normal business and price conditions, the Chamber of Commerce of the United States will make its eighth annual meeting, to be held at Atlantic City, New Jersey, April 27 to 29, 1920, an "Increased Production Convention."

The general subject of increased production has been divided up in the program for the convention into sub-subjects. The first to be taken up will be the government in relation to production. Under this heading will be considered anti-trust legislation and taxation, especially the subject of excess profits taxes, against which there has been general complaint. The second general subject to be taken up will be land and water transportation in relation to production. International finance and its relation to world production will be discussed from the point of view of both the financier and the business man.

One general session of the convention will be given over to agriculture in relation to production and another important general subject will be the relation of labor to production.

Besides the general sessions there will be held group meetings, divided as along the great division of industry. In these meetings the subject of increased production, as in the general meetings, will be the main topic discussed.

ANNUAL MEETING OF NATIONAL ASSOCIATION OF WASTE MATERIAL DEALERS.

The annual meeting of the National Association of Waste Material Dealers was held at the Hotel Astor, New York, March 15 to 17, 1920. The Scrap Rubber Division met on the 15th and chose as chairman for the ensuing year Nat E. Berzen, of the New York firm of the same name.

Aside from an examination into the conditions the scrap rubber and rubber reclaiming industry is facing, the meeting concerned itself with drafting two resolutions designed to expedite business. The first provided that interest be charged reclaimers on all overdue accounts, and it was voted that a copy of this resolution be sent to all members of the Reclaimers' Division of The Rubber Association of America, as well as to reclaimers outside of this body.

The second resolution provides that the railroads be asked to change the carload rating on scrap rubber shipments from fifth to sixth class. In the movement to bring this about the secretary was ordered to cooperate with the Reclaimers' Division of The Rubber Association of America, Inc.

EASTERN AND SOUTHERN NOTES.

By Our Regular Correspondent.

The Rubber Trading Co., 9-15 Murray street, New York City, announces that after March 22 it will do business under the corporate name of Baird Rubber & Trading Co. The officers are: William T. Baird, president and treasurer; Robert B. Baird, chairman of board; Collier W. and Robert D. Baird, vice-presidents; William T. Baird, Jr., secretary.

The Morse Chain Co., Ithaca, New York, has opened a new office at 1402 Lexington Building, Baltimore, Maryland, in charge of E. R. Morse, manager, and one at 302 Harrison Building, Philadelphia, Pennsylvania, in charge of M. H. Rodd, manager.

The Madison Tire & Rubber Co., Inc., has purchased the building at 20 West 60th street, New York City, and is remodeling it for a show-room and executive offices which it will occupy after May 1.

The Roessler & Hasslacher Chemical Co. will remove on April 1 from 100 William street to more commodious quarters at 709-717 Sixth avenue, corner of 41st street, New York City. Mail should be addressed to postoffice box No. 119, Times Square Station.

MacArthur & White, Inc., crude rubber brokers, with offices at 150 Nassau St., New York City, and Guth-Otis Building, Akron, Ohio, is a recently organized concern, although the members are well known crude rubber men. William MacArthur, who was recently associated with Hardy & MacArthur, will be in charge of the New York office, assisted by C. J. Lockhorn. A. R. White, who was formerly with J. T. Johnstone & Co., will have charge of the Akron office, and be assisted by Stuart Brown.

Hummel & Robinson, New York City, exporters, importers, and manufacturers of chemicals for the rubber trade, have appointed W. R. Sturges their representative and agent in southern territory for the sale of dry colors and chemicals. Mr. Sturges has been with Reichard-Coulston, Inc., New York City, in the same line of business, for the last seven years.

The Bargain Tire Co., incorporated in New York in 1917, to repair tires, etc., at 200 West 111th street, has been dissolved under the laws of that state.

The world's largest manufacturer of lead pencils is the Eagle Pencil Co. of New York City. The products of the company include every variety of pencil known to the trade, as well as rubber erasers, fountain pens, penholders and a multiplicity of styles of steel pens for every requirement. In ordinary pencils alone the daily output amounts to ten gross, practically 1,500 each minute. The Blaisdell paper pencil company has recently been acquired by the Eagle company and this line added to the output. One of the many departments of the Eagle plant is that devoted to making rubber erasers in various forms and colors.

The Henderson Tire Export Co., Inc., has opened offices at 17 West 42nd street, New York City, in addition to its new factory at Columbus, Ohio. The officers are C. Bernard Schmolle, president; W. H. Queripel, vice-president and treasurer; C. O. Henderson, of the Henderson Tire & Rubber Co., vice-president, and P. A. Zizelman, secretary. They will construct the Henderson millimeter tire, with special reference to the foreign market.

Under the auspices of the State and City of New York, the Firestone film, "Careless America," was recently shown to more than 5,000 school children at the Capitol Theatre, New York City, as the opening wedge in a nation-wide "Safety First" campaign.

The film was made by the Universal Film Co. for Harvey S. Firestone, who is seeking to impress upon Youthful America the dangers of careless pedestrianism, and upon automobilists, the evils of reckless driving. It depicted distressing accidents and gave the A. B. C.'s (Always Be Careful) of "Safety First."

Laidlaw, Kelley & Co., Inc., 14 Platt street, New York City, importer, exporter, and manufacturers' agent, has acquired a 21-year leasehold on the seven-story and basement building at the southwest corner of Thompson and Grand streets, and will consolidate there its various departments now located in several downtown buildings.

The Century Rubber Stamp Works, Inc., 551 Pearl street, New York City, has been formed from the partnership started eight years ago by a number of men who had been in the rubber stamp business from 18 to 30 years. Harry Heine is president.

The National Aniline & Chemical Co., Inc., 21 Burling Slip, New York City, has elected the following directors: Orlando F. Weber, H. H. S. Handy, W. N. McIlravy, Dr. W. G. Beckers, L. C. Jones, C. S. Lutkins, Henry Wigglesworth, W. J. Matheson, T. M. Rianhard, Dr. R. C. Taggesell, and F. M. Peters. The number of directors has been reduced to twelve. The directors, in turn, have appointed the following officers: president, chairman of the board, and chairman of executive committee, O. F. Weber; vice-presidents, Dr. W. G. Beckers, J. W. Newlean; acting treasurer, William H. West; secretary, H. F. Atherton; assistant treasurers, H. S. Trott, T. S. Baines; assistant secretary, R. V. Mahon.

The Katzenbach & Bullock Co., Inc., 100 William street, New York City, has bought the six-story and basement building at 440 Washington street, into which the company plans to move about April 1. The first and second floors will be used for offices; the balance for storage, laboratory, testing rooms, etc.

The Rubber Industries Athletic League of New York City held its first annual entertainment and reception at the Central Opera House, 67th street and Lexington avenue, New York City, March 23, which included a vaudeville performance and a ball. More than fifteen rubber companies were represented in the large attendance.

The Rubber Products Co., Barberton, Ohio, has appointed H. P. Harding eastern district manager.

The Rubber Engineering Co., Akron, Ohio, has appointed W. S. Innes its representative, with offices at 72 Trinity Place, New York City.

The Sydeman Rubber Co. has moved from 225 Fourth avenue to 222 Fourth avenue, New York City.

The Eckrode Rubber Co., Inc., Newark, New Jersey, has appointed Harold L. Pettingell its eastern and southern district manager. He was formerly with the Ajax Rubber Co., Inc., New York City, as assistant manager for two years, and previous to that was special representative of the Lee Rubber & Tire Co. for four years.

The General Electric Co., Schenectady, New York, will build in that city a six-story addition to its plant, 54 by 219 feet, to cost approximately $400,000.

The plant of the former Kavanaugh Knitting Co., Waterford, New York, has been acquired by the Beaver Mills, North Adams, Massachusetts. The latter manufacture yarn and tire fabric and the new mill is being adapted for the manufacture of tire yarns and will produce fabric the latter half of this year.

The Achilles Rubber & Tire Co., Inc., Binghamton, New York, has added another floor to its former three-story factory, enlarged the vulcanizer room, erected a new one-story warehouse, 40 by 80 feet, and built a new structure, 60 by 100 feet, for the storing of rubber, washing and drying rubber, cement mixing, and spreading. A larger building for the manufacture of tires and tubes is to be built as soon as the weather permits, to cost $600,000. The present factory will then be used for the manu-

facture of rubber footwear. Harry J. Smith is president and A. W. Caney vice-president.

The Lehigh Tire & Rubber Co., Pottstown, Pennsylvania, has changed its name to the Vulcweld Tire & Rubber Co. J. A. Maney is secretary.

The London Rubber Co., Pittsburgh, Pennsylvania, has elected the following officers: A. L. London, president; C. M. London, vice-president; H. London, secretary and treasurer.

The Union Rubber and Asbestos Co., Warren, Pennsylvania, has been incorporated under the laws of New Jersey to manufacture, buy, and sell mechanical rubber goods and asbestos materials. Donald W. Mackie is president; J. M. Shear, vice-president; Harry M. Prill, treasurer; and Charles H. Swoger, secretary; directors—R. A. Mackie, J. E. Golden, Thomas Flynn, and E. G. Cottingham. The personnel includes men familiar with the rubber needs of the oil field industry.

The Corona Cord Tire Co., East Butler, Pennsylvania, has removed the machinery in the buildings which it purchased in September last on the 20-acre property near Butler, and has progressed with the installations of its own machinery to the point where it hopes to begin production of tubes in February and of cord tires in March, to which line it will confine its business. The officers are: Thomas Phillips, Jr., president; H. B. Callahan, vice-president; C. H. Miller, secretary-treasurer. The directors include, in addition to the foregoing, J. V. Ritts, Elias Ritts, B. D. Phillips, and A. C. Fisher.

The New Castle Rubber Co., New Castle, Pennsylvania, is greatly increasing its facilities for the manufacture of fabric and cord tires and inner tubes. Many changes are being made at the company's plant at Mahoningtown and modern equipment is being installed. A new executive office is under construction and will be ready for occupancy this spring. Over 1,200 tires per day are being manufactured at present.

The officers are F. A. Krusemark, president; H. G. Carpenter, vice-president; L. G. Funkhouser, general manager, and F. T. Hutson, secretary-treasurer.

The Kelley Tire and Rubber Co., Inc., 962 Chapel street, New Haven, Connecticut, is excavating for its plant to be built at West Haven, on the line of the New York, New Haven & Hartford railroad. It is expected that the office building will be completed in April. All machinery and equipment for building 500 "Kelley King of Kord" tires and 1,000 tubes daily has been purchased and orders are being taken for delivery on July 1.

The Norwalk Tire & Rubber Co., Norwalk, Connecticut, is building an addition to its plant, 158 by 83 feet, six stories high, which it expects to occupy within a month. The construction is brick with steel frame.

The McClaren Rubber Co., Charlotte, North Carolina, has appointed the McClaren Rubber Tire Co., 327 West 57th street, New York City, its distributer.

The Diamond Holfast Rubber Co., 33 Auburn avenue, Atlanta, Georgia, will build a rubber plant to cost approximately $1,000,000 and will increase its capital to $2,500,000. H. Diamond is president.

The Virginian Rubber Co., Charleston, West Virginia, is building and has about half completed its two-story brick and concrete factory building, 100 by 260 feet, and a power house 50 by 40 feet, has been almost finished. The total cost will be about $275,000, and the company will manufacture both cord and fabric tires. Operation about June 1 is expected. The officers are: A. A. Lilly, president; Houston G. Young, vice-president; W. D. Guyer, secretary and treasurer; E. P. Stroman, general manager and T. A. Conger, general superintendent, formerly with the Henderson Tire & Rubber Co., at Bucyrus, Ohio.

The Kentucky Tire & Rubber Association, Louisville, Kentucky, newly incorporated for the purpose of manufacturing "Blue Grass Kord" tires, has temporary executive offices at 502-503 Realty Building. The construction of the first unit of its factory will be started at an early date. This will be 60 by 400 feet, part two stories high, and will be located on the K. & I. railroad.

The officers of the new company are: H. P. Didriksen, president; W. R. White, executive vice-president; J. E. Peterson, secretary; directors, H. J. Huff, Perry Frantz, O. R. Peterman, A. D. Hite, and J. W. Cambron.

THE RUBBER TRADE IN NEW JERSEY.

By Our Regular Correspondent.

TRENTON NOTES.

The recent freshet in the streams of this section caused a serious loss to the Empire Rubber & Tire Corp., situated on the Assunpink creek and necessitated closing the plant for more than a week. The boiler rooms and lower floors of the works were flooded and generators, motors, etc., were badly damaged by water. When the plant was finally put into shape for operation a second freshet caused further damage and the works closed again. The loss from the two freshets will total many thousand dollars. Apart from stock and machinery damage the company has lost heavily in curtailed production. The tire department on the lower floor is where the water did the most damage. The Joseph Stokes Rubber Co. was also flooded, causing the works to close down at a loss of several thousand dollars. The Crescent Belting & Packing Co. also suffered a considerable loss. The Bergougnan Rubber Manufacturing Co. was closed down for a day because the employes were unable to reach their work, due to the blizzard stopping the trolley lines.

Mayor Frederick W. Donnelly plans to prevent the future flooding of the rubber plants along the shores of the Assunpink Creek by the building of a long retaining wall. A conference was held between the mayor and representatives of the Puritan Rubber Manufacturing Co., Empire Rubber & Tire Corp. and the Joseph Stokes Rubber Co. The proposed wall will contain 17,000 feet of material and will cost about $150,000. The expense will be borne equally between the rubber manufacturers and the city of Trenton. C. Edward Murray, Jr., second vice-president of the Empire Rubber & Tire Corp., was made a member of the committee in charge.

Everything in the rubber line from tires to small hose has been advanced in price by Trenton manufacturers during the past month and prices will remain up for some time. There had been a general advance along all lines. The increased rates are due chiefly to the higher cost of cotton fabric, which has trebled in price during the past year. Compounding ingredients have also advanced materially. While there had been an increase in the cost of labor during the year, the advanced prices of manufactured goods are principally due to the cost of raw materials.

The plant of the Nearpara Rubber Co., East Trenton, was destroyed by fire on March 17, causing a loss of several thousand dollars. Herman Rosenthal, the proprietor, announces that he will build a new plant. Considerable stock was burned. The building was of frame construction, 125 by 60 feet in size.

The winter home of George R. Cook, situated at Camden, South Carolina, was recently destroyed by fire, including all the household goods. The cause of the blaze is unknown and the loss is very heavy. Mr. Cook is president of the Acme Rubber Manufacturing Co., and the Hamilton Rubber Manufacturing Co., both of Trenton.

W. O. Rutherford, vice-president of The B. F. Goodrich Rubber Co., Akron, Ohio, was entertained recently at dinner at the Trenton Club by John S. Broughton, president of the United

& Globe Rubber Co., Trenton. A number of Trenton rubber manufacturers were present. Following the report Mr. Rutherford visited several of the Trenton rubber plants and the points of historic interest in old Trenton.

John A. Lambert, treasurer and general manager of the Acme Rubber Manufacturing Co., has been elected president of the Trenton Chamber of Commerce at its annual reorganization meeting. Mr. Lambert was first vice-president of the organization and also chairman of the manufacturers' bureau. He has for many years been deeply interested in the affairs of the Trenton Chamber of Commerce. His term of office is for three years.

John S. Broughton, president of the United & Globe Rubber Co., has offered three prizes of $5 each for the highest averages in the work in the mechanical drawing classes at the Trenton School of Industrial Art.

General C. Edward Murray, of the Empire Rubber & Tire Corp., and W. J. B. Stokes, of the Thermoid Rubber Co., have been appointed members of the committee to raise $35,000 for the Trenton Welfare Association.

The Whitehead Bros. Rubber Co., Trenton, has elected Samuel Cadwallader secretary and manager, succeeding the late Alfred Whitehead. Charles W. Appleget has been appointed sales manager for the same company.

MISCELLANEOUS NEW JERSEY NOTES.

James Deshler Wilmot, for the past three years superintendent of the United States Rubber Co.'s plant at New Brunswick, has been promoted to the position of production manager of the Goodyear's India Rubber Glove Manufacturing Co., Naugatuck, Connecticut. Mr. Wilmot was succeeded in New Brunswick by Seymour Hadaway, of New Rochelle, New York, who has had charge of the service department of the company's plants at New Haven, Connecticut. Mr. Wilmot has several times been promoted by the company, and has planned and carried forward many improvements for the benefit of the workers. The various clubs and recreational facilities at the New Brunswick plant were all planned by him and he has looked out for the welfare of the employes at all times. He planned and equipped the hospital where injured employes are treated and also inaugurated the citizenship school for foreign workers, and the athletic teams.

The Michelin Tire Co., Milltown, New Jersey, is planning shortly to erect fifty new frame cottages at Milltown for the use of the company's workmen. The houses will contain five rooms and bath, and will be erected on land owned by the company. More houses will be erected later.

The Stanwood Rubber Co., Inc., Elizabeth, New Jersey, which has executive offices at 9 East 40th street, New York City, is to build a new power plant, 75 by 84 feet, on a solid concrete and steel mattress. The first floor of the company's main building, which is about 150 feet from the power house, will be used for mill and calender room, while the second floor will be devoted to tire building and finishing, and the third floor will be used as a tire repairing room. The company is utilizing the former plant of the Hardman Rubber Corp. at New Brunswick, which it purchased some time ago, for the manufacture of its tubes.

Smith & Serrell, manufacturers of machinery couplings, have removed from the West street building, New York City, to 44 Central avenue, Newark, New Jersey.

The Driver-Harris Co., Harrison, New Jersey, has increased its capitalization to $3,000,000, divided equally between common and preferred stock. The company is building a three-story addition to its plant, 52 by 100 feet, and is planning to add to this a 100-foot extension of equal height. The upper floor will be used as the general office, the second floor for spooling and testing room, and the ground floor for shipping and clearing departments.

THE RUBBER TRADE IN MASSACHUSETTS.

By Our Regular Correspondent.

During the recent traffic tie-up in New England, due to the series of blizzards which twice put the railroads more or less completely out of commission for several days, rubber plants were seriously affected. For a time snow shoveling was the principal business of many a rubber mill operative in an attempt to keep sidings clear. And when the Boston Chamber of Commerce sent out a call for men to assist the railroads to clear their lines, rubber men were among those who responded. Trucks were found inadequate for local deliveries, and several companies, including the Monatiquat Rubber Works Co., South Braintree, resorted to horses and pungs.

On account of the embargoes on freight and express, the Boston Rubber Shoe Co. and the Converse Rubber Shoe Co. supplied their customers by parcel post shipments. It became almost a common sight to see the sidewalk in front of the Malden post-office blocked with several hundred cases of rubber footwear awaiting shipment. Several companies in the Boston district were perilously near a shut-down due to lack of coal, and the Panther Rubber Manufacturing Co., Stoughton, was actually closed for a few days. The Avon Sale Co., of Avon, tided itself over the period of fuel shortage by burning wood. The Revere Rubber Co., Chelsea, is installing an oil-burning system which it is believed has many advantages and will reduce the uncertainty of fuel supply to a minimum.

The eighteenth annual Boston Automobile Show under the auspices of the Boston Automobile Dealers' Association, Inc., was held from March 13 to 20 inclusive, and was in every respect the greatest ever held in this city. Mechanics Building proved inadequate and many of the exhibits were housed in the South Armory nearby in Irvington street for the benefit of the Y. D. Club. While it was essentially a show of motor vehicles, the exhibits of accessories were many and varied. Tires were never more in evidence, but for the most part displayed by local agents and distributers rather than the manufacturers. Giant cord tires for trucks were a conspicuous feature.

Among the exhibits of interest to the rubber trade were the following: Arrow Grip Manufacturing Co., non-skid devices; Bascon's Inc., Victor tires; Bigelow & Dowse Co., Franklin tubes; Budd Wheel Corp., Michelin steel disk wheel; Central Automobile Tire Co., tires and tubes; L. C. Chase & Co., top material; A. L. Cherry, Inc., Gordon tires and tubes; Cobb Electric Appliance Co., tube vulcanizers; Columbia Tire & Top Co.; Eastern Rubber Co., Magic Rubber Mend; Green & Swett Co., Amazon and Miller tires; Grow Tree Co., Grow tires; Holland System, Inc., Trading Corporation, Overman tires; Lambert Trublpruf Tire Co., Lambert Trublpruf tires; New England Savold Tire Co., rebuilt tires; Northwestern Chemical Co., cements, tire and rim paints; Perrine Co., Braender tires and tubes; Record Tire Sales Co., rebuilt tires; E. P. Sanderson Co., Viking tires and tubes; Sewell Cushion Wheel Co., Sewell cushion wheel; Story Rubber Corporation, Bonner tubes; Times Square Auto Co., Buckskin, McLean, Timesco and Triumph tires and Timesco and Triumph tubes; Wetmore-Savage Co., Auburn tires; Austin J. Wright, Coffield tire protector.

The Owen Tire Co., 177 Portland street, Boston, has secured the exclusive New England agency for the McClaren J. & D. tires manufactured by the McClaren Rubber Co., Charlotte, North Carolina, and is seeking local dealers throughout the territory.

Two days prior to the opening of the Boston automobile show the Michelin Tire Co. began holding its convention of New England salesmen at the Copley Square Hotel. At these daily conferences several officials from the home office were present, including J. A. Hines, assistant sales manager; J. J. Rooney,

credit manager, R. B. Bramwell, advertising manager, and W. L. Hogarty, Boston branch manager.

The Franklin Rubber Co., 134 Federal street, Boston, recently declared a regular annual dividend out of the earnings of 1919. At that time the corporation voted a dividend of like amount to be given to the employes April 1, based on their salaries for 1919. This new departure met with a gratifying response by the employes.

A new rest room for the girls in the Boston office of Everlastick, Inc., 52 Chauncy street, has recently been opened. It is attractively furnished and has electric stoves for warming food brought for luncheon.

At last automobile tires are among the articles being sold on the deferred payment plan. Farley & MacNeill, 107 Federal street, Boston, are offering Cleveland-Standard fabric and Tiger-Foot cord tires for a first payment down of 20 per cent of the list price and the balance in easy monthly installments covering a period of four to six months. These tires are made by the Standard Tire Co., Willoughby, Ohio, and carry guarantees of 6,000 and 10,000 miles, respectively.

The Greene & Daniels Co., Boston and Pawtucket, Rhode Island, which was incorporated under Massachusetts laws October 8, 1919, by articles of amendment filed December 1, 1919, changed its name to The Ninigret Mills. The authorized capital stock is $1,050,000, and the company has mills at Pawtucket and Westerly, Rhode Island. H. T. Dunn is president and H. G. Fisk, Chicopee Falls, Massachusetts, is treasurer and clerk. The principal office is in Pawtucket, Rhode Island, the company having incorporated in that state under the name of The Ninigret Mills Co., November 20, 1918. The company manufactures all kinds of textiles and yarns, including tire fabrics. Further information about the development of this organization appeared in our issue of February 1, 1920.

James E. Odell, crude rubber broker, 200 Devonshire street, Boston, who has undergone a series of hospital operations during the past four months, is on his feet again, and after two months in the South hopes to resume his former activities. Meanwhile, the business is being ably conducted by his son, James E. Odell, Jr.

Coincidentally with the celebration of its eleventh anniversary, the Monatiquot Rubber Works Co., of South Braintree, Massachusetts, announces the election of the following officers: James H. Stedman, president and treasurer; Merton A. Turner, vice-president and sales manager, and Benjamin Ayer, general factory manager.

Mr. Stedman is well known to the trade as the founder of this company and for his former prominence in the scrap rubber industry. He is still a young man despite many years of business activity.

Mr. Turner joined the company as a salesman at its inception and his success is evidenced by his election to the new office and the board of directors. He is one of the best known figures of the reclaimed rubber industry.

Mr. Ayer joined the organization in 1910 after his graduation from Dartmouth College, and advanced through the successive stages of foreman, production superintendent and factory superintendent to his present office. He is a keen student of labor and production conditions, and is the originator of methods which have signally increased the value of the company's recent successes.

The various teams of the Fisk Athletic Association of The Fisk Rubber Co., Chicopee Falls, Massachusetts, have always held high places in the rubber mill athletic activities of the country. And now comes the good word that the Red Tops on March 12 and 13 won the industrial championship of the United States in the American Industrial Athletic Association basketball tournament at Akron, Ohio

To take care of the increased demand for "Big Nine" tennis shoes, which has exceeded the production facilities of the Malden factory, the Converse Rubber Shoe Co. has opened a stitching department at Concord.

L. J. Waldron, who has been selling Vacuum Cup tires in this territory for five years, has been appointed sales manager for New England by the Pennsylvania Rubber Co., with headquarters at 683 Beacon street, Boston.

The Akron Tire & Rubber Co., 24 Columbus avenue, Boston, is perfecting plans for opening a chain of branch stores in leading New England cities.

The Ajax Rubber Co., Inc., 158 Brookline avenue, Boston, has secured a fleet of Maxwell cars for the use of its several salesmen who call on New England trade. E. D. Winans, general manager, claims that a salesman's efficiency is increased from 25 to 60 per cent by the use of an automobile.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE MANUFACTURERS of rubber goods of all description in Rhode Island are still struggling to overcome the setbacks experienced since the beginning of the year through weather conditions. Ever since before Christmas the railroads and highways have been hampered by the worst accumulation of snow and ice that has been known in this vicinity since 1857. Train and trolley service was badly crippled, all freight traffic suspended and all movements of coal crippled. In consequence practically every plant in the state was idle for longer or shorter periods.

Business activities continue brisk and with good orders on their books all of the concerns are preparing for a considerable increase in volume that will exceed anything ever experienced. With the advent of settled weather, alterations, expansions and improvements are being generally rumored. Not only are the regular rubber plants active but also numerous textile plants that are manufacturing tire fabrics. A number of additional textile concerns are preparing to equip their plants, or a portion thereof, for tire fabric production which is expected to become a very substantial branch of both the rubber and the textile industries of the future.

The plant of the Ninigret Mills Co., Westerly, Rhode Island, owned by The Fisk Rubber Co., wherein is manufactured cord tire fabric, is running 23 hours daily and has been for several weeks past. The company has secured a new site and work is to commence on a new mill as soon as the weather becomes settled. The officers of the concern have already been transferred from the offices of the Westerly Textile Co., on Main street, to the new plant of the Ninigret Co., on Canal street, where convenient and attractive quarters have been established.

The additions to the plant of the Revere Rubber Co., Providence, that have been in process during the winter are now practically completed and are being occupied by the concern, greatly increasing its capacity and facilities. The new buildings cost upwards of $200,000 and consist of two three-story concrete structures, one 150 by 50 feet, to be used as a chemical laboratory and the other, 120 by 100 feet, for manufacturing purposes. The latter also contains an employes' restaurant and recreation rooms such as have come to be regarded so favorably as essentials of contented economic community life. The combined floor space of both buildings amounts to 60,000 square feet and the latest types of machinery and laboratory apparatus are now being installed.

The new tire factory of the United States Rubber Co., in Providence, is to be called the "Colt Plant," in honor of Colonel Samuel P. Colt, chairman of the executive committee of that corporation. The factory is one of two units operated as the

Revere Rubber Co., and has heretofore been known as Revere Plant No. 2. It is planned that all of the truck tires, both solid and pneumatic, made by the United States Rubber Co., be manufactured at this plant, and to that end considerable new machinery and equipment are being installed.

During the recent freight embargo and bad condition of the roads the National India Rubber Co., Bristol, found the equipment of its batteries of boilers for oil burning especially efficacious. At present five boilers at the company's plant are "fired" by fuel oil and eleven by coal. But the company has arranged so that the latter will be equipped for oil burning in the near future.

The management of the National Co. continues to give much attention to the consideration of the welfare and social interests of the employes and already plans are under way for numerous athletic and out-door activities for recreation during the coming season. Recently a band was organized among the employes and this has been furnished with proper instruments and a competent band director engaged. William Ferrara has been elected bandmaster.

Work has been started on a one-story brick addition, 20 by 64 feet, at the plant of the American Wringer Co., on Social street, Woonsocket. It will cost about $5,000.

The Weybosset Vulcanizing Shop, 362 Weybosset street, Providence, is being conducted by Wilfred Ginsell, according to his statement filed at the city clerk's office.

Work is nearly completed on a two-story brick addition, 38 by 30 feet, to an office building on Fairmount street, Woonsocket, for the Woonsocket Rubber Co., to cost about $10,000.

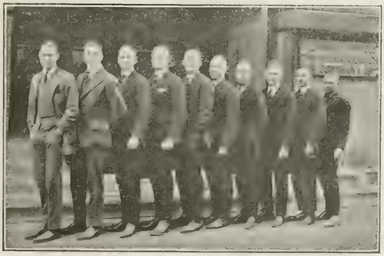
The management of the Davol Rubber Co. announced that with the beginning of March a pay advance in the form of a bonus of 10 per cent for all employes who by promptness and attendance show interest in their work. This is to be paid at the end of each week, and represents the third general increase that has been made by this company during the past eight months.

THE RUBBER TRADE IN OHIO.

By Our Regular Correspondent.

AKRON NOTES.

THE B. F. GOODRICH Co., Akron, maintains a body of trained men to guide visitors, and particularly those interested in the sale and manufacture of tires and rubber goods, through



GOODRICH FACTORY GUIDES.

its factories, and to explain to them methods and processes in rubber manufacture. This service, which was suspended in part during the war, is in full force again.

The factories have been inspected by visitors and associations from all parts of the world, among them the Foreign Trade Commission, which made a tour of the United States.

The Goodrich post of the American Legion has been officially named L. H. Kneil Post No. 255, in memory of Corporal L. H. Kneil, 55 Company, Fifth Marines, Second Division, who was wounded in action on the Meuse November 11, 1918, and died the following day. He was a member of department No. 16 of the Goodrich organization.

At intervals of one month during the fall and winter season rubber workers of The B. F. Goodrich Co., Akron, assemble in their recreation hall to witness lively boxing exhibitions by fellow employes. The accompanying picture was snapped at a recent "smoker," which was attended by nearly 2,000 people. A special clubhouse and training quarters are provided for the pugilistic students. Simms, the boxing instructor, has developed dozens of fast amateur fighters who had never before donned padded gloves.

GOODRICH BOXING CLUB'S HOME

Goodrich Recreation Hall is located in the heart of the plant and is equipped with up-to-date gymnasium apparatus, shower baths, lockers and the like. During noon hours an orchestra plays while employes dance. Moving-picture shows, lectures and social affairs are held at Recreation Hall.

BABCOX JOINS AKRON ADVERTISING AGENCY.

Edward S. Babcox, who was sales manager of the Rubber Products Co., Barberton, Ohio, has resigned that position to accept the vice-presidency and a directorship in The Akron Advertising Agency Co., Akron, Ohio.

EDWARD S. BABCOX.

For two terms Mr. Babcox served as vice-president of the Association of National Advertisers and he also was president of the Audit Bureau of Circulations.

Mr. Babcox's advertising experience dates back more than twelve years when he was a member of the advertising department of Yawman & Erbe, Rochester, New York, manufacturers of office supplies. From Yawman & Erbe he went to the Burroughs Adding Machine Co., Detroit, Michigan, as assistant advertising manager. A year or so later, Yawman & Erbe called him back to Rochester as advertising manager, and he remained there until 1913, when he took over the advertising managership of the Firestone Tire & Rubber Co. He served in this capacity six years, after which he accepted the sales managership of the Rubber Products Co.

C. P. Firestone has been elected temporary chairman of the Firestone American Legion Post, Akron.

The Star Rubber Co., Akron, has authorized an increase in capitalization from $1,200,000 to $4,000,000, of which $1,500,000 will be eight per cent preferred and the balance common stock.

The Lambert Tire & Rubber Co., Akron, has elected the following officers: Henry M. Lambert, president; Judge Arthur Langguth, first vice-president and chairman of board of directors; J. W. Coyle, second vice-president; Porter E. Ramsey, director in charge of production, and John Hausam, secretary-treasurer and director in charge of Akron factory.

The H. B. Bixler Co. has been organized at Akron, Ohio, to supply engineering service to manufacturers in supervising processes and testing raw materials and finished products as well as in erecting plants and installing equipment. Plans are completed for erecting a two-story building, 80 by 300 feet, in which a complete modern rubber factory will be installed where all necessary machinery and new processes may be tested on a commercial scale. It will include a chemical and physical laboratory.

Makers of rubber-working machinery will be able to develop their machines and to demonstrate them under operating conditions. Manufacturers of rubber goods may use the plant while their own are under construction, and inventors may find the equipment to develop their ideas. A temporary laboratory, 47 by 80 feet, has already been put up and is handling work. H. B. Bixler is manager of the mechanical and electrical division, M. L. Allord of process and production work, and H. C. Roller of the technical laboratories.

The India Tire & Rubber Co., Akron and Mogadore, Ohio, expects to double its production of tires this year. It is adding more space to the present plant and will soon break ground for its new factory building, to be completed before the end of the year.

The Rubber Engineering Co., Akron, has removed from 325 Ohio Building to 46 South Broadway. On account of increased business, it was necessary for the company to secure larger quarters in order to improve its service to its customers.

A team to play the game of lacrosse will be formed among employes of The Goodyear Tire & Rubber Co., Akron, this year. This game is played with a hard rubber ball and specially constructed racquets.

The Amazon Rubber Co., Akron, has elected the following officers for the ensuing year: President, Dr. E. E. Quirk; vice-president, Frank B. Burch; treasurer, Walter Herberich; secretary and assistant treasurer, George Hupp. The directors include Messrs. Quirk, Burch, and Hupp, besides Gus Burkhardt, Albert Kroehle, W. A. Boesche, M. D. Kuhlke, and J. A. Berke.

Managers and salesmen of the Amazon company held a convention in Akron March 15-17, concluding with a banquet at the Akron City Club. The speakers included Edward S. Babcox, the newly elected vice-president of The Akron Advertising Agency Co.

The Avalon Rubber Manufacturing Co., Akron, has increased its capitalization from $200,000 to $1,500,000, and elected the following officers: J. Fred Hower, president and general manager; L. K. Hower, vice-president and factory manager; C. A. Carlton, secretary; and C. E. Siegfried, treasurer. These, with W. S. Salisbury, George Landis, and I. W. Maibach, constitute the board of directors.

The company expects to have its new tire plant at Sterling, Ohio, in operation by June 1. The Barberton plant will continue to handle mechanical goods and reclaiming.

The Columbia Tire & Rubber Co., Columbiana, Ohio, has elected the following officers: G. W. Henne, president; W. G. Henne, vice-president and general manager; Baird Broomhall, secretary; W. F. Henne, treasurer; directors—W. B. Martin, F. M. Bushnell, L. C. Chase, E. O. Townsend, and J. C. Henne.

The company's plant at Mansfield, Ohio, is to be known as plant No. 1 and that at Columbiana as No. 2.

B. C. Wilson, formerly of the Martin V. Kelley Advertising Agency, Toledo, and the Miller Rubber Co. in Akron, has joined the Akron Advertising Co., Akron, Ohio.

C. A. Damen, of the sales force of L. H. Butcher Co., Inc., New York City and San Francisco, dealer in colors and chemicals for the rubber trade, has been assigned to the Akron office, succeeding George H. Jacobs, resigned.

MISCELLANEOUS OHIO NOTES.

J. W. Blaser has been elected treasurer and director of sales for The Rubber Products Co., Barberton, Ohio.

W. S. Dellett succeeds Edward S. Babcox, resigned, as sales manager of the same company.

The National Tire & Rubber Co., East Palestine, Ohio, has reorganized its financial plan and will issue preferred stock to the amount of $1,000,000 in addition to 75,000 shares of no-par common stock. The present capitalization is $1,000,000. The officers are: C. I. Merwin, president; S. L. Warner, vice-president and general manager; R. B. Taggart, treasurer, and C. W. Helman, secretary.

The W. F. Gammeter Co., Cadiz, Ohio, is planning to build a new factory, 80 by 240 feet, to take care of its increasing business, and a foundry for making semi-steel castings, in order to insure always having a supply of shell heads.

The Dayton Rubber Manufacturing Co., Dayton, Ohio, has increased its capital to $10,000,000 of 7 per cent cumulative preferred stock, par $100 per share, and 100,000 shares of common stock without par value. The additional working capital obtained from the underwriting of this stock, of which a considerable amount has already been secured, will be used in building a large addition to the present plant and for the installation of additional equipment. The new building will have approximately 100,000 square feet of floor space and will be all on one floor with a ceiling 30 feet high containing extensive skylights. This addition will be completed and machinery installed by July next.

The company will specialize in both cord and fabric pneumatic tires during 1920, in addition to its "Dayton Airless."

The officers and directors of the company are: John A. MacMillan, president; C. E. Heiser, vice-president; C. E. Hooven, secretary and treasurer; William R. Craven, Walter L. Kuhns, and A. O. Eberhart, directors.

F. N. Hammond has been appointed special representative of the sales department of The Portage Rubber Co., Barberton, Ohio.

The J. W. P. Tire Co., 952 Valley street, Dayton, Ohio, incorporated in July, 1919, built and sold its first tire in the latter part of the following September and has now ordered additional equipment for delivery within 60 days with which it hopes to be turning out 200 tires daily within six months.

The Reynolds Machine Co., Massillon, Ohio, will add a tire mold plant to its present equipment. No foundry will be erected before next year, but additional floor space will be provided for boring mills and other machinery, which have already been purchased to the extent of more than $50,000. One mill has already been installed and several more are expected for delivery May 15.

The officers of the company are: F. C. Snyder, president; E. H. Birney, vice-president, and O. F. Binford, secretary-treasurer. The company has increased its capital stock from $200,000 to $500,000 to provide for the above expansion.

The Knox Tire & Rubber Co., Mt. Vernon, Ohio, has begun work on its new factory, ground having been broken on January 3, with appropriate ceremonies. B. E. Frantz is president.

The Allsteel Ridewell Tire & Rubber Co., 513 Lindsey Building, Dayton, Ohio, has purchased a factory site of 34 acres on the Baltimore & Ohio railroad and the Miami river, and is having plans and specifications prepared for a three-story and basement factory with three wings. This will be built of structural steel with brick facing and have 125,000 square feet of floor space. The company will manufacture a patented cord tire to be called the "Artyr," besides inner tubes and battery jars.

A. Huetter.

The president of the concern is A. Huetter who, in the summer of 1918, was elected vice-president and general manager of the Premier Rubber & Insulation Co., Dayton, previous to which he was for two years the head of the Bakelite department of the Dayton Engineering Laboratories Co.

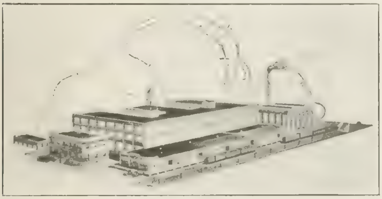
Innis, Speiden & Co., Inc., New York City, announce the removal of its branch in Cleveland, Ohio, from 641 Long avenue to 1913 Orange avenue on April 1, where a full line of chemicals for the rubber trade will be carried.

THE ERIE TIRE & RUBBER CO.

An enviable record of accomplishments is that made by The Erie Tire & Rubber Co., Sandusky, Ohio. This company was organized at Cleveland, Ohio, in March, 1919. Within six months their securities were fully sold, and the following November the factory began the manufacture of cord tires and inner tubes.

The officers of the company are: Peter F. Wills, president and general manager; H. H. Forrest, vice-president and general superintendent; F. W. Hildebrand, secretary, and H. M. Learned, sales manager.

The company's plant at Sandusky is being enlarged by the addition of new buildings now under construction, which will increase the capacity of the plant to 1,500 cord tires a day. The manufacturing policy of the company is to concentrate output exclusively on cord tires and tubes.



Plant of The Erie Tire & Rubber Co.

Appreciating that the realization of the plan to produce a strictly first-class product depends, in large degree, on able and efficient workmen, every effort is being made by the management to enhance that efficiency in ways that will contribute to the contentment of the operating force. The welfare activities are planned on the latest ideas and include a medical department under the direction of a physician, recreation grounds and a cafeteria. Special attention has been given to housing conditions, and several modern homes have been erected near the factory.

Through August, 1919, Trinidad and Tobago had shipped 24,673 pounds of rubber, as compared with 18,809 pounds for the same period in 1918, 12,102 pounds in 1917 and 5,063 pounds in 1916.

DIRECTOR OF GOODRICH MECHANICAL SALES.

Clarence Edwards Cook, director general of mechanical sales for The B. F. Goodrich Co., Akron, Ohio, is well fitted for this important position by long and varied experience with the Goodrich organization. Mr. Cook was born in Cleveland, Ohio, and received his education in the grammar and high schools of that city, graduating in 1895. That year he entered the freight office of the Lake Shore & Michigan Southern Railway as a clerk, where he remained four years. Attracted by the rubber industry, he was in the employ of The B. F. Goodrich Co. for two years, but returned to the railroad in 1901 for another year. In 1902 he went to the People's Hard Rubber Co., and the following year took a position as traveling salesman in Ohio, Indiana and Kentucky for the Gutta Percha & Rubber Manufacturing Co., New York City. In 1905 he accepted a traveling position with The B. F. Goodrich Co., and five years later found him Pacific Coast manager. From this position in 1917 he was promoted to the post of director of branch operations in charge of 120 branches and stores selling Goodrich products throughout the country. On June 1, 1919, he was again advanced to director of mechanical sales, which position he now holds.

C. E. Cook.

Mr. Cook has an extensive acquaintance in the rubber trade and elsewhere. He is a thirty-second degree Mason and Shriner.

MID-WESTERN NOTES.

By Our Regular Correspondent.

The Kokomo Rubber Co., Kokomo, Indiana, is one of the oldest industrial organizations of its kind. It made the first pneumatic automobile tires in the United States, and since the days of the high-wheeled bicycle it has supplied the bicycle trade with tires. The original pneumatic automobile tires are still part of the equipment of the Elwood Haynes' first American automobile, a famous industrial landmark on exhibit at the Smithsonian Institute, Washington, D. C.

J. W. Culver has been appointed manager of the central district offices and warehouse of The Federal Rubber Co. of Illinois, Cudahy, Wisconsin, with headquarters at 1434 Michigan avenue, Chicago, Illinois. He was formerly manager of the company's mechanical rubber goods department.

E. T. Fisher has been appointed manager of the Denver, Colorado, branch of The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio.

C. A. Jessup, formerly manager of the St. Louis, Missouri, branch of the Kelly-Springfield Tire Co., New York City, has been appointed manager of the company's branch at 294 Jefferson avenue, Detroit, Michigan.

A new building for the Detroit branch is being erected at the corner of Cass avenue and Antoinette street.

The Yarnall-Waring Co., Philadelphia, Pennsylvania, manufacturer of "Yarway" power plant devices, has opened a branch office in the Builders and Traders' Exchange, Penobscot Building, Detroit, Michigan, in charge of Walter G. Heacock, branch manager.

The Portage Rubber Co., Barberton, Ohio, has opened a branch at 450 Jackson street, Milwaukee, Wisconsin, to take care of increasing business in that territory. P. S. Manley has been appointed branch manager and six salesmen will work from this center.

The Mason Tire & Rubber Co. of New York, Inc., 450 Jackson street, Milwaukee, Wisconsin, has been granted a Wisconsin

licence to do business as a foreign corporation. This is a branch of the selling organization of The Mason Tire & Rubber Co., Kent, Ohio.

Packard Tire Stores, Inc., 436 Milwaukee street, Milwaukee, Wisconsin, has increased its capital stock from $50,000 to $100,000. It distributes McClaren tires, J. & D. brand, in Iowa, Wisconsin, and the upper peninsula of Michigan. It has one branch in Des Moines, Iowa. H. A. Packard is president.

The Tomah Rubber Corp., 176-182 Sixteenth street, Milwaukee, Wisconsin, has been organized as a preliminary company to develop a number of patents in tires and tubes, including a patent valve and a puncture-proof inner tire. The officers are: Leo Hofmeister, president and treasurer; Ray W. Slater, secretary; John R. Matthews, vice-president.

If this development work proves satisfactory, a new company called Allenton Rubber Mills will be organized and a three-story factory office, 96 by 96 feet, will be built at Allenton, Wisconsin, as soon as weather conditions permit. A site has already been purchased.

The Tomah Rubber Corp. is associated with the North Star Oil & Rubber Corp., 176 Sixteenth street, Milwaukee, Wisconsin, as are also the Sheboygan Oil & Rubber Corp., Sheboygan, Wisconsin, the Fond du Lac Oil & Rubber Corp., Fond du Lac, Wisconsin, and the Multi-Products Co., Milwaukee, Wisconsin.

The Otto Tire & Rubber Co., 208-210 Upper Fifth street, Evansville, Indiana, incorporated in December, 1919, has purchased several pieces of property on Sycamore street in order to remodel its vulcanizing department and enlarge its Gates half-sole and Maxotire department. It expects to be in full operation by May 1, confining its business to tires and accessories. H. J. Otto is president and general manager, G. H. Bippus treasurer and A. J. Hoffman secretary.

The Kansas City Tire & Rubber Corp., formerly of Kansas City, Missouri, was placed in the hands of receivers on May 24, 1919, on application of certain stockholders for the protection of their interests. In July, P. E. Werner, who organized the company, was appointed manager by the receivers to straighten out the affairs of the concern. About the middle of October the court granted permission to operate the factory at Kansas City, Kansas, manufacturing fabric tires. In December certain creditor banks applied for the sale of the property, but were refused by the judge at a hearing held on December 29. It is probable that operation will be continued by the receivers until a satisfactory reorganization can be accomplished. Meanwhile the factory at Kansas City, Kansas, is being operated day and night with two shifts of workmen, each shift working 8½ hours. Mail should be addressed to the general office at Fourth and Central streets, Kansas City, Kansas. The company owns a second factory at Chester, West Virginia, which has been rented.

The Two-in-One Tire Co., 418-420 Bridge street, N. W., Grand Rapids, Michigan, which operated its reliner business under the name of the National Tire & Reliner Co., has increased its capitalization to $675,000 and changed its name to First National Tire & Reliner Co. The officers are: R. Roden, president; I. Warsaw, secretary; A. J. Gorney, treasurer and general manager.

The Council Rubber & Tire Co., Broadway and Main street, Council Bluffs, Iowa, incorporated last December, will build a factory for the manufacture of mechanical rubber goods, pneumatic and solid tires and inner tubes, and the reclaiming of rubber goods. W. R. Blowers, president of the company, has been in the rubber business over 30 years. The other officers include F. A. Nabb, vice-president; William E. Hyland, secretary, and Elmer E. Weberg, treasurer. The authorized capital of the concern is $1,500,000.

The Madison Tire & Rubber Co., Inc., New York City and Buffalo, New York, has opened a branch for the sale of its tires and tubes at 1606 South Michigan avenue, Chicago, Illinois, in charge of John H. Jones, Jr., and John M. Erickson.

The Burlock Rubber Clothing Co., 297 Third street, Milwaukee, Wisconsin, recently incorporated at $250,000, for the purpose of rubberizing and manufacturing leatherette and suede coats as well as a general line of raincoats, is building a rubberizing plant at Wausau, Wisconsin, which will later be the company's headquarters.

The Quality Tire & Rubber Co., Anderson, Indiana, and the Long-Wear Rubber Co., Elyria, Ohio, which has changed its name to The Long-Wear Tire & Rubber Co., have arranged to consolidate under the last name. The capital of the Quality company was $750,000 and of the Long-Wear company, $500,000. The new concern is capitalized at $5,000,000, divided into $700,000 preferred and balance in common stock. General offices will be maintained at Anderson, Indiana. Frank W. O'Brien is general manager. The Elyria plant will be enlarged later by an addition for the building of cord tires.

The International India Rubber Corp., South Bend, Indiana, has increased its capital stock from $1,000,000 to $2,500,000 to take care of its increased business. The present plant is operating both day and night in the effort to increase production until the new plant additions under construction can be put into operation.

The company has promoted its Pacific Coast representative, C. H. Mayer, to the position of assistant sales manager at the South Bend office.

The Standard Four Tire Co., Keokuk, Iowa, maintains a branch at 245 North Penn street, Indianapolis, Indiana.

The Jostam Manufacturing Co., 1036 Montana street, Chicago, Illinois, has made a special arrangement with The B. F. Goodrich Rubber Co., Akron, Ohio, whereby it becomes the distributer of the Goodrich recoil pads known as "Akron," "Norka," and "H. R. B." The first two are slip-on pads and the last is the silver pattern pad.

The Brunswick-Balke-Collender Co., Chicago, Illinois, has contracted for additional equipment and improved processes to be used in its new factory at Muskegon, Michigan, which adds at least $250,000 to the estimated $1,500,000. Housing accommodations for employes are being made as well.

The Pan-American Rubber Co., Watertown, Wisconsin, has elected the following officers and directors: Max G. Kusel, president; Charles Christman, vice-president; O. C. Wertheimer, secretary and treasurer; directors—the above together with A. F. Mayer and Frederick Saxmann.

The Dryden Rubber Co., 1014 South Kildare avenue, Chicago, Illinois, is building a new power plant and a new factory building 180 by 70 feet, two stories, for the exclusive manufacture of inner tubes. Both are of brick, concrete, and steel construction. The company reports sales greatly increased over the corresponding period of last year.

The Latex Tire & Rubber Co., Fond du Lac, Wisconsin, organized last May, has already put up the first unit of its factory, a two-story building, 50 feet by 150, with a capacity of 300 tires and 700 tubes a day, on the shores of Lake Winnebago, with good railroad connections. The company expects to be manufacturing tires and tubes within a few weeks. It will specialize in the Latex Non-Skid and Ribbed Tread tires and the Lambright cushion tire.

The officers of the company are: F. S. Dannenberg, president and general manager; J. T. Brofka, vice-president; J. T. Jones, secretary and sales manager; Orlando J. Koll, treasurer. Grant Lambright, for many years with The B. F. Goodrich Co., is general superintendent, and D. J. T. Kennedy is assistant superintendent in charge of publicity.

Rub-Tex Products, Inc., 454 Lemcke Annex, Indianapolis, Indiana, has recently been incorporated to make mechanical rubber goods from used and discarded automobile tires; also

rubber heels and fiber soles. Edwin H. Emrick is president and Scott C. Legge treasurer.

WESTERN MANAGER, GLOBE RUBBER TIRE MANUFACTURING CO.

R. B. Tracy.

Another seasoned executive was added to the staff of the Globe Rubber Tire Manufacturing Co., when R. B. Tracy recently assumed the duties of western manager, following more than fifteen years' association with the Michelin Tire Co.

Mr. Tracy's connection with the tire industry dates back about twenty years when he became connected with the Pope Manufacturing Co., Hartford, Connecticut. Upon joining the Michelin forces he started as manager of the Cleveland, Ohio, branch. Four years later he was promoted to management of the Chicago branch, which included supervision over the Minneapolis, St. Louis, Des Moines, Cleveland and Kansas City branches. In 1915 he was appointed factory representative, with all branches west of Philadelphia under his direction.

Mr. Tracy has an extensive acquaintance and many friends throughout the Middle West that should prove valuable assets in promoting the sale of Globe tires in that territory.

MID-WEST RUBBER MANUFACTURERS' ASSOCIATION.

The March meeting of the Mid-West Rubber Manufacturers' Association was held in Chicago, Illinois, March 9, at the Chicago Athletic Association, and was the most largely attended of any of these monthly meetings. Fifty-one members were present and the opinion was voiced by all that the gatherings of the Association were of increasing interest and most beneficial.

John T. Christie, president of the Association, called on a number of the members to express themselves regarding trade conditions for the benefit of those present.

An incident of the meeting that awakened enthusiasm was the presentation of a handsome silver loving cup to John W. Maguire, vice-president and general manager of The Portage Rubber Co., Barberton, Ohio, and the first president of the Mid-West Association, in recognition of his services in organizing and guiding the Association through its first year.

Presented to John W. Maguire by Members of the Mid-West Rubber Manufacturers' Association, February 11, 1920.

It had been intended to present the cup at the February meeting, but Mr. Maguire had been unable to be present.

The presentation speech was made by Fred J. Horn, Akron representative of Fred Stern & Co., New York City, who spoke of the great need of a center for rubber activities in the mid-western states and the satisfactory manner in which Mr. Maguire had succeeded in anticipating that necessity.

Mr. Maguire responded to what had come as a total surprise to him, with words of thanks to the donors. He told of how a few of the manufacturers had organized in January, 1919, the association which now gave promise of a successful career, at the same time disclaiming any special credit for himself. His efforts, assisted by those associated with him, were to meet a situation that confronted them. Nevertheless, he was more than grateful to his friends who had thought his efforts worthy of this handsome testimonial.

During the meeting it was decided to create the office of second vice-president and the dual office of general manager and secretary. W. W. Wuchter, president of the Nebraska Tire & Rubber Co., who had been serving as secretary, was elected second vice-president, and H. S. Vorhis general manager and secretary.

The following new members were elected:

REGULAR MEMBERS.

Black Hawk Tire & Rubber Co., Des Moines, Iowa.
Century Rubber Works, Chicago, Illinois.
Johnstone Tire & Rubber Co., La Porte, Indiana.
The Overland Tire & Rubber Co., Omaha, Nebraska.
Surety Tire & Rubber Co., St. Louis, Missouri.

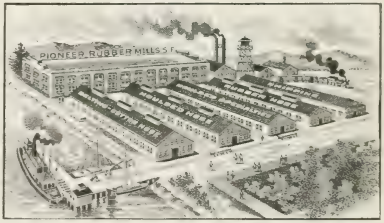
ASSOCIATED MEMBERS.

Duffy & Sears, New York City.
W. E. Byles, New York City.
Gove & French, New York City.
Bennett Day & Co., New York City.
The Rex-Hide Manufacturing Co., East Brady, Pennsylvania.

THE RUBBER TRADE ON THE PACIFIC COAST.

A PIONEER CALIFORNIA RUBBER FACTORY.

The Pioneer Rubber Mills, the name assumed by the Bowers Rubber Works, is greatly increasing its plant at Pittsburg in Contra Costa County, California. First started by W. F. Bowers forty years ago as the Pacific Coast branch of the Gutta Percha & Rubber Manufacturing Co., as W. F. Bowers & Co., then as the Bowers Rubber Co. and the Bowers Rubber Works, it has taken a leading part in developing the rubber industry of the Pacific coast. It was the first company to import crude rubber directly into California and still keeps up the practice by drawing the raw material from the rubber plantations of the East Indies straight to its wharves at Pittsburg.



The Pioneer Rubber Mills, Pittsburg, California.

The plant covers about twenty acres of ground and a good sized town near it houses its large working forces. The company devotes its attention to mechanical rubber goods such as "Skookum" piston rod packing, "Copper Queen" rubber transmission belting, "Sunset" elevator and conveyor belting, "Owl" pneumatic hose and "Victor" fire hose.

All compounding, mixing, and working up of the crude rubber are done at the Pittsburg plant. There the company is now building for the reclaiming plant a two-story reinforced concrete building, covering 50 feet by 115. It plans to increase and expand its mechanical rubber capacity to more than double its present capacity, being driven to this by the fact that for three

years past the plant has been operating to full capacity, twenty-four hours a day, in the effort to meet the growing demand, domestic and foreign, for the company's wares.

The fabric used by the Pioneer Rubber Mills is made from California long-staple cotton, grown in the Imperial valley and ginned and spun in California. Almost all of the cotton duck used is woven on the company's own looms.

LOS ANGELES NOTES.

W. A. Messick, Los Angeles, has applied for a patent on a pneumatic rubber cushion for the top of crutches; also for one on a similar cushion for butt ends of rifles and shotguns.[1]

Harry H. Anderson, Los Angeles, who, though still in his early twenties, has attained prominence in the tire industry, has been made sales manager for Hess & Hackett, distributers of Oldfield tires.

Frank R. Carroll, former Los Angeles branch manager and later district manager of The B. F. Goodrich Rubber Co., has been appointed vice-chairman of the board of directors of the Yokohama Rubber Co., Limited, the Japanese subsidiary of the Goodrich company.

In the financing of the new Coast Tire & Rubber Companies Securities, a $1,000,000 California corporation, an inducement is offered prospective stockholders of 15 per cent discount on tires and tubes, besides 8 per cent dividend on their investment. C. L. Stackhouse, 327 Douglas Building, Los Angeles, is district manager.

Charles W. Seiberling, brother of Frank A. Seiberling, president of The Goodyear Tire & Rubber Co., Akron, Ohio, was recently in Los Angeles with the company's mechanical engineer, W. C. State, and will plan to establish at the company's plant now being built in Los Angeles a recreation department that may even surpass that strong feature of the parent works in Ohio.

The Huntington Rubber Co., Los Angeles, has installed equipment for salvaging not only solid tires for trucks, but also giant pneumatics up to ten inches, such as are used on the heavy passenger stages and the freight motor cars on various routes between Seattle and San Diego. Up to recently the tire wastage on stage lines meant a serious loss, but as means have been found to restore old tires to almost maximum efficiency at about a third the cost of new ones, the transportation companies through this saving are now in a better position to offset the general rise in the cost of labor and materials.

Giant pneumatic tires are gradually supplanting heavy solid tires on motor stages that run between San Diego and San Francisco, California. The fine roads and the temperate climate are, of course, favoring factors for big pneumatics. Fully 500 cars, carrying on an average 10,000 people, leave the Union Stage Terminal in Los Angeles daily, and the extension of the stage transportation service as far north as the Canadian border is contemplated.

John F. Scanlon, advertising manager of the United States Compression Inner Tube Co., Tulsa, Oklahoma, was given a dinner recently by his Los Angeles newspaper friends at the Hotel Alexandria.

Sufficient headway has been made in the construction of the Goodyear Tire & Rubber Co. plant in Los Angeles, to warrant the projectors in saying that the factory, which will employ 10,000 workers at full capacity, will start manufacturing by June 1.

A new building is about to be erected by the J. B. Wood Tire & Rubber Co. at Third street and Central avenue, Los Angeles, as a distributing station for Hewitt tires, tubes, and mechanical rubber goods, the sale of which the Wood concern controls in Southern Califoria, Arizona, and Western Texas.

[1] The use of rubber in recoil pads is by no means new. Those on the market are as a rule solid rubber or contain sponge rubber for extra resilience. Nor is the pneumatic pad a novelty. In THE INDIA RUBBER WORLD for March 10, 1898, page 163, is a description and illustration of "Winters' Pneumatic Recoil Pad," which was manufactured by J. R. Winters, Clinton, Missouri.

The Los Angeles Horseshoe Tire Co., of which Charles Daley is manager, and which was recently appointed by the Pacific Rubber Co. as general Los Angeles distributer of Horseshoe tires and tubes, has been obliged, through increase in business, to move into larger quarters at 1037 South Figuerra street.

Dr. P. J. S. Cramer, of Amsterdam, Holland, the eminent authority on rubber botany, has been touring in the United States. He gave two lectures recently in Los Angeles and it is likely he will speak at several American universities before returning to Europe.

The Pacific Coast branch of the Standard Four Tire Co., Keokuk, Iowa, is at 342 West Pico street, Los Angeles.

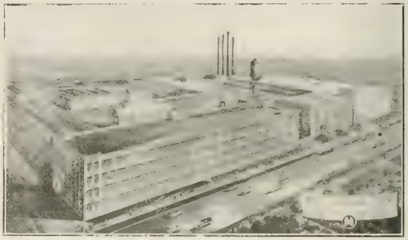
SAN FRANCISCO NOTES.

The Michelin Tire Co. of California, 1644 Pine street, San Francisco, has completed plans and specifications for its new warehouse on 12th street between Mission and Howard. The new building will be 120 by 100 feet, and have a private spur track, which is now under construction. In addition to providing storage space for the new Michelin disk wheel, which is just being placed on the market, there will be included in the structure a conference room and separate lunch rooms for men and women employes. The San Francisco organization is a subsidiary of the Michelin Tire Co., Milltown, New Jersey.

Weinstock-Nichols Co., San Francisco, one of the largest distributers of motor car accessories in California, has been appointed by the Hewitt Rubber Co. as distributers for Hewitt tires in the northern section of the state. This concern, which has branches in the leading cities of California, will distribute Hewitt tires exclusively.

CANADIAN DUNLOP COMPANY BUILDING NEW TIRE PLANT.

The Dunlop Tire & Rubber Goods Co., Limited, of Canada, with headquarters in Toronto and branches in fourteen other cities and towns in Canada, is building and equipping a new factory in Toronto for which $1,500,000 has been appropriated. The building, here represented, is being rushed to completion; it is 400 feet long, 80 feet wide, with four stories and basement. It will be devoted especially to the manufacture of Dunlop cord tires.



New Tire Plant of Canadian Dunlop in Toronto.

The expansion is part of the aggressive campaign started by the Dunlop Rubber Co., Limited, of England, which besides its close connection with the Dunlop companies in France, Italy, Japan and Australia has recently started Dunlop America Limited in the United States. The Canadian company, which shares in the formulas, processes, methods and investigations of the British and other Dunlop companies, announces that it will co-operate with and will be closely connected with the United States company.

Activities of The Rubber Association of America.

ASSOCIATION MEETINGS.

The regular monthly meetings of the Executive Committee, Mechanical Rubber Goods Manufacturers' Division, and the Executive Committee of the Tire Manufacturers' Division were omitted in March. The Executive Industrial Relations Committee met on March 12 and 13 and gave its attention to matters of general interest to rubber manufacturers. A report of the Committee's activities at this session was distributed to members of the Association through the medium of several communications dealing with the specific subjects.

REDUCTION IN CARLOAD FREIGHT RATES ON TIRES IN SOUTH.

In a recent decision of the Interstate Commerce Commission upon complaint as to the ratings applying on tires and tubes from points north of the Ohio and Potomac Rivers and west of the Mississippi River to southern points, the Commission directed that ratings be established to become effective on June 2, 1920, which shall provide third class rates, minimum carload weight of twenty thousand pounds on pneumatic tires in straight carloads, and third class minimum carload weight thirty thousand pounds on solid tires in straight carloads, mounted or unmounted, and on mixed carload shipments of pneumatic and solid tires and tubes third class rates, minimum carload weight thirty thousand pounds.

Heretofore, carload rates have not been in effect on shipments of tires and tubes to southern points and this reduction in the rates will result in a great saving in transportation charges on carload shipments to southern territory.

HEARINGS BEFORE THE INTERSTATE COMMERCE COMMISSION WITH RESPECT TO THE TRANSPORTATION ACT OF 1920.

The Interstate Commerce Commission held hearings in Washington on March 22 to 24, inclusive, at which proposals of the carriers, railroad security owners and the shipping public were received with a view to assisting the Commission in deciding the matter in which that feature of the Transportation Act of 1920 relating to the grouping of the carriers for rate-making purposes and the basis upon which the 5½ per cent guaranty return on the aggregate value of the railway properties shall be determined.

In view of the importance of this question, the settlement of which will determine the increase in transportation charges that will be necessary to furnish the carriers with sufficient revenue to conduct their business properly for the two years following September 1, 1920, the Traffic Department of The Rubber Association was represented at these hearings for the purpose of keeping in close touch with the situation.

Based upon the representations made to the Commission, it is felt that that body will decide that for present purposes the investment account of the carriers will be used for the basis for figuring the 5½ per cent return, and that the three existing freight classification territories will be used for grouping the carriers for rate-making purposes. The investment account will probably be subject to such corrections as the Commission may consider necessary.

UNSOUND NATIONAL ORGANIZATION SCHEMES.

New York, March 16, 1920.

To firm and affiliated members:

In discussing the work of the Industrial Relations Committee, it is found that practically every member of the committee has had numerous representatives of national organizations solicit their companies for financial support, and endorsement of various schemes. Many such propositions, although their objects may be laudable, do not have the organization or practical executives to carry on the work successfully. Many others do not have the merit of being sound, although a superficial examination might lead one to believe that they are worthy of support.

The committee believes that they can render a service to the members of the Rubber Association by investigating such organizations, and giving the members the benefit of their views on such matters. Therefore, if at any time, member companies desire to secure information in regard to any such organizations, if they will communicate with the general manager of the Rubber Association he will refer it to the Industrial Relations Committee for a report, and the committee will give their views on the matter.

Along this line, at the present time, a man named Albert St. Peter, from Pittsburgh, is endeavoring to build up a national organization for carrying on Americanization work. The committee has investigated this organization, and emphatically disapproves of the plan. The name of this organization is the National Institute for Americanization and Education. The committee believes that an organization such as this cannot carry on this work efficiently and they further believe that Mr. St. Peter himself has not demonstrated that he has executive ability to put through any such comprehensive plan, judging by his record in similar propositions with which he has been identified recently.

A. L. Viles, General Manager.

INDUSTRIAL RELATIONS.

New York, March 16, 1920.

To firm and affiliated members:

The Industrial Relations Committee wishes to call the attention of members to the bill recently enacted by the Kansas Legislature, for the establishment of Industrial Courts. A similar bill is now pending in the Legislature of the State of New Jersey, the number being Senate Bill 281.

The Kansas Industrial Relations Court law would seem to be, in the opinion of your committee, a justifiable experiment. Its successful working out can only be determined when proven by the test of time.

Your committee also wishes to impress on every member the importance of becoming thoroughly familiar with the report of the President's Second National Industrial Conference, which is now in the hands of the printer, and will be published within a few days. The Rubber Association will try to furnish each firm member with a copy of this report, as soon as it can be obtained from the printer; also copies of the Kansas and New Jersey bills.

The President's Industrial Conference, in all probability, will recommend the establishment of regional courts, and a national tribunal for the handling of all industrial disputes.

Your committee believes that there are some phases of this plan which should be given very serious consideration, since this is such a radical departure from present methods. Although some tribunals and courts may seem to offer a solution, theoretically, it would seem that there might be a possibility of such machinery creating more industrial disputes than we now have. Labor organizations would have everything to gain and nothing to lose, by getting a dispute before such a court, and once the machinery is established, there would be a great temptation on the part of certain people to use it. Further experiences show that the type of individual selected to serve in such positions is not the type who understands business or industrial problems, and in most cases people are selected because of their political affiliations rather than their practical knowledge of matters which come before them.

Your committee will discuss at its next meeting the report as a whole, and will furnish to member companies an expression of its opinion.

A. L. Viles, General Manager.

INDUSTRIAL RELATIONS—EMPLOYMENT.

New York, March 16, 1920.

To firm and affiliated members:

Replies to the letter of your committee on industrial relations, dated February 18, 1920, have been very gratifying. More than a hundred and twenty-five manufacturing members, large and small, have designated an executive or a specialist within their organization to supervise the work of industrial relations, and additional replies are being received daily.

It is the aim of your industrial relations committee to serve you intelligently whether your plant is large or small. In order to make the rubber industry foremost in industrial relations it is necessary that the members adopt a sound general policy which will fit local conditions.

As is well known, many of the larger plants in the rubber industry have industrial relations departments well established. While it is hoped that all plants can profit from the service offered, the committee, in outlining labor policies which have proved successful, has decided to begin at the beginning and proceed along practical lines as though each plant were just starting the study of industrial relations.

Assuming that a manufacturer has appointed an executive or specialist to supervise industrial relations work, experience indicates the next step to be the problem of employment.

Experience has shown that in any plant employing one hundred or more persons some one should be appointed on part time for smaller plants or full time for larger plants to specialize on the employment problem. He should report to the executive or specialist responsible for industrial relations. His duties should consist of supervision of employment, keeping records, hearing of all grievances, investigation of all discharges, care of all transferring and the study of causes of and remedies for labor turnover.

It is a mistake to place a mere clerk in such a position. A high-grade man with a naturally pleasant personality, good judgment, and plenty of back-bone should be appointed. Hiring and discharging by individual foremen are eliminated when the employment manager is introduced, and therefore diplomacy, good judgment and back-bone are needed in the employment manager.

The employment division must have a thorough knowledge of the company's needs for help, of the sources of supply and of approved methods of selection and placement so that each employe's experience and ability will be best utilized; should give the new employe general information as to shop regulations and as to the company's industrial policies, and should see that the employe receives, through the proper channels, such instruction as is needed to enable him to become familiar with his duties. The division should thereafter maintain an interest in the progress of the employe.

A great deal more might be written on the subject of employment. Your committee feels, however, that it is advisable for each plant to build up its own employment policies in accordance with local conditions. Your committee can make available to you plans and policies of employment departments which have been operating for some time in plants of various sizes and would prefer to answer any inquiries that may arise rather than to be considered as advisors.

A. L. Viles, General Manager.

QUESTIONNAIRE OF REPUBLICAN NATIONAL COMMITTEE ON INDUSTRIAL RELATIONS AND THE PROBLEMS OF CAPITAL AND LABOR.

New York, March 19, 1920.

To firm and affiliated members:

The Republican National Committee, through its Advisory Committee on Policies and Platform (with headquarters at 19 West 44th street, New York), has distributed a questionnaire on industrial relations and the problems of capital and labor, of which you have doubtless received a copy, as we understand it has been given wide distribution, particularly among manufacturers. If, however, you have not yet received a copy, we shall be very glad to arrange to have one forwarded immediately.

Because of the broad questions of policy and practice which are involved in the questionnaire and because the inquiry is of so searching a nature in the extent to which it goes into detail, it has been thought desirable to have the questionnaire given consideration by our members from the broader point of view of the entire industry, and to this end President Sawyer has requested the Executive Industrial Relations Committee to meet to give consideration to the specific questions presented therein with the view to developing information which, it is believed, will be helpful to members of the association in making their responses to the questionnaire. This committee is to meet next week, and it is expected that the information which may be developed by the Executive Industrial Relations Committee will be available to our members the latter part of the week.

It should be thoroughly understood that such suggestions or information as may emanate from the Executive Industrial Relations Committee, following its examination of the questionnaire, are only offered as possibly of help to our members in their study of it, but because the work of the committee may develop phases of the problems involved which are not apparent to individual members, it may be thought desirable by some of them to await advices from the Executive Industrial Relations Committee before disposing of the questionnaire.

If the suggestion presented in the foregoing is well thought of, we shall be very glad to have our members handle this matter accordingly, and further communications from the Executive Industrial Relations Committee will be transmitted to you as soon as possible. A. L. Viles, General Manager.

SPRING MEETING OF RUBBER CHEMISTS.

The Rubber Division of the American Chemical Society will hold its meeting at St. Louis, Missouri, April 14 and 15, in conjunction with the spring meeting of the society. The following program of subjects that are of vital interest to the trade should insure a large attendance.

1. Discussion of report of committee on "Physical Testing."
2. "Bromine Addition to Rubber," W. K. Lewis and Wm. H. McAdams.
3. "Relative Value of Shoddy in Mechanical Rubber," J. M. Bierer.
4. "Recovery of Volatile Solvents," W. K. Lewis.
5. "The Determination of True Free and True Combined Sulphur in Vulcanized Rubber," W. J. Kelly.
6. "Analytical Determination of the Coefficient of Vulcanization," S. W. Epstein.
7. "Small Amounts of Magnesia and Certain Organic Substances as Accelerators," G. D. Kratz and A. H. Flower.
8. "Obscuring Power of Pigments," W. K. Lewis.
9. "The Effect of Compounding Ingredients on the Physical Properties of Rubber" (lantern), C. O. North.
10. Symposium on the testing of pigments. Led by W. W. Evans.

Attention is called to the symposium on "Colloid Chemistry" by the Physical and Inorganic Division. Arrangement will be made, if possible, so that both these papers and those of the Rubber Division will be given at such times as not to conflict with each other.

The Dunlop Rubber Co. of Australasia, Limited, increased its profits in 1918 to £145,500 by £30,000 over the year before, and in its report for 1919 the profits increased to £177,000, which enabled the directors, after paying 10 per cent on the preferred shares to distribute 13 per cent to the ordinary shares and to lay away £53,330 in its reserve funds.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

At the annual meeting of the India Rubber Manufacturers' Association, J. T. Goudie, of the Leyland & Birmingham Rubber Co., Limited, vacated the chair after five years of strenuous occupancy, and Stuart A. Russell, of the Silvertown Rubber Co., Limited, was elected to the position; H. C. Coles, of Wm. Warne & Co., Limited, the vice-chairman, having declined the honor. Mr. Coles also gives up the position of vice-chairman and is succeeded by E. Healey, of W. A. Bates, Limited. After the chairman's remarks he was presented with a silver tea and coffee service which had been subscribed for by members of the Association.

Mr. Goudie referred to the fact that during his long chairmanship the membership of the Association had increased to such an extent that it now comprises 98 per cent of the production of the rubber industry in the United Kingdom. Reference was made to the restrictions on the import of American cotton duck while rubber goods containing it had been freely admitted. This anomaly, he stated, had now been removed. Mention was made of the recent increase in railway rates, the incidence of which he said would prove more of a hardship to rubber manufacturers than might be supposed by those who had only seen press references.

Emphasis was laid upon the need for an increased output from labor as now advocated by some of the more important labor leaders who are warning the workers not to be led away by revolutionary methods. A passing reference was made to a matter which is at present causing some controversy, namely, whether rubber garment makers are included in the five shillings per week advance granted to rubber workers by the Trade Council. This point has not yet been satisfactorily settled.

RUBBER SOLES.

As the price of boots keeps high, it is not surprising that the rubber composition soles are increasing in favor. A setback to their use has been that they have been largely barred by the bootmakers and repairers, and many people will not go to the trouble of putting them on for themselves. Moreover, they have not until recently been prominently on sale at a reasonable price. Now, however, permanent makes like the Wood-Milne and Macintosh can readily be bought in our towns at about *2s. 6d.* a pair and shoemakers are ready to nail them on to the leather sole. The firms mentioned make higher qualities, but it was bound to come about, as in the older rubber heel business, that considerable variations in quality are to be met with on sale. Some firms will not touch the cheaper qualities, while others recognize that there is a demand for them.

A new firm in this line is Synthetic Leather, Limited, of Embee Works, Shearbridge Road, Bradford. Mr. Marshall, late of Wood-Milne, is managing director, and only a high quality sole is made, to retail at about 5 shillings a pair.

Another one-time prominent official of Wood-Milne, Walter Wild, having now been demobilized, in company with one or two others, has started the Victor Rubber Co., Limited, at Leyland, and is specializing on rubber soles. Some premises which will shortly be vacated by the Monarch Rubber Co., Limited, of Gladen Street, Bradford Road, Manchester, are to be taken over by the adjoining Rivolite Co., Limited, in order to extend their rubber sole business.

THE PROOFING TRADE.

Despite a general increase in costs of production, this branch of the trade is very busy. Although all classes of proofing are in demand, especially for stripping purposes, there has been a great spurt in the cheaper lines at close competitive prices. One effect of this has been that the oil substitute manufacturers have had a much busier time than during the war. Let us hope that the results generally will prove satisfactory, though past history has many records showing defective work and complaints were much more rife in the lower cut lines of proofing than in the case of high-class proofing.

At the present time most of the retailers are having sales of mackintoshes and waterproofs at about half what is stated to be the usual price, i.e., the war-time price, and it is rather a nice question for the astute purchaser as to whether it is the better economy to buy a mackintosh of good quality two or three years old or a new one at the same price, but really of an inferior quality of proofing owing to the rise in cost of production. The case of weatherproofs is not on all fours because they do not depreciate in wearing value by keeping, but styles change, hence they are now being offered at a considerable reduction.

The oil proofing business shows a renewed activity, the new Ioco Works at Aumisland, near Glasgow, having taken up this branch energetically, although not many of our regular rubber proofers have touched it. This last remark applies also to the shower-proof garment trade. This class of proofing, which is largely concerned with wax, is mostly in the hands of finishers to the textile tenders in Lancaster and Yorkshire, as the calenders, etc., used in the finishing industry are readily adaptable to the wax proofing of cloth so largely used in India and other hot climates.

The name of Burberry's is well known to the sportsman and purchaser of expensive waterproofs, but details as to the production of the special cloth have in the past been known only to a few. Now, however, we are let into the secret by the acquisition by Messrs. Burberry of the cotton mills and business at Farnworth and Manchester of S. & J. Prestwick, who have been the makers and proofers of the Burberry clothes for about twenty years.

A new firm in the proofing trade is Carmac Rubber, Limited, of Huntershill Works, Bishopbriggs, Glasgow. The equipment is extensive in order to undertake proofing to the trade.

THE FEDERATED RUBBER GROWERS AND MANUFACTURERS LIMITED.

This company owns substantially the whole of the share capital of George Spencer-Moulton & Co., Limited, of Bradford-on-Avon and Wood-Milne, Limited, of Leyland, together with the Pundut Rubber Estates, and arrangements have also been entered into with Federated Textiles, Limited, to run a mill at Tittleborough near Rochdale so as to insure the companies having an adequate supply of canvas for their tire production. Rubber footwear is also to be made in a new mill in course of erection at Tittleborough so that the activities of the new company cover a wide range of the trade. For the purpose of financing these developments and for the acquisition of the control of the South African Rubber Manufacturing Co., Limited, as well as for general purposes, an issue of 500,000 six per cent cumulative preference shares of £1 each has been issued at par free of income tax up to 6 shillings in the pound sterling.

NEW MOTOR TAXES.

It is expected that the new tax for motor cars will be based on £1 per horse-power. This appears to have the support of the motor trade as the existing Treasury horse-power formula favors the smaller bore and longer stroke of the average British motor as compared with the larger and slower running American engine.

PEACHEY COLD CURE PROCESS.

S. J. Peachey was billed some months ago to give a paper before the Manchester Section of the Society of Chemical Industry, descriptive of his new process of cold curing rubber without the use of bisulphide of carbon and chloride of sulphur. It is now announced, however, that the paper which was to have been given on March 4, has been postponed to some unknown date, owing to certain circumstances which were not disclosed. I may say that the process is decidedly novel and of great prospective interest and the delay in publication may have something to do with the patent which I understand is being applied for.

GLUE IN RUBBER.

The use of pitch bodies in rubber seem to have been developed in America and now, according to the interesting article on the estimation of glue in rubber in the January number of The India Rubber World, glue must be added to the rubber analyst's worries, as it appears to have come to stay in American rubber mixings. I don't profess to be omniscient, and because I have not come across its use in rubber in England the statement must not be taken to mean that it is not already in regular use here. One thing against it, I imagine, is the rise in price which has occurred and the lower quality of the bone glue which is in the market to make up for the deficiency of hide glue.

In certain classes of goods glue and rubber come into close juxtaposition, but are not admixed. I notice that in "Crude Rubber and Compounding Ingredients," by Henry C. Pearson, it is stated that glue is used in bookbinder's cements, cheap frictions and cheap horse-cover compounds with rubber. This is interesting but presumably the "cheap" refers to pre-war days.

COLLOID CHEMISTRY.

This is not an inappropriate subject to come after glue, though the only thing I have to say here about this difficult matter is that it has been decided to found a professorship of colloid chemistry at Manchester University, the first professorship of its kind in the world. A sum of £25,000 is required for the endowment, of which I believe about one-half has been raised by cotton interests, Tootal Broadhurst Lee Co. being much to the fore in the matter. As far as local conversation goes, colloid chemistry means the chemistry of cotton, though readers of this journal have usually associated it with rubber, glue, resins, etc. It will be interesting to see to what extent the new professor will apply himself to problems connected with rubber.

ZINC SULPHIDE.

I was interested in a recent letter in The India Rubber World from a maker of zinc sulphide who stated that the works in California are ready to turn out much more if only the rubber trade would give the orders. That is the rub. Despite paragraphs in various rubber books extolling the virtues of zinc sulphide, the demand from the trade has hardly increased at all in the last thirty years, the total consumption being almost negligible, as rubber chemicals go in these days. Of course, in later years a good deal has been used in the compounded form of lithopone and it rather looks as if the extended use of lithopone is all against the employment of zinc sulphide to a greater extent, except in cases such as dental rubber where barytes would be quite inadmissible.

SLATE POWDER.

A company has been formed to market refuse Welsh slate in the form of a very fine powder for use in compounding in the rubber and other industries. Silicates such as fine white clays have certainly come into use in the rubber trade in the last few years to a greater extent than formerly and there may be a future for the new Welsh product.

William Boyd Stocker has become connected with Geo. Hankin & Co., 27 Mincing Lane, London, E. C. 3, in a responsible position. Mr. Stocker has been identified with the rubber, balata, and allied trades for a number of years.

FRENCH RUBBER ASSOCIATIONS.

The French rubber manufacturers have not formed a single large corporation like The Rubber Association of America, but have preferred to join a series of groups comprising those interested in each specialty. The following is a list of these associations, with their addresses:

Chambre Syndicale des Tissus et du Caoutchouc (fabrics and rubber), 8 rue Montesquieu, Paris.

Chambre Syndicale des Linoleums, Toiles Cuirs et Toiles Cirées (linoleums, artificial leathers, and waxed fabrics), 32 rue Ampère, Paris.

Syndicat de Toiles Circées et Produits Similaires (waxed fabrics and like products), 11 rue de Turbigo, Paris.

Syndicat des Appareils de Chirurgie (surgical appliances), 20 rue Serpente, Paris.

Syndicat des Acessoires de Chirurgie et d'Hygiène (surgical and hygienic accessories), 163 rue Saint Honoré, Paris.

Syndicat de Fournitures d'Usines (factory appliances), 163 rue Saint Honoré, Paris.

Chambre Syndicale des Vêtements en Caoutchouc et Imperméables (rubber clothing and waterproofs), 163 rue Saint Honoré, Paris.

Syndicat des Antidérapants (non-skid devices), 39 rue de Château Landon, Paris.

Syndicat de Caoutchouc et de Linoleum (rubber and linoleum), 18 rue Duphot, Paris.

Syndicat des Fabricants de Celluloid (celluloid products), 7 rue du Jong, Paris.

Syndicat des Planteurs de Caoutchouc de l'Indo-Chine (rubber planters), Saigon, French Indo-China.

Syndicat des Planteurs de Caoutchouc (rubber planters), 48 Place de Meer, Antwerp.

Syndicat des Ingénieurs, Chimistes, Chefs de Fabrication et Contremaitres de l'Industrie du Caoutchouc (union of engineers, chemists, factory heads and foremen in the rubber industry), 49 rue des Vinaigriers, Paris.

The most important associations are the Chambre Syndicale des Tissus et du Caoutchouc, of which Mr. Yung is president and which comprises all the great French manufacturers such as Michelin, Bergougnan, the Société Parisienne, the Société des Téléphones, etc., and the Syndicat des Planteurs de Caoutchouc de l'Indo-Chine.

THE RUBBER TRADE IN JAPAN.

By Our Regular Correspondent.

Among the many manufacturing industries which arose in Japan during the Great War, the rubber industry must be reckoned among the most promising. Before the war it had been developing gradually, but with the outbreak of hostilities the demand for Japanese rubber articles rapidly increased. Since then, too, the use of rubber goods has become more widespread throughout the Orient. Prior to the war South America, Canada, Australia, India, China and the South Sea Islands had been supplied with rubber articles of British or German make, but the opening of hostilities curtailed or altogether stopped these supplies. Consequently articles made in this country have come to be exported, especially balls, sheets, hose and toys. These articles had not before been extensively manufactured in Japan, but rubber manufacturers had to produce them to meet the home demand, and exportation followed as a natural consequence.

THE TOKIO RUBBER ASSOCIATION.

The first general meeting of this association was held on January 13, 1919, with many prominent officials in attendance, including the deputy of the Minister of Agriculture and Commerce. Since the establishment of the association a year ago its principal activities have been many and important.

On August 5 the officers' meeting was held at the office of the association, when it was decided to raise prices of general rubber manufactures by 20 per cent owing to high prices of naphtha, textiles and wages. But 20 per cent has not proved sufficient and urgent measures are required. Though it is difficult for all manufacturers to make uniform prices inasmuch as the prices must

vary according to the qualities of the goods, ball manufacturers are planning to fix prices uniformly.

A domestic exhibition in commemoration of peace was held at Ueno Park last summer. The Tokio Rubber Association exhibited products of the members, the Mitatsuchi Rubber Manufacturing Co., Nihon Rubber Co., Kyodo Rubber Co., and many other firms and dealers. These articles were well designed and nicely made to attract the attention of spectators, but unluckily the building took fire on August 21 and all exhibits were destroyed.

On May 22, the councillors' meeting was held, and regulations concerning condolences for deceased members were decided upon.

"The Rubber Times" (*"Gomujiho-Sha"*) was recently organized by about twenty officers of the Tokio Rubber Association. It will be published monthly as the official organ of the association to promote the mutual benefit of members. It is expected that the first number will be issued on January 5, 1920.

The general meeting and an appreciation ceremony to reward 124 faithful employes who have served one firm over ten years without interruption, was held on January 11, at the Seiyoken Hotel at Tsukiji, Tokio. Most of the veteran employes rewarded are employed by the Mitatsuchi Rubber Manufacturing Co., the Nihon Rubber Co., and the Meiji Rubber Factory, as they are the oldest firms in Tokio and in Japan. Some of the employes of the Mitatsuchi Company have served over thirty years without interruption.

JAPANESE JINRIKISHA TIRES IN SHANGHAI

According to an investigation by the Shanghai Chamber of Commerce, it was about 1903 that pneumatic jinrikisha tires appeared in that city for the first time. They were made by the Dunlop Rubber Co. (Far East), Limited. Until the Great War this company monopolized the business except for a few German imports made in 1912 by the Continental Caoutchouc & Gutta Percha Co. After the outbreak of the war, some Japanese tires were imported, and fierce competition ensued with the Dunlop tires, the result being that at present all jinrikisha tires in Shanghai are of Japanese make.

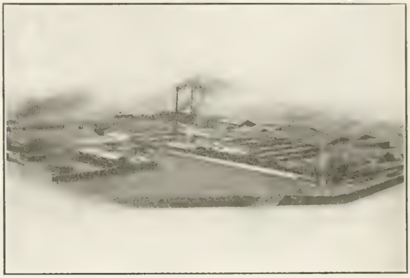
Exceptional conditions have rendered an extension of this business difficult and unremunerative, but now that special tires are being made for the Chinese trade, better results are hoped for. There is more rain in Shanghai than in Japan, the rainy season lasting about four months, from April to July, and shortening the life of tires.

Roads, except the principal thoroughfares, are mostly bad, and some are pebbled, so that tire wear is excessive. Neither owners nor pullers of jinrikishas keep tires in good repair. Jinrikishas are continually used during both day and night. A seven months' guaranty is required. If the tires are damaged within that time, they must be exchanged for new ones. Most tires are damaged within seven months owing to the conditions under which they are used, and the margin of profit is therefore very small.

JAPAN'S PIONEER INSULATED WIRE FACTORY.

In the production of rubber-covered wire for all electrical needs Japan is steadily forging to the front. One of the biggest factors in the trade in the Orient is the *Fujikura Densen Kabushiki Kaisha* (Fujikura Insulated Wire and Cable Co.), 922 Sendgaya-Machi, Tokio. This concern was started in a humble way in 1885 by the late Mr. Fujikura, the pioneer in insulated wire making in Japan. He foresaw that his progressive country would share largely in the rapid, world-wide expansion of electric lighting, telegraph, telephone, and allied industries and installed modern machinery, introduced up-to-date processes, and constantly enlarged his staff of men skilled in chemical and electrical research work. Much credit is also due T. Matsumoto, who succeeded Mr. Fujikura as president of the company, and to Kenzo Okada, known to many in the United States.

The concern adheres closely to the standards of the British Cable Makers' Association and the Japanese government to insure the maximum of efficiency in the products. Among the specialties manufactured is an ozone-proof vulcanized rubber cable designed to withstand the action of ozone, which even on



Fujikura Insulated Wire & Cable Co., Tokio, Japan.

the best rubber-insulated cables will slowly break down the dielectric coating when the gas is produced on the surface or the ends of the cables during the passage of high voltage currents.

Another product is the Fujikura patent okerite or minerite insulated wires and cables, said to be acid and flame proof, non-hygroscopic, unaffected by sea and mine water, requiring no lead covering, with high conductivity and low electrostatic capacity as well as being tough and pliable even below the freezing point.

FOREIGN CUSTOMS CHANGES.

CANADA.

Canadian duties levied on rubber imports from the United States are as follows: Rubber tires, tire repair kits, tire valves and stems, 42½ per cent ad valorem. Rubber manufactures, rubber engine packing, rubber mats, 42½ per cent. Asbestos manufactures, asbestos brake lining, 32½ per cent. The preferential rates, allowed for British goods, on rubber goods is 22½ per cent.

PORTUGAL.

Portugal now permits the exportation of motor cycles and motor cars, with their tires, to the Portuguese colonies.

BRAZIL.

Brazil proposes to change the existing duty of 15 per cent ad valorem on tires to one of 200 reis (11 cents) per kilogram on solid tires and 600 reis (32½ cents) per kilogram on pneumatic tires.

NEW ZEALAND.

New Zealand now admits free of duty the impregnated cardboard discs, with rubber patch attached, that are a part of vulcanizer outfits.

HUNGARY.

Hungary permits the importation of india rubber, gutta percha and "the goods thereof" without a previous license.

In 1918 the Dominican Republic imported rubber products to the value of $143,976, compared with $84,266 for 1917, the United States supplying goods worth $137,804 and $76,479 in the resepctive periods.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED FEBRUARY 3, 1920.

No. 1,329,398. Reinforced rubber washer for hose couplings. F. Hachmann, St. Louis, assignor of one-eighth to D. M. Hutchinson, Ferguson, both in Missouri.

1,329,463. Pneumatic tire construction. H. F. Maranville, assignor to the Firestone Tire & Rubber Co.—both of Akron, O.

1,329,512. Valve for inflating balloons and the like. H. A. Dodge, Essex Fells, and W. J. Leatherow, Newark, assignors to Howe-Baumann Balloon Co., Newark, both in New Jersey. (See The India Rubber World, March 1, 1920, page 366.)

1,329,558. Protected rubber packing. M. I. Strauss, Cleveland, O.

1,329,584. Balloon construction. F. De Marinis, Brooklyn, N. Y.

1,329,687. Water-hammock with pneumatic pillows. E. Underwood, Gary, Indiana.

1,329,776. Tire valve adapter. H. P. Kraft, Ridgewood, N. J.

1,329,777. Lined inflatable waterproof garment. M. Kriger, New York City.

1,329,954. Inner tube for pneumatic tires and process of manufacture. O. T. Bugg, Philadelphia, Pa.

ISSUED FEBRUARY 10, 1920.

1,330,061. Tire-retaining ring for clencher rims. W. H. Dillet, Ralston, Okla.

1,330,108. Safety tire valve. W. K. Bauhaus, Carpenteria, Calif.

1,330,222. Cushion wheel. M. Tibbetts, assignor to Packard Motor Car Co.—both of Detroit, Mich.

1,330,299. Bathing hat. J. B. Ballard, assignor to Revere Rubber Co.—both of Providence, Rhode Island.

1,330,329. Safety-valve for observation balloons. J. S. Maxwell, assignor to The Starr Piano Co.—both of Richmond, Ind.

1,330,552. Rubber shoe sole with attaching lip. A. T. Saunders, Chicopee, Mass., assignor to A. G. Spalding & Bros., Jersey City, N. J.

1,330,577. Dust cap for tire valve stems. R. E. Bloom, Brooklyn, N. Y.

1,330,633. Rubber tread for boots and shoes. S. Hilder, Glencarlyn, Va., assignor to F. Berenstein, Chelsea, Mass.

1,330,732. Reinforced pneumatic tire. J. C. Wise, Los Angeles, Calif.

1,330,756. Resilient tire. E. B. Brown, Los Angeles, Calif.

1,330,758. Demountable rim for tires. H. Guthrie, Chicago, Ill.

1,330,759. Pressure gage and pump connection for tire valves. W. P. Hammond, Passaic, N. J., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.

ISSUED FEBRUARY 17.

1,330,815. Sectional pneumatic tire. J. B. O'Connor and L. Tarwater, both of Kansas City, Mo.

1,330,973. Wear-resisting structure of rubber having granulated mineral masses embedded therein and the whole vulcanized to a self-supporting backing. G. P. Bartholomew, Essex Falls, N. J., assignor to American Abrasive Metals Co., New York City.

1,331,023. Inner tube for tires. T. L. Morton, New Orleans, La.

1,331,027. Combined corset and corset-waist, having elastic hip and shoulder portion. I. Roussin, Buenos Aires, Argentina.

1,331,042. Sanitary belt and bandage. E. Andrae, Edinburgh, Scotland.

1,331,060. Dust cap for valves of pneumatic tires. W. P. Hammond, Passaic, N. J., assignor to A. Schrader's Son, Inc., New York City. (Original application divided.)

1,331,142. Waterproof protector for ladies' hats. W. D. L. Busby, Clifton-upon-Dunsmore, England.

1,331,146. Tire vulcanizing mold. E. W. Fothergill, Hartford, assignor to Hartford Rubber Works Co.—both in Connecticut.

1,331,165. Hydrometer syringe. M. E. Moeller, Brooklyn, N. Y.

1,331,199. Rubber heel. R. I. Hill, assignor to The Hill Rubber Co.—both of Elyria, O.

1,331,347. Quick detachable combined dust and air cap for valve stems. J. M. McNamara, Clinton, Mass.

1,331,358. Resilient cushioned tire. J. Parrino, assignor of one-half to di Giralamo—both of Buffalo, N. Y.

1,331,374. Apparatus for washing eyes. G. C. Precerutti, Turin, Italy.

1,331,457. Garment supporter. J. H. Elliot, Rockford, Ill.

ISSUED FEBRUARY 24, 1920.

1,331,508. Water-tight container for use of bathers. D. R. Kolodny, Brooklyn, N. Y.

1,331,601. Respirator. R. Watanabe, Tokio, Japan.

1,331,606. Resilient tire. T. Widdop, Ogden, Utah.

1,331,855. Tire boot. E. M. Steel, Spokane, Wash.

1,331,917. Cast steel wheel with rim to accommodate rubber tires. A. Hargraves, assignor to The Firestone Steel Products Co.—both of Akron, O.

1,331,954. Anti-slipping attachment for ladders. C. J. Brown, River Falls, Wis.

1,332,121. Demountable rim for tires. L. Friedman, New York City.

1,332,149. Pneumatic tire. P. E. van Berendonck, assignor to Berendonck's Section Tyre Syndicate, Limited—both of Amsterdam, Netherlands.

ISSUED MARCH 3, 1920.

1,332,309. Puncture-proof inflatable inner tube for tires. P. A. Sawyer, Memphis, Tenn.

1,332,673. Pneumatic surf-mattress. H. B. Marshall, Long Beach, Calif.

1,332,721. Vehicle wheel combining pneumatic inner tubes and solid rubber tire. J. E. Harrigan, assignor to Eagle Puncture Proof Tire & Wheel Co., Inc.—both of New York City. (See The India Rubber World, April 1, 1919, page 369, and December 1, 1919, page 155.)

1,332,780. Reinforced balloon structure for airships and the like. R. H. Upson, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

1,332,816. Resilient tire. J. H. Douglass, Norfield, Miss.

ISSUED MARCH 9, 1920.

1,332,933. Pneumatic cushion. E. S. Sylvester, West New Brighton, N. Y., assignor to Rubber Regenerating Co., Naugatuck, Conn.

1,332,953. Pneumatic tire with plurality of interior air cells automatically inflated by means of check valves when air under pressure is admitted into tire. W. H. Richards, Knoxville, Tenn.

1,333,007. Artificial tooth with cushion of soft vulcanizing rubber. R. M. Withycombe, Sydney, New South Wales, Australia.

1,333,091. Valve for pneumatic tires. M. J. Payne, Staunton, assignor to The Payne Valve Corporation, Roanoke—both in Virginia.

1,333,196. Patch material for rubber articles. C. F. Young, Kansas City, Kans.

1,333,232. Demountable rim for tires. F. H. Van Loozen, Lakewood, O.

1,333,261. Teat cup for milking machines with suction nipple at lower end. B. A. Knowles, Azalia, Mich.

1,333,518. Demountable rim for tires. T. F. Ware, Salt Lake City, Utah.

1,333,549. Pressure gage for tires. H. Keynton, West Hoboken, N. J., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.

THE DOMINION OF CANADA.

ISSUED FEBRUARY 3, 1920.

196,739. Elastic fabric. C. Adams, East Rutherford, N. J., U. S. A.

196,869. Garment gage with elastic edges. H. W. Roswell, Seattle, Wash., U. S. A.

196,871. Armored pneumatic tire. J. V. Royal, Newton, Mass., U. S. A.

196,967. Armored pneumatic tire tube. W. H. Thompson, Marinette, assignor of one-third interest each to B. Brill and S. M. Kohn, Green Bay—all in Wisconsin, U. S. A.

ISSUED FEBRUARY 10, 1920.

197,041. Two-piece easily cleaned rubber mouthpiece for feeding bottles, held in position by stopper. F. R. Graham-Yooll, Leith, Scotland.

197,178. Dust cap for tire valves. The A. Schrader's Son, Inc., New York City, N. Y., assignee of W. P. Hammond, Passaic, N. J.—both in U. S. A.

ISSUED FEBRUARY 17, 1920.

197,232. Hose supporter. F. H. Childs, Stroud, Oklahoma, U. S. A.

197,364. Pneumatic tire. W. P. Gordon, Clarendon, Va., and T. B. Jacocks, Tarboro, N. C., assignee of one-half interest—both in the U. S. A.

ISSUED FEBRUARY 24, 1920.

197,400. Reinforced pneumatic tire. O. A. Kottenmann, St. Louis, Mo., U. S. A.

197,412. Split rim for tires. W. N. Booth, Detroit, Mich., U. S. A.

197,435. Rubber sponge enclosed in fabric casing. G. Fierheller, Toronto, Ont.

197,454. Expansible split rim for tires. J. H. M. Michon, Washington, D. C., U. S. A.

197,455. Expansible split rim for tires. J. H. M. Michon, Washington, D. C., U. S. A.

197,456. Collapsible split rim for tires. J. H. M. Michon, Washington, D. C., U. S. A.

197,461. Detachable rim for tires. H. Mote, 49A Pall Mall, County of London, England.

197,481. Waterproof catamenial bandage. S. D. Trumbo, Columbus, O., U. S. A.

197,530. Disk wheel for pneumatic tires, with means for fastening together the disks so that they rotate as a unit. Dunlop Rubber Co., Limited, Westminster, County of London, assignee of F. J. Keegan, Coventry, County of Warwick—both in England.

197,531. Metal vehicle wheel arranged for single or dual solid rubber tires. The Dunlop Rubber Co., Limited, Westminster, London, assignee of C. Macbeth, Birmingham, County of Warwick—both in England.

197,532. Solid rubber tire. The Dunlop Rubber Co., Limited, Westminster, London, assignee of H. C. Young, Birmingham, County of Warwick—both in England.

197,534. Demountable rim for tires. The Goodyear Tire & Rubber Co., Westminster, London, England, assignee of J. B. Atkins, Akron, Ohio, U. S. A.

197,557. Suspenders. The Resilia Manufacturing Co., Cambridge, Mass., assignee of H. T. Smith, Providence, R. I.—both in U. S. A.

197,561. Pressure gage for tires. A. Schrader's Son, Inc., New York City, assignee of J. A. Bowden, Los Angeles, Calif.—both in U. S. A.

197,579. Demountable rim for tires. W. Beeman and B. Palmer, co-inventors, assignors of one-half interest to E. S. Beeman—both of Laporte, Indiana, U. S. A.

THE UNITED KINGDOM.

ISSUED FEBRUARY 4, 1920.

135,874. Insulated electric cables. C. J. Beaver, Rangemoor Crescent Road, Hale, and E. A. Claremont, Broom Cottage, High Legh—both in Cheshire.

135,929. Solid rubber sectional tire. Dunlop Rubber Co., 14 Regent street, Westminster, and C. Macbeth, Para Mills, Aston Cross, Birmingham.

135,995. Rim for tires. W. J. Mellersh-Jackson, 28 Southampton Buildings, London. (Detroit Pressed Steel Co., 1800 Mount Elliott avenue, Detroit, Mich., U. S. A.)

136,068. Elastic book-marker. W. Horn, 132 Palewell Park, East Sheen, Surrey.

136,070. Elastic heel friction pad. J. A. Drechsler, 96 Budlong street, Hillsdale, Mich., U. S. A.

136,265. Resilient cushioned wheel. H. Wade, 111 Hatton Garden, London. (Morand Bros.—Martin Cushion Wheel Co., 818 South May street, Chicago, Ill., U. S. A. See The India Rubber World, November 1, 1918, page 88.)

Chemical Patents will be found on pages 427, 428. Machinery Patents on pages 431, 432.

ISSUED FEBRUARY 11, 1920.

[illegible]. Elastic [illegible]. E. W. Pattison, 51 Deansgate Arcade, Manchester. (Victory Corset Co., 20 Vesey street, New York City, U. S. A.)

136,410. Window-cleaning device. H. T. Girdlestone, 25 Glasshouse street, Regent street, London.

[illegible]. Glove with hooded portion held in place by elastic band. T. Hilton, Br[illegible]-Ala, Mottram Road, Matley, Stalybridge, Cheshire.

[illegible]. Respirator. El Conde de Ramirez de Arellano, Bachelor's Farm, Horsham, Sussex.

[illegible]. Billiard cues. W. F. Coward, 60 Dean street, South Shore, Blackpool, Lancashire.

[illegible]. Infant's rubber pants. A. E. White, 88 Chancery Lane, London. (I. B. Kleinert Rubber Co., 725 Broadway, New York City, U. S. A. See The India Rubber World, December 1, 1919, page 157, for illustrated description.)

[illegible]. Golf clubs with striking face of rubber between pieces of vulcanized fiber, etc., A. F. J. Percival, Golf Club House, Highcliffe, Castle Golf Club, Highcliffe, Hampshire.

[illegible]. Garter. R. Gorton, 143 Freeman street, Brookline, Massachusetts, U. S. A. (Not yet accepted.)

[illegible]. Garter. R. Gorton, 143 Freeman street, Brookline, Massachusetts, U. S. A. (Not yet accepted.)

ISSUED FEBRUARY 18, 1920.

136,916. Door mats composed of rubber rollers threaded on wires between metal scraper strips. G. Gibson, 17 St. Paul's Square, Bedford.

136,946. Cushioned spring wheels. E. Jacqmain and J. Kucharek, 19 Rue de la Plaine, Brussels.

ISSUED FEBRUARY 25, 1920.

137,066. Dust cap for tire valves. A. Schrader's Son, Inc., Brooklyn, N. Y., assignee of E. V. A. Myers, 82 Evergreen Place, East Orange, N. J.—both in U. S. A. (Not yet accepted.)

137,067. Dust cap for tire valves. A. Schrader's Son, Inc., Brooklyn, N. Y., assignee of E. V. A. Myers, 82 Evergreen Place, East Orange. N. J.—both in U. S. A. (Not yet accepted.)

[illegible]. Inhaler. V. Milan, 32 Via del Leoncino, Rome.

137,103. Pneumatic tires. E. H. Taylor, 92 Bennett's Lane, Smithills, Bolton, Lancashire.

137,139. Reinforced composite material in layers, containing rubber, etc. R. Russell, The Acres, Middleton, near Manchester.

137,140. Rubber cushion devices for vehicle doors. A. S. Cheston, Cheston, Widney Works, St. Paul's Square, Birmingham.

137,143. Metal-studded rubber soles and heels with leather insets. R. T. Hull, Haughton Hall, Denton, Lancashire, and B. Mellor, Mottram New Road, Hyde, Cheshire.

137,165. Powder puff case of rubber, etc. F. Mousley, Priest Bridge, Mortlake, London.

[illegible]. Collapsible rim for tires. J. H. Miskimen, Glendive, Montana, U. S. A.

ISSUED MARCH 3, 1920.

137,253. Abdominal belt. H. A. Monin, 53 rue Petit, St. Denis, Seine, France.

137,306. Pneumatic tire. H. S. Blynt, Yale, Oklahoma, U. S. A. (Not yet accepted.)

137,309. Rubber sole protector. R. G. Fabregas, 3 Plaza Galvany, Barcelona, Spain. (Not yet accepted.)

137,328. Tube for ethyl chloride, etc., with rubber-padded stopper. A. Schrader's Son, Inc., Brooklyn, N. Y., assignee of H. P. Kraft, 219 Godwin avenue, Ridgewood, N. J.—both in U. S. A. (Not yet accepted.)

137,331. [illegible] valve. A. B. Norwalk, 740 Riverside Drive, New York City, U. S. A. (Not yet accepted.)

137,389. Rubber pads for soles and heels. W. H. Phipps, 57 Wick Road, and W. T. Hooper, 71 Repton Road—both in Brislington, Bristol.

[illegible]. Golf-club handle with insertion of molded rubber beneath wrappings. J. S. Jones, Rosemont, Warbrick Hill Road, Blackpool.

THE FRENCH REPUBLIC.

PATENTS ISSUED, WITH DATES OF APPLICATION.

496,743. (March 8, 1919.) Valve for pneumatic tires. A. Schrader's Son, Inc.

[illegible]. (March 10, 1919.) Improvements in waterproofing materials and the process of manufacture. L. Kirschbraun.

496,788. ([illegible]) Parachute having pneumatic device. A. [illegible]

496,849. (March 11, 1919.) Improvements in solid rubber tires. The Dunlop Rubber Co., Limited.

497,069. Improved manometer for pneumatic tires. A. Schrader's Son, Inc.

497,375. (March 26, 1919.) Elastic fabric. Victory Corset Co., Inc.

497,964. (February 21, 1919.) Valve for pneumatic tires. C. Carenini.

498,074. (April [illegible], 1919.) Improvements in resilient wheels. M. W. Peck.

498,347. (September 19, 1917.) Rubber tip for canes, crutches, furniture, etc. M. Taritot, 29 rue Mogador, Paris.

498,410. (April 16, 1919.) Improvements in rubber heels. A. Bendoni et Cie.

498,697. (August 25, 1916.) Improvements in coverings for pneumatic tires. T. Duysens and R. Hustinx.

498,755. (April 29, 1919.) Improvements in wheels, especially those with pneumatic tires for automobiles. M. Kapferer.

498,767. (April 29, 1919.) Composition to plug automatically punctures in pneumatic tires. J. H. Jacobsen.

499,034. (May 6, 1919. Cap for valves of pneumatic tires. A. Schrader's Son, Inc.

499,337. (May 9, 1919.) Valve for pneumatic tires. A. Schrader's Son, Inc.

499,337. (May 9, 1919.) Valve for pneumatic tires. A. Schrader's Son, Inc.

499,413. (May 12, 1919.) Pneumatic wheel. G. C. M. J. Lentz.

GERMANY.

PATENTS ISSUED, WITH DATES OF APPLICATION.

320,204. (July 13, 1917.) Elastic tire. B. Iwanowsky, Mainz.

320,365. (April 7, 1916.) Pneumatic tire with reserve tubes. M. S. Stevenson, London, England.

320,723. (August 5, 1913.) Solid rubber tire. H. B. Clayson, Sydenham, London.

320,926. (October 31, 1918.) Hose coupling. E. Kessler, Basel, Switzerland.

AUSTRALIA.

PATENTS ISSUED, WITH DATES OF APPLICATION.

7,276. (May 8, 1918.) Motor tire cover. J. H. Gill, J. D. Rea and L. Sanderson.

7,328. (May 11, 1918.) Vehicle wheels and tires. J. R. Churchill.

7,340. (May 11, 1918.) Resilient tires. H. L. Harding.

7,813. (June 27, 1917.) Resilient tire. A. J. Ostberg and A. Kenny.

8,388. (August 21, 1918.) Cushion tires. C. W. Le Plastrier. (Morand Bros.-Martin Cushion Wheel Co.; W. C. Martin.)

8,920. (September 4, 1917.) Inner tube. J. B. Jeffries.

8,953. (March 28, 1918.) Tire valve. M. C. Schweinert.

9,086. (December 31, 1919.) Cushion wheel. C. W. Le Plastrier. (Morand Bros.-Martin Cushion Wheel Co.; W. C. Martin.)

NEW ZEALAND.

ISSUED DECEMBER 31, 1919.

42,[illegible]. Two-piece easily cleaned rubber mouthpiece for feeding-bottle, held in place by stopper. F. R. Graham-Yooll, Dulham Towers, East Trinity Road, Leith, Scotland.

TRADE MARKS.

THE UNITED STATES.

No. 96,047. The word Unisco—automobile-fan belts, fabric belts, rubber or/and fabric hose, etc. C. H. Buettner, Cincinnati, O.

99,120. The word Foster in white and black letters against a red and gold background—rubber soles and heels. Foster Rubber Co., Kennebunk, Me., and Boston, Mass.

106,343. The words Heet and Sheet within horizontal hexagonal inclosures placed to the right and left of a large letter E—packing made of asbestos fiber, rubber, and fireproof cement, in the form of gaskets. Eureka Packing Co., Sales Department, New York City.

107,773. The words Pump-King, one above the other, with a hyphen in front of the lower one—rubber belting. New York Belting & Packing Co., New York City.

109,994. Representation of a bare-legged boy kneeling within and peeping out from a raincoat apparently on a support, topped by a rain-hat—waterproof coats, hats, suits and leggings. Union City Manufacturing Co., Union City, Tenn.

112,154. The word [illegible]—rubber and fabric tires. United States Tire Co., New York City.

113,425. Rrepresentation of a lion in repose above the words Lion Paw [illegible] asbestos brake linings. Buckner Process Co., Worcester, Mass.

[illegible]. The word Goetzerit—asbestos composition packings. Goetze Gasket & Packing Co., New Brunswick, N. J.

115,257. The word Senegal beneath a lion couchant—impregnated canvas belting. [illegible] Belting & Hose Co., New [illegible], N. J.

115,657. The word Farrel—rubber machinery. Farrel Foundry & Machine Co., Ansonia, Conn.

116,950. The words Bi-Lateral—rubber-lined cotton-jacketed fire hose. C. M. C. Baird, Chicago, Ill.

117,767. The word Artco within a triple-outlined diamond—rubber tire casings and tubes, belting, fruit-jar rings, hose, etc. Achilles Rubber & Tire Co., Inc., Binghamton, N. Y.

118,77[illegible]. The word Century—rubber stamps, etc. Century Rubber Stamp Works, New York City.

119,007. The word Valcua—leather, rubber, and balata belting; asbestos, etc., valve and disk packings, and rubber hose. Pacific Mill & Mine Supply Co., San Francisco, Cal.

[illegible]. Representation of an oval figure formed of [illegible]—fabric and rubber belting. The Manhattan Rubber Manufacturing Co., New York City.

[illegible]. The word Usco—jar [illegible]. United States Rubber Co., New Brunswick, N. J.

[illegible]. The words Saving, [illegible] and Satisfaction within the representation of a tire [illegible] and tubes. Automobile Owners Tire Corp., Sioux City, Ia.

[illegible]. The word Radio—rubber and fabric tires. Ellis Miller, New York City.

[illegible]. Representation of a seal bearing the figure of a woman and the words The Fashion Plate—rubber shoes, etc., for men, women, and children. Johnson, Stephens & Shinkle Shoe Co., St. Louis, Mo.

120,[illegible]. The word Gumbo—self-vulcanizing patches. Moses Strause, San Francisco, Cal.

121,308. Representation of a leech bearing the words in white letters, Sticks Like a Leech—tube patches. The Leach Patch Co., Indianapolis, Ind.

121,401. Representation of a circular seal with a globe in the center surrounded by 20 six-pointed stars within a circle, and outside the circle the words The Manhattan Rubber Mfg. Co., Passaic, N. J., all surrounded by a heavily outlined circle and a lighter concentric one—belting, packing, and hose of rubber or rubber and fabric. The Manhattan Rubber Manufacturing Co., Passaic, N. J.

121,758. Representation of a shield bearing the initials C and P formed into a monogram, within two scrolls bearing the words Chicago Pneumatic, the whole conventionally decorated—rubber-lined cotton hose of different kinds, including wire-wound. Chicago Pneumatic Tool Co.. Chicago, Ill.

121,979. The initials S & K—rubber repair patches for tires and tubes. J. F. Kirchner, Parma Township, Cuyahoga County, O.

122,394. The word Kewpie—sanitary baby pants. Maude Sinclair George, St. Louis, Mo.

122,719. The word Majestic rubber tires. The Majestic Tire & Rubber Co., Indianapolis, Ind.

122,832. Representation of a gryphon—air valves for tires, cushions, life-preservers, etc. Griffin Manufacturing Co., Boston, Mass.

123,202. Representation of a seal bearing the words Converse Rubber Shoe Co. on the arms of a large letter C forming the initial for the additional word Converse—rubber boots and shoes. The Converse Rubber Shoe Co., Malden, Mass.

123,229. Representation of a tire rolling through the letter U and leaving an impression of its tread—fabric and rubber tires. Universal Tire & Rubber Association, Houston, Tex.

123,240. The word Colzo within two concentric ovals, the inner one much heavier in outline—lithopone. Collinsville Zinc Corp., Collinsville, Ill.

123,297. Representation of two elephants braced against opposite sides of a globe, having a tug-of-war with their trunks; on the globe a monogram formed of the letters A. W. M. E. C.—elastic webbing. American Webbing Manufacturers Export Corp., New York City.

123,395. The words The Ohio Suspender Co.—suspenders, garters, and belts for personal wear. The Ohio Suspender Co., Mansfield, O.

123,480. The words Vulco Cord rubber tires. The Gates Rubber Co., Denver, Colo.

123,563. Representation of an ornamental design incorporating the words 1 Cent Blue Bird Gum and the figures of two bluebirds within conventionalized scrolls—chewing gum. Universal Products Co., Kansas City, Mo.

123,875. Representation of a seal bearing the words Coingum Mfg. Co., 921 Locust St., Phila., Best of All Gum—chewing gum. Coingum Manufacturing Co., Philadelphia, Pa.

123,989. Representation of a scroll bearing the words Larson's Krushed Fruit—chewing gum. L. P. Larson, Jr., Co., Chicago, Ill.

124,052. The word Dricota—raincoats. Edward Ripley & Son, Limited, Bradford, Eng.

124,264. The word Revo—rubber heels. Thomas M. Evans, East Providence, R. I.

124,265. The word Wids—rubber or composition soles, heels, and taps. Fibre Products Co., Boston, Mass.

124,277. The words Mara Thon—rubber belts for personal wear. The Marathon Tire & Rubber Co., Cuyahoga Falls, O.

124,354. The words Loop-o-Plane—toy airplanes. Percy Pierce, Philadelphia, Pa.

124,420. The word WondErweB with end and center letters capitalized—woven elastics in the piece. Rice-Stix Dry Goods Co., St. Louis, Mo.

124,446. The word Noname—rubber heels. Plymouth Rubber Co., Canton, Mass.

124,468. Representation of a round label bearing the picture of a cavalier bowing and the words The Cavalier Hose Supporter within concentric circles—hose supporters. Roy J. Cavalier, Oswego, N. Y.

124,996. The letters K, Y, and L formed into a monogram above the words K-Weyl—chewing gum, etc. Keebler Weyl Baking Co., Philadelphia, Pa.

125,255. The words Red X—rubber cement, tread filler, tire tape, tire repair gums, and tread repair gums. St. Louis Rubber Co., St. Louis, Mo.

126,048. The word Worthmore in black letters on a white rectangle against a black diamond—suspenders and dress shields. McDonald Bros. Co., Minneapolis, Minn.

THE DOMINION OF CANADA.

25,715. The word Jiffy—rubber baby pants. The I. B. Kleinert Rubber Co., New York City, U. S. A.

25,729. The word Hygeia—nursing appliances and nipples. The Hygeia Nursing Bottle Co., Inc., Buffalo, New York City, U. S. A.

25,735. Representation of a label in the form of a shield having an oval centerpiece bearing the figure of a beaver with a log; around oval are words Canadian Consolidated Rubber Co., Limited, and And Associated Companies; above the oval centerpieces is the word Raynster in large letters—raincoats, rubber coats, and other rubber clothing, etc. Canadian Consolidated Rubber Co., Limited, Montreal, Que.

25,742. The word Diamond and the representation of a diamond in a claw setting—rubber tissues, etc. Will P. White, Limited, Toronto, Ont.

25,803. The word Excelsior—tire casings. Hercules Rubber Co., Limited, Brampton, Ont.

25,854. The word Republic—belting, hose, machinery packing, tires, tire casings, and inner tubes. Republic Rubber Corp., Youngstown, O.

DESIGNS.

THE UNITED STATES.

No. 54,373. Tire. Patented February 10, 1920. Term 14 years. W. P. Braender, Passaic, N. J.

54,408. Tire. Patented February 10, 1920. Term 3½ years. C. C. Gates, Denver, Colo.

54,412. Tire tread. Patented February 10, 1920. Term 14 years. A. H. Harris, Barberton, assignor to The Cleveland Rubber Corp. Co., Cleveland—both in Ohio.

54,434. Pneumatic tire tread. Patented February 10, 1920. Term 3½ years. J. Martin, New York City.

54,496. Tire. Patented February 17, 1920. Term 14 years. J. Christy, Cleveland, assignor to The Portage Rubber Co., Barberton—both in Ohio.

54,415. Rubber tread for shoes. Patented February 17, 1920. Term 14 years. C. M. Wolcott, Baltimore, Md.

54,521. Tire tread. Patented March 2, 1920. Term 14 years. E. O. Blekre, Sioux City, Ia.

54,522. Tire tread. Patented March 2, 1920. Term 14 years. E. O. Blekre, Sioux City, Ia.

54,523. Tire tread. Patented March 2, 1920. Term 14 years. E. O. Blekre, Sioux City, Ia.

54,534. Tire. Patented March 2, 1920. Term 14 years. J. W. Denmead, Akron, O.

54,536. Tire. Patented March 2, 1920. Term 14 years. C. E. Eckrode, Newark, N. J.

54,550. Rubber heel. Patented March 2, 1920. Term 14 years. R. Harris, Cleveland, O.

54,551. Tire tread. Patented March 2, 1920. Term 14 years. H. Ives, Chippewa Falls, Wis.

54,553. Ice-bag ring. Patented March 2, 1920. Term 7 years. F. Lobl, Middleboro, Mass.

54,555. Tire. Patented March 2, 1920. Term 14 years. C. E. Murray, assignor to Empire Rubber & Tire Corp.—both of Trenton, N. J.

54,556. Tire. Patented March 2, 1920. Term 14 years. C. E. Murray, assignor to Empire Rubber & Tire Corp.—both of Trenton, N. J.

54,560. Tire. Patented March 2, 1920. Term 7 years. T. R. Palmer, Erie, Pa.

54,564. Pneumatic metal wheel. Patented March 2, 1920. Term 14 years. H. E. and P. R. Simmons, Huntington, Ind.

54,570. Tire. Patented March 2, 1920. Term 14 years. O. H. Williams, Columbus, O.

54,576. Tire. Patented March 9, 1920. Term 14 years. O. Basten, assignor to Sterling Tire Corp.—both of Rutherford, N. J.

54,580. Tire tread. Patented March 9, 1920. Term 14 years. E. O. Blekre, Sioux City, Ia.

54,581. Tire tread. Patented March 9, 1920. Term 14 years. E. O. Blekre, Sioux City, Ia.

54,582. Tire tread. Patented March 9, 1920. Term 14 years. E. O. Blekre, Sioux City, Ia.

54,583. Tire tread. Patented March 9, 1920. Term 14 years. E. O. Blekre, Sioux City, Ia.

54,592. Tire tread. Patented March 9, 1920. Term 14 years. W. B. Buckley, Washington, D. C.

54,598. Tire. Patented March 9, 1920. Term 14 years. J. Christy, Cleveland, assignor to The Portage Rubber Co., Barberton—both in Ohio.

54,599. Tire. Patented March 9, 1920. Term 7 years. W. H. Clarke, Elyria, O.

54,600. Pad for soles of boots and shoes. Patented March 9, 1920. Term 7 years. J. P. Cochrane, Edinburgh, Scotland.

54,601. Pad for soles of boots and shoes. Patented March 9, 1920. Term 7 years. J. P. Cochrane, Edinburgh, Scotland.

54,608. Tire. Patented March 9, 1920. Term 14 years. F. S. Dickinson, New York City.

54,624. Tire tread. Patented March 9, 1920. Term 14 years. L. de Holczer, assignor to Zonta Tire & Rubber Co.—both of Sioux City, Ia.

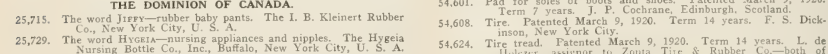
54,625. Tire tread. Patented March 9, 1920. Term 14 years. L. de Holczer, assignor to Zonta Tire & Rubber Co.—both of Sioux City, Ia.

54,647. Tire. Patented March 9, 1920. Term 7 years. J. C. McLean, Lakewood, assignor to The McLean Tire & Rubber Co., East Liverpool—both in Ohio.

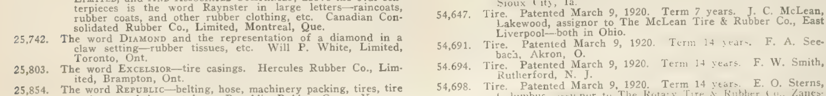
54,691. Tire. Patented March 9, 1920. Term 14 years. F. A. Seebach, Akron, O.

54.694. Tire. Patented March 9, 1920. Term 14 years. F. W. Smith, Rutherford, N. J.

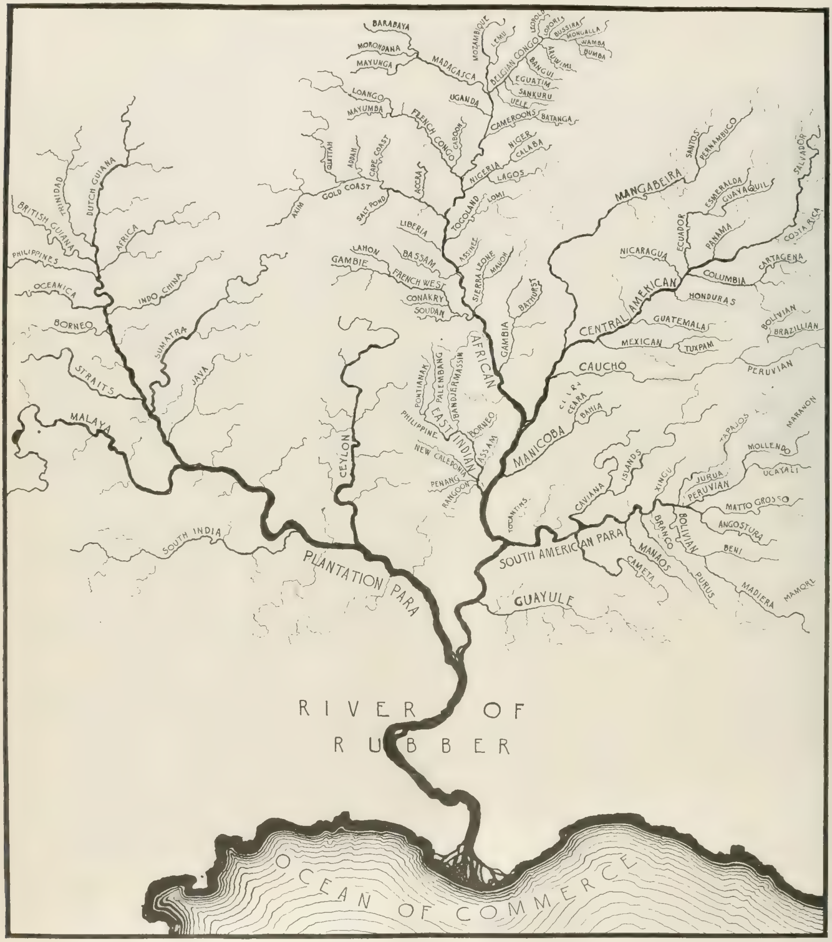
54,698. Tire. Patented March 9, 1920. Term 14 years. E. O. Sterns, Columbus, assignor to The Rotary Tire & Rubber Co., Zanesville—both in Ohio.



54,373 54,412 54,521 54,522 54,523 54,580 54,581 54,582 54,560 54,570 54,592 54,624 54,625 54,647 54,694



54,408 54,434 54,496 54,534 54,536 54,551 54,555 54,556 54,576 54,583 54,598 54,599 54,608 54,691 54,698



THE RIVER OF RUBBER.

Two hundred million gallons of rubber milk from the world's rubber trees are what the River of Rubber delivered in 1919. This, translated into terms of dry rubber, is more than 300,000 tons.

This great stream has affluents, big and little, in all parts of the tropical and subtropical world.

The main streams (or grades of rubber) are five, Central American, South American, African, East Indian and Plantation. These, in turn, are divided into some eighty sorts, bearing the names of territories, rivers and ports. A further subdivision, due to varying methods of collection and coagulation, brings the number of commercial sorts up to about 240.

Not many years ago Brazil was the main source of supply, with a yearly production of 35,000 to 40,000 tons. There was the added product of Central American trees, and those of Southern Asia. Then came the vine, root and tree rubbers of Africa and the shrub rubber of Mexican deserts. Still later, plantation rubber became a factor, constantly increasing, until it now supplies four-fifths of the total.

In 1917 the world's crop was 265,698 tons, of which 213,070 tons were plantation, with 39,370 tons from Brazil and 13,258 tons from all other sources. In 1918, restrictions, mainly on account of the Great War, reduced production nine per cent, the figures being 200,950 tons plantation, 30,700 tons Brazilian and 9,929 tons from other countries. The estimated figures for 1919 are 292,000 tons plantation, 35,000 tons Brazilian and 6,500 tons from other sources, with a reserved stock of 50,000 tons, makes a total of 384,000.

Review of the Crude Rubber Market.

NEW YORK.

The crude rubber market remained [illegible] and quiet throughout March, with two or three slight breaks in which the prices advanced or receded a cent or two. There was some trading among dealers, the manufacturers, however, did little buying.

Parás are picking up a little. Prices at the end of the month are very nearly the same as at the beginning, in spite of the partial recovery in exchange and the very large arrivals of crude rubber. This probably all goes to fill forward orders.

Prices for plantation and South American rubber at the beginning and toward the end of the month are shown in the following quotations:

Plantations. March 1, first latex crêpe, spot 46½ cents; futures, April-June, 47½ cents; July-September, 48½ cents; July-December, 94½ cents; March 25, spot, 47½ cents; April-June, 49 cents; July-December, 51 cents.

March 1, ribbed smoked sheets, spot 46½ cents; April-June, 47½ cents; July-September, 48½ cents; July-December, 49½ cents; March 25, spot, 47 cents; April-June, 49 cents; July-December, 51 cents.

March 1, No. 1 amber crêpe, spot, 46 cents; April-June, 46½ cents; July-December, 47 cents; March 25, spot, 46½ cents; April-June, 47½ cents; July-December, 48½ cents.

March 1, No. 1 rolled brown crêpe, spot, 39 cents; March 25, spot, 40 cents; April-June, 40 cents; July-December, 40½ cents.

South American Parás and Caucho. March 1, spot prices: upriver fine 42 cents, islands fine 42 cents, upriver coarse 31½ cents, islands coarse 20½ cents, Cametá coarse 21½ cents, caucho ball 31½-32 cents.

March 25, upriver fine 42-42½ cents, islands fine 42½ cents, upriver coarse 31½ cents, islands coarse 21½ cents, Cametá coarse 22 cents, caucho ball 32½ cents.

NEW YORK QUOTATIONS.

Following are the New York spot quotations, for one year ago, one month ago and on March 25, the current date:

	April 1, 1919.	March 1, 1920.	March 25, 1920.
PLANTATION HEVEA—			
First latex crepe	$0.51 @	$0.47 @	$0.47½ @
Amber crêpe No. 1	.48 @	.46 @	.46½ @
Amber crêpe No. 2	.47 @	.45 @	.45 @
Amber crêpe No. 3	.46 @	.44 @	.44 @
Amber crepe No. 4	.45 @	.43 @	.42 @
Brown crepe, thick and thin clean	.46 @	.44 @ .45	.43 @
Brown crêpe, thin specky	.43 @	.41 @ .42	.41 @
Brown crepe, rolled	.35 @	.40 @	.40 @
Smoked sheet, ribbed, standard quality	.50 @	.46 @	.47 @
Smoked sheets, plain, standard quality	.48 @	.41 @	.45 @
Unsmoked sheet, standard quality	.49 @	@	@
Colombo scrap No. 1	@	@	[illegible] @
Colombo scrap No. 2	@	@	.31 @
EAST INDIAN—			
Assam crepe	@	@	@
Assam onions	@	@	@
Penang block scrap	@	@	@
SOUTH AMERICAN—			
PONTIANAK—			
Banjermassin	[illegible] @	[illegible] @	[illegible] @
Palembang	@	@	@
Pressed block	.20 @	[illegible] @	[illegible] @
Sarawak	@	@	@
PARÁS—			
Upriver fine	.56 @	[illegible] @	[illegible] @
Upriver medium	[illegible] @	@	[illegible] @
Upriver coarse	.34 @	[illegible] @	[illegible] @
Upriver weak, fine	.44 @	@	[illegible] @
Islands, fine	[illegible] @	[illegible] @	[illegible] @
Islands, medium	.43 @	@	[illegible] @
Islands, coarse	@	[illegible] @	[illegible] @
Cametá, coarse	[illegible] @	[illegible] @	[illegible] @
Madeira, fine	@	@	@
Acre Bolivian, fine	@	@	@
Peruvian fine	[illegible] @	@	[illegible] @
Tapajos fine	.53 @	@	

	April 1, 1919.	March 1, 1920.	March 25, 1920.
SOUTH AMERICAN—			
CAUCHO—			
Lower caucho ball	.31 @	.32 @	[illegible]
Upper caucho ball	.34 @	[illegible]	.32½ @
MANICOBAS—			
Ceara negro heads	@	[illegible] @	[illegible] @
Ceara scrap	@	[illegible] @	[illegible] @
Manicoba, 30% guarantee	[illegible] @	[illegible] @	[illegible] @
Mangabeira thin sheet	.38 @	[illegible]	[illegible] @
CENTRALS—			
Corinto scrap	.33 @	[illegible] @	[illegible] @ [illegible]
Esmeralda sausage	.33 @	[illegible] @	[illegible] @ [illegible]
Central scrap	.33 @	[illegible] @	[illegible] @ [illegible]
Central scrap and strip	.32 @	@	[illegible] @ [illegible]
Central wet sheet	[illegible] @	[illegible] @	.20 @
Guayule, 20% guarantee	.30 @	@	[illegible] @
Guayule, washed and dried	.40 @	[illegible] @	[illegible] @
AFRICANS—			
Niger flake, prime	@	.17½ @	[illegible] @
Benguela, extra No. 1, 28%	@	@	[illegible] @
Benguela, No. 2, 32½%	@	@	[illegible] @
Congo prime, black upper	@	[illegible] @	@
Congo prime, red upper	@	[illegible] @	@
Kassai black	@	[illegible] @	[illegible] @
Kassai red	@	@	@
Rio Nunez ball	@	@	@
Rio Nunez sheets and strings	@	[illegible] @	[illegible]
Conakry niggers	@	[illegible] @	[illegible]
Massai sheets and strings	@	@	
GUTTA PERCHA—			
Gutta Siak	[illegible] @	[illegible] @	[illegible]
Red Macassar	[illegible] @	[illegible] @	[illegible]
BALATA—			
Block, Ciudad Bolivar	.76 @	[illegible] @	.58 @ .60
Colombian	[illegible] @	[illegible] @	.49 @ [illegible]
Panama	.50 @	.46 @	.40 @ .46
Surinam sheet	.96 @	.75 @	.78 @
Surinam amber	[illegible] @	[illegible] @	[illegible] @

RECLAIMED RUBBER.

Essentially the same conditions which prevailed in the reclaimed rubber market during February controlled the situation of reclaimed in all grades during March. Reclaimers are oversold for from two to three months, consequently are not seeking business. Prices, however, have not been advanced and remain as reported last month. Current buying is in relatively small volume and large users are not seeking to make commitments beyond the middle of the year.

NEW YORK QUOTATIONS.

March [illegible], 1920.

Prices subject to change without notice.

Standard reclaims:	
Floating	$0.50 @ [illegible]
Friction	.35 @ .40
Mechanical	[illegible] @ [illegible]
Red	[illegible] @ [illegible]
Shoe	[illegible] @ [illegible]
Tires, auto	[illegible] @ [illegible]
Tires, truck	[illegible] @ [illegible]
White	[illegible] @ [illegible]

COMPARATIVE HIGH AND LOW NEW YORK SPOT RUBBER PRICES.

March.

	1920.[1]		1919.		1918.	
PLANTATIONS						
First latex crepe	[illegible] @	[illegible]	[illegible] @	[illegible]	[illegible] @	[illegible]
PARAS						
Smoked sheet ribbed	.48½ @	.45½	.54½ @	.50	[illegible] @	[illegible]
Upriver, fine	[illegible] @	[illegible]	[illegible] @	[illegible]	[illegible] @	[illegible]
Upriver, coarse	.31¼ @	.31½	.35 @	.34	.34 @	.33½
Islands, fine	[illegible] @	.41	.49½ @	.47½	[illegible] @	[illegible]
Islands, coarse	.20½ @	.20¼	[illegible] @	[illegible]	.24 @	.23
Cametá	.21¼ @	.21	[illegible] @	[illegible]	[illegible] @	[illegible]

[1]Figured only to March 26, 1920.

THE MARKET FOR COMMERCIAL PAPER.

In regard to the financial situation, Albert B. Beers, broker in crude rubber and commercial paper, No. 68 William street, New York City, advises as follows:

"During March there has been a fair demand for paper from out-of-town [illegible] but the latter part of the month [illegible] and considerable amounts of paper have been offered at [illegible] per cent."

SINGAPORE RUBBER REPORT.

GUTHRIE & CO., LIMITED, Singapore, report [February 12, 1920]:

At the usual weekly rubber auctions held yesterday and to-day, prices showed slight declines from those of last week. Fine pale crêpe realized up to $1.12½ (two lots sold at $1.13½) or 1½ cents down, while ribbed smoked sheet sold at $1.13½ (three lots sold at $1.14) or ½-cent below last week's figure. The lower grades showed reductions of ¼-cent

The quantity catalogd was 857 tons, of which 752 tons were offered and 527 tons sold.

The following is the course of values:

	In Singapore, per Pound.[1]	Sterling Equivalent per Pound in London.
Sheet, fine ribbed smoked	110½c @ 113½c	2/9½ @ 2/10⅜
Sheet, good ribbed smoked	105½ @ 110	2/7⅞ @ 2/ 9⅜
Crêpe, fine pale	109½ @ 112½	2/9⅝ @ 2/10½
Crêpe, good pale	106 @ 109	2/8¾ @ 2/ 9½
Crêpe, fine brown	99 @ 105	2/6¾ @ 2/ 8⅜
Crêpe, good brown	95 @ 98½	2/5⅝ @ 2/ 6⅝
Crêpe, dark brown	86 @ 94½	2/3 @ 2/ 5½
Crêpe, bark brown	76 @ 85	2/0¼ @ 2/ 2¾

[1]Quoted in Straits Settlements currency—$1 = $0.567 United States currency.

AMSTERDAM MARKET REPORT.

JOOSTEN & JANSSEN, Amsterdam, report [March 12, 1920]:

The market remained quiet till the beginning of March, when it became very lively and a large business was done at rising prices. Practically all parcels in the auction catalog of inscriptions, postponed on account of the strike, were sold, as well as considerable quantities of rubber in port, but not unloaded.

The highest price paid for first quality *Hevea*, spot, was f. 1.46; the lower grades in proportion. There was a large turnover also in the terminal market, the highest price being f. 1.50 for July and August deliveries.

ANTWERP RUBBER MARKET.

GRISER & CO., Antwerp, report [March 5, 1920]:

At a rubber auction held in Antwerp on February 19, 1920, the first since November, 1919, 618 tons were sold out of 900 tons offered. A small lot of Congo plantation *Hevea* rubber brought 14.45 francs a kilo, while the Malayan plantation rubber put up in the same sale, brought from 14.30 to 14.40 a kilo, which seems to show that the Congo cultivated rubber, properly prepared, can hold its own with the Far Eastern product.

The highest prices obtained for other African varieties were:

	Francs per Kilo.
Upper Congo, equateur, black	8.82½
Upper Congo, Aruwimi	7.55 @ 8.52½
Kassai black	8.85
Kassai red Loanda II	5.97½
Wamba black	8.32½
Yakoma	8.10
Congo plantation *Hevea*	14.45
Straits Settlements smoked sheet	14.30 @ 14.40

The stock on hand in Antwerp is about 521 tons. The recent drop in prices was due to the fall in exchange, but the tone has grown steadier in the last few days. Business was brisker and sales amounting to 140,000 kilos were registered. Price at closing was 13.95.

CRUDE RUBBER ARRIVALS AT ATLANTIC AND PACIFIC PORTS AS STATED BY SHIPS' MANIFESTS.

PARAS and CAUCHO at NEW YORK

	Fine.	Medium.	Coarse.	Caucho.	Totals. Pounds.
February 25. By the S. S. *Bronte*, from Pará.					
Hagemeyer & Brunn	22,400				22,400
Paul Bertuch			86,676		86,676
Lazard Frères	93,100				93,100
General Rubber Co.	89,292				89,292
Meyer & Brown, Inc		239,740	80,184	4,300	324,224
H. A. Astlett & Co.	90,800		61,850		152,650
Poel & Kelly	19,270				19,270
February 26. By the S. S. *Michael*, from Pará.					
H. A. Astlett & Co.	118,200		130,300	216,600	465,100
Paul Bertuch			42,804		42,804
Aldens' Successors, Inc	5,714		5,293	28,293	39,300
Thornett & Fehr, Inc	1,011,604				1,011,604
Hagemeyer & Brunn	224,000			15,000	239,000
March 6. By the S. S. *Stephen*, from Pará					
Poel & Kelly	48,600				48,600
H. A. Astlett & Co.	6,000				6,000
P. Bertuch & Co.	34,436	1,874		11,124	47,434
William Schall & Co.	119,937		2,562	36,537	159,036
Neuss, Hesslein & Co	105,480		30,000		135,480
Thornett & Fehr, Inc.	1,961,190				1,961,190
March 8. By the S. S. *Saint Michael*, from Pernambuco					
Meyer & Brown, Inc.		52,370	34,760		87,130
March 12. By the S. S. *Manchurian Prince*, from Manaos and Pará.					
Hagemeyer & Co.	26,463				26,463
Poel & Kelly	74,299				74,299
H. A. Astlett & Co			33,500	110,200	143,700
General Rubber Co.	82,357				82,357
Paul Bertuch	45,723		88,728	10,864	145,315
Thornett & Fehr, Inc.	869,220				869,220
March 19. By the S. S. *Biela*, from Pará					
Paul Bertuch					301,680
Poel & Kelly					18,032
G. Amsinck & Co., Inc.					12,642
H. A. Astlett & Co.					3,626
New York Overseas Co.					64,288
March 2[illegible]. By the S. S. *Lake [illegible]*, from Pará					
Paul Bertuch	18,[illegible]28	39	[illegible],710	[illegible]	109,958
Various			13,406		13,406

PLANTATIONS.

(Figured 180 pounds to the bale, or case.)

	Shipment from	Shipped to.	Pounds	Totals
February 25. By the S. S. *Maasdijk*, at New York.				
Pablo Hermanos & Co.	Rotterdam	New York	17,460	
Poel & Kelly	Rotterdam	New York	54,500	
Weise & Co.	Rotterdam	New York	274,140	
Aldens' Successors, Inc.	Rotterdam	New York	42,343	
Meyer & Brown, Inc.	Rotterdam	New York	28,000	416,443
February 25. By the S. S. *Kaiserin Augusta Victoria*, at New York.				
Rubber Trading Co.	Liverpool	New York	18,000	
Poel & Kelly	Liverpool	New York	366,120	384,120
February 25. By the S. S. *Lowther Castle*, at New York.				
Hood Rubber Co.	Singapore	Watertown	139,200	
Fred Stern & Co.	Singapore	New York	436,800	
General Rubber Co.	Singapore	New York	78,840	
F. R. Henderson & Co.	Singapore	New York	75,780	
Poel & Kelly	Singapore	New York	185,760	
Hadden & Co.	Singapore	New York	43,500	
Balfour, Williamson & Co.	Singapore	New York	9,000	
L. Littlejohn & Co., Inc.	Singapore	New York	896,000	
The B. F. Goodrich Co.	Singapore	Akron	131,220	
Rubber Importers' & Dealers' Co., Inc.	Singapore	New York	511,740	
Chas. T. Wilson Co., Inc.	Singapore	New York	87,800	
Robinson & Co.	Singapore	New York	28,440	
Meyer & Brown, Inc.	Singapore	New York	277,760	
Pell & Dumont, Inc.	Singapore	New York	20,160	
The Goodyear Tire & Rubber Co.	Singapore	Akron	993,960	
Various	Singapore	New York	1,070,820	4,986,760
February 26. By the S. S. *Ixion*, at Seattle.				
Fred Stern & Co.	Singapore	Akron	224,000	224,000
February 26. By the S. S. *West Modus*, at New York.				
Kuharah Trading Co. Ltd.	Batavia	New York	307,520	
Gaston, Williams & Wigmore	Batavia	New York	62,640	
Winter, Ross & Co.	Batavia	New York	83,700	
The Goodyear Tire & Rubber Co.	Batavia	Akron	237,420	
Thornett & Fehr, Inc.	Batavia	New York	19,800	
The Fisk Rubber Co.	Batavia	Chicopee Falls	181,080	
The B. F. Goodrich Co.	Batavia	Akron	164,340	
J. T. Johnstone & Co., Inc.	Batavia	New York	50,580	
Poel & Kelly	Batavia	New York	18,000	
F. W. Frost & Co., Inc.	Batavia	New York	38,060	
L. Littlejohn & Co., Inc.	Java	New York	537,600	
Java - Holland - American Trading Co.	Singapore	New York	11,160	
Wilson, Holgate & Co., Ltd.	Singapore	New York	137,700	
Konig Bros. & Co.	Singapore	New York	414,540	
G. Kawahara Co.	Singapore	New York	100,800	
Fred Stern & Co.	Singapore	New York	404,400	
Rubber Trading Co.	Singapore	New York	56,880	
Eastern Rubber Co.	Singapore	New York	261,540	
Poel & Kelly	Singapore	New York	613,800	
Goldman, Sachs & Co.	Singapore	New York	43,200	
W. R. Grace & Co.	Singapore	New York	345,780	
Thornett & Fehr, Inc.	Singapore	New York	21,780	
Mitsutichi, Goshi & Co.	Singapore	New York	50,400	
Winter, Ross & Co.	Singapore	New York	139,800	
Meyer & Brown, Inc.	Singapore	New York	190,400	
Rubber Importers' & Dealers' Co., Inc.	Singapore	New York	212,940	
L. Sutro & Co.	Singapore	New York	16,920	
Francis Peek & Co.	Singapore	New York	64,080	
Joosten & Janssen	Singapore	New York	32,940	
Various	Singapore	New York	1,200,240	6,020,040
February 26. By the S. S. *Tokiwa Maru*, at New York.				
Mitsui & Co., Ltd.	Singapore	New York	40,320	
Pacific Trading Corp. of America	Singapore	New York	181,620	
L. Littlejohn & Co., Inc.	Singapore	New York	33,600	
Zuzuki & Co.	Kobe	New York	88,020	
G. Kuwahara Co.	Osaka	New York	192,960	
H. R. Lathrop & Co.	Osaka	New York	18,000	
Various	Singapore	New York	168,180	722,700
February 26. By the S. S. *Sommersdijk*, at New York.				
L. Littlejohn & Co., Inc.	Java	New York	266,400	
L. Sutro & Co.	Soerabaya	New York	30,600	
Mitsui & Co., Ltd.	Soerabaya	New York	51,120	
United Malaysian Co.	Soerabaya	New York	43,020	
General Rubber Co.	Soerabaya	New York	628,200	
Manhattan Rubber Manufacturing Co.	Batavia	New York	46,440	
Mitsui & Co., Limited	Batavia	New York	142,020	
General Rubber Co.	T'jong Priok	New York	196,740	
Poel & Kelly	T'jong Priok	New York	49,680	
L. Sutro & Co.	T'jong Priok	New York	74,880	
Alden's Successors, Inc.	T'jong Priok	New York	66,439	
General Rubber Co.	Deli	New York	72,000	
F. R. Henderson & Son.	Deli	New York	68,940	
Vernon Metal & Produce Co.	Deli	New York	109,620	
Various	Deli	New York	374,940	
Various	Soerabaya	New York	116,100	
Various	Batavia	New York	192,780	2,529,919
February 29. By the S. S. *Cedric*, at New York.				
Alden's Successors, Inc.	Liverpool	New York	8,402	8,402
March 1. By the S. S. *Bengalis*, at San Francisco.				
L. Littlejohn & Co., Inc.	Java	San Francisco	160,220	160,220

	Shipment from:	[illegible]	[illegible]	[illegible]
March [illegible]. By the S. S. [illegible], at San Francisco.				
Hadden & Co.	Singapore	San Francisco	[illegible]	[illegible]
March [illegible]. By the S. S. [illegible], at San Francisco.				
Hadden & Co.	Singapore	San Francisco	[illegible]	10,000
March [illegible]. By the S. S. [illegible], at San Francisco.				
Hadden & Co.	Singapore	San Francisco	[illegible]	[illegible]
March 1. By the S. S. *W[illegible]*, at New York.				
Fred Stern & Co.	Singapore	New York	[illegible]	
Hood Rubber Co.	Singapore	Watertown	[illegible]	
Hadden & Co.	Singapore	New York	[illegible]	
L. Littlejohn & Co., Inc.	Singapore	New York	156,800	
Aldens' Successors, Inc.	Oran	New York	[illegible]	
Thornett & Fehr, Inc.	Singapore	New York	[illegible]	[illegible]
March 1. By the S. S. *[illegible] Maru*, at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	22,400	
General Rubber Co.	Singapore	New York	[illegible]	
United States Rubber Co.	Singapore	New York	[illegible]	
[illegible] & Co.	Singapore	Seattle	[illegible]	
Chas. T. Wilson Co., Inc.	Singapore	New York	35,640	
Poel & Kelly	Singapore	New York	[illegible]	
Thornett & Fehr, Inc.	Singapore	New York	[illegible]	[illegible]
March 2. By the S. S. *Port Lincoln*, at New York.				
Poel & Kelly	London	New York	[illegible]	
General Rubber Company	London	New York	421,200	
F. R. Downing & Co.	London	New York	131,580	
Goldman, Sachs & Co.	London	New York	1,440	
Chas. T. Wilson Co., Inc.			118,800	
Aldens' Successors, Inc.			1,969,628	
Various			45,000	[illegible]
March 2. By the S. S. *Challenger*, at New York.				
T. D. Downing & Co.	London	New York	130,140	
Fred Stern & Co.	London	New York	3,223	[illegible]
March 3. By the S. S. *Manoa*, at New York.				
Middleton & Co., Ltd.	Demerara	New York	2,235	[illegible]
March 5. By the S. S. *Haleric*, at New York.				
Fred Stern & Co.	Colombo	New York	56,000	
L. Littlejohn & Co., Inc.	Singapore	New York	89,600	145,600
March 6. By the S. S. *City of Shanghai*, at New York.				
General Rubber Company	Colombo	New York	208,620	
Meyer & Brown, Inc.	Colombo	New York	280,000	
L. Littlejohn & Co., Inc.	Singapore	New York	60,250	
Various	Singapore	New York	2,390,020	2,938,890
March 6. By the S. S. *Ruby*, at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	23,342	23,342
March 8. By the S. S. *West Harcuvar*, at New York.				
Thornett & Fehr, Inc.	London	New York	141,000	141,000
March 9. By the S. S. *Mesaba*, at New York.				
T. D. Downing & Co.	London	New York	160,200	
General Rubber Co.	London	New York	354,520	
Mitsui & Co., Limited	London	New York	203,940	
William Brandt's Sons	London	New York	170,000	
Chas. T. Wilson Co., Inc.	London	New York	75,600	
Meyer & Brown, Inc.	London	New York	56,000	
L. Littlejohn & Co., Inc.	London	New York	35,318	
Thornett & Fehr, Inc.	London	New York	112,096	1,167,774
March 9. By the S. S. *Choyo Maru*, at San Francisco.				
Various	Singapore	San Francisco	427,320	
Various	Batavia	San Francisco	359,640	
Various	Soerbaya	San Francisco	357,300	
Various	Nagaski	East Cities	1,222,480	2,366,740
March 9. By the S. S. *Edgemont*, at New York.				
W. R. Grace & Co.	London	New York	43,740	
T. D. Downing & Co.	London	New York	131,940	
Fred Stern & Co.	London	New York	146	
Meyer & Brown, Inc.	London	New York	22,400	
Various	London	New York	194,894	393,120
March 10. By the S. S. *Vellavia*, at New York.				
General Rubber Co.	Liverpool	New York	2,160	
Poel & Kelly	Liverpool	New York	38,160	
F. R. Henderson	Liverpool	New York	22,500	
Chas. T. Wilson Co., Inc.	Liverpool	New York	58,140	
G. Harkinson & Co.	Liverpool	New York	9,900	
Various	Liverpool	New York	23,940	154,800
March [illegible]. By the S. S. *West Hepburn*, at San Francisco.				
F. R. Henderson & Co.		New York	430,920	
Firestone Tire & Rubber Co.	Singapore Singapore	Akron	779,580	1,210,500
March [illegible]. By the S. S. *Invincible*, at New York.				
Hecht, Lewis & Kahn	London	New York	109,800	109,800
March 16. By the S. S. *Knight Templar*, at New York.				
Aldens' Successors, Inc.	Singapore	New York	21,060	
Fred Stern & Co.	Singapore	New York	280,000	
Thornett & Fehr, Inc.	Singapore	New York	322,380	
Wm. Symington & Co., Ltd.	Singapore	New York	8,020	
Edward Maurer Co., Inc.	Singapore	New York	299,500	
Rubber Trading Co.	Singapore	New York	49,500	
Meyer & Brown, Inc.	Singapore	New York	78,400	
L. Littlejohn & Co., Inc.	Singapore	New York	291,200	
Poel & Kelly	Singapore	New York	673,740	
F. R. Henderson & Co.	Singapore	New York	317,340	
Chas. T. Wilson Co., Inc.	Singapore	New York	27,000	
Thos. A. Desmond & Co.	Singapore	New York	145,980	
General Rubber Co.	Singapore	New York	634,500	
Winter, Ross & Co.	Singapore	New York	50,400	

	Shipment from:	[illegible]	[illegible]	[illegible]
[illegible]	Singapore	New York	[illegible]	
[illegible] & Co., Inc.	Singapore	New York	86,580	
The [illegible] Rubber Co.	Singapore	Chicopee Falls	112,500	
[illegible] Trading Corp. of America	Singapore	New York	175,860	
[illegible]	Singapore	New York	69,120	
East Asiatic Co., Inc.	Singapore	New York	[illegible]	
The B. F. Goodrich Co.	Singapore	Akron	518,760	
Goldman, Sachs & Co.	Singapore	New York	91,800	
Various	Singapore	New York	1,149,840	
The Fisk Rubber Co.	Deli	Chicopee Falls	135,540	
Aldens' Successors, Inc.	Deli	Akron	102,420	
The B. F. Goodrich Co.	Deli	Akron	75,060	
[illegible] & Co., Inc.	Deli	New York	[illegible]	
The Goodyear Tire & Rubber Co.	Deli	Akron	119,340	
Firestone Tire & Rubber Co.	Deli	Akron	[illegible]	
Hood Rubber Co.	Deli	Watertown	108,000	
Edward Boustead & Co.	Penang	New York	[illegible]	
F. R. Henderson & Co.	Penang	New York	[illegible]	
Pacific Trading Corp. of America	Penang	New York	27,000	
Meyer & Brown, Inc.	Penang	New York	39,600	
William H. Stiles & Co.	Penang	New York	99,000	
Aldens' Successors, Inc.	Penang	New York	[illegible]	
Thornett & Fehr, Inc.	Penang	New York	10,080	
The B. F. Goodrich Co.	Penang	Akron	605,340	
The Goodyear Tire & Rubber Co.	Penang	Akron	39,240	
Various	Penang	New York	[illegible]	[illegible]
March 17. By the S. S. *[illegible]*, at New York.				
Poel & Kelly	London	New York	819,540	
General Rubber Co.	London	New York	916,640	
Smith & Schippers, Inc.	London	New York	59,400	
Fred Stern & Co.	London	New York	208,331	
Aldens' Successors, Inc.	London	New York	787,598	
Thornett & Fehr, Inc.	London	New York	350,000	
Various	London	New York	894,349	4,035,858
March 17. By the S. S. *Bardic*, at New York.				
Mitsui & Co., Ltd.	London	New York	54,720	
Thornett & Fehr, Inc.	London	New York	92,000	146,720
March 19. By the S. S. *West Kaddoa*, at San Francisco.				
Various	Singapore	San Francisco	585,540	
Various	Penang	San Francisco	754,740	1,340,280
March 22. By the S. S. *Atreus*, at New York.				
F. R. Henderson & Co.	Singapore	New York	457,920	
Adolph Hirsch & Co.	Singapore	New York	55,800	
Rogers-Pyatt Shellac Co.	Singapore	New York	72,540	
Frank Waterhouse & Co.	Singapore	New York	28,800	
American Trading Co.	Singapore	New York	30,060	
Thos. A. Desmond & Co.	Singapore	New York	99,720	
Aldens' Successors, Inc.	Singapore	New York	61,560	
Thornett & Fehr, Inc.	Singapore	New York	20,160	
Balfour, Williamson & Co.	Singapore	New York	293,760	
Chas. T. Wilson Co., Inc.	Singapore	New York	195,120	
L. Littlejohn & Co., Inc.	Singapore	New York	479,880	
Poel & Kelly	Singapore	New York	17,640	
Rubber Trading Co.	Singapore	New York	60,480	
Meyer & Brown, Inc.	Singapore	New York	83,700	
W. G. Ryckman, Inc.	Singapore	New York	28,800	
Edward Maurer Co., Inc.	Singapore	New York	216,000	
Pacific Trading Corp. of America	Singapore	New York	18,720	
General Rubbber Co.	Singapore	New York	2,063,700	
Hood Rubber Co.	Singapore	Watertown	100,800	
Fred Stern & Co.	Singapore	New York	10,080	
William H. Stiles & Co.	Singapore	New York	69,300	
The Goodyear Tire & Rubber Co.	Singapore	Akron	193,500	
Mitsui & Co., Ltd.	Singapore	New York	129,600	
Booth & Co.	Singapore	New York	9,180	
C. F. McPhillips	Singapore	New York	5,580	
L. Sutro & Co.	Singapore	New York	20,160	
Various	Singapore	New York	791,460	
The Fisk Rubber Co.	Deli	Chicopee Falls	210,420	
William H. Stiles & Co.	Deli	New York	110,340	
Fred Stern & Co.	Deli	New York	16,560	
L. Littlejohn & Co., Inc.	Deli	New York	12,240	
Firestone Tire & Rubber Co.	Deli	Akron	[illegible]	
The Goodyear Tire & Rubber Co.	Deli	Akron	129,600	
Various	Deli	New York	45,540	
Various	Penang	New York	[illegible]	[illegible]
March 22. By the S. S. *Kawachi Maru*, at New York.				
Chas. T. Wilson Co., Inc.	Colombo	New York	88,560	
Meyer & Brown, Inc.	Colombo	New York	135,000	
Firestone Tire & Rubber Co.	Colombo	Akron	10,080	
Various	Colombo	New York	494,280	727,920
March 22. By the S. S. *Trikieve*, at New York.				
Poel & Kelly	Colombo	New York	113,220	
Charles T. Wilson & Co. Inc.	Colombo	New York	45,000	
Kidder, Peabody & Co.	Colombo	New York	61,200	
Various	Colombo	New York	178,560	397,980

PLANTATIONS.—Continued

	Shipment from	Shipped to	Pounds	Totals
March [illegible]. By the S. S. [illegible] Maru, at New York.				
Pacific Trading Corp. of America	Singapore	New York	247,680	
Thornett & Fehr, Inc...	Singapore	New York	87,480	
F. R. Henderson & Co..	Singapore	New York	50,400	
Mitsubiski Goshi Kaisha.	Singapore	New York	100,800	
Various	Singapore	New York	108,000	594,360
March 22. By the S. S. *West Ekonk*, at New York.				
Various	Liverpool	New York	300	300
March [illegible]. By the S. S. [illegible], at New York.				
The Goodyear Tire & Rubber Co.	Colombo	Akron	90,000	
F. R. Henderson & Co..	Colombo	New York	57,780	
C. C. Trevanion & Co..	Colombo	New York	138,600	
Volkart Bros.	Colombo	New York	74,340	
Weise & Co.	Colombo	New York	25,020	
Poel & Kelly	Colombo	New York	41,940	
Chas. T. Wilson Co., Inc.	Colombo	New York	55,800	
Various	Colombo	New York	37,980	521,460
March 22. By the S. S. *Oanfa*, at New York.				
Edward Boustead & Co.	Singapore	New York	166,140	
Aldens' Successors, Inc.	Singapore	New York	191,340	
Balfour, Williamson & Co.	Singapore	New York	226,980	
Robinson & Co.	Singapore	New York	28,800	
Thornett & Fehr, Inc..	Singapore	New York	134,460	
Rubber Trading Co....	Singapore	New York	100,800	
The Fisk Rubber Co....	Singapore	Chicopee Falls	221,940	
F. R. Henderson & Co..	Singapore	New York	901,900	
L. Littlejohn & Co., Inc.	Singapore	New York	672,120	
William H. Stiles & Co.	Singapore	New York	23,400	
Fred Stern & Co.	Singapore	New York	160,380	
W. G. Ryckman, Inc....	Singapore	New York	46,800	
Poel & Kelly	Singapore	New York	2,149,920	
Edward Maurer Co., Inc.	Singapore	New York	397,800	
Chas. T. Wilson Co., Inc.	Singapore	New York	286,200	
Mitsui & Co., Limited..	Singapore	New York	130,320	
Meyer & Brown, Inc....	Singapore	New York	94,500	
Thos. A. Desmond & Co.	Singapore	New York	338,400	
Hadden & Co.	Singapore	New York	115,200	
Boston Insulated Wire & Cable Co.	Singapore	Dorchester	5,400	
H. A. Forbes & Co....	Singapore	New York	22,320	
General Rubber Co.....	Singapore	New York	2,374,920	
Robert Dollar Co.	Singapore	New York	110,520	
United Malaysian Rubber co., Ltd.	Singapore	New York	81,180	
W. T. Sargent & Sons..	Singapore	New York	33,660	
East Asiatic Co.	Singapore	New York	244,080	
The Goodyear Tire & Rubber Co.	Singapore	Akron	387,900	
Mitsubishi Goshi Kaisha	Singapore	New York	50,400	
Rubber Importers & Dealers' Co., Inc.	Singapore	New York	59,940	
Pacific Trading Corp. of America	Singapore	New York	55,980	
Hood Rubber Co.	Singapore	Watertown	201,600	
Dunlop Tire & Rubber Co., Limited	Singapore	Toronto	42,660	
Various	Singapore	New York	867,240	
Norton, Lilly & Co.....	Penang	New York	111,420	
Various	Penang	New York	24,840	
Various	Jeluk Anson	New York	35,100	
L. Littlejohn & Co., Inc.	Deli	New York	229,680	
Irwin-Harrison & Crosfield, Inc.	Deli	New York	157,500	
Balfour, Williamson & Co.	Deli	New York	18,000	
The Fisk Rubber Co....	Deli	Chicopee Falls	34,200	
L. Littlejohn & Co., Inc.	P't Sw't'nh'm	New York	460,800	
Meyer & Brown, Inc...	P't Sw't'nh'm	New York	9,000	
Various	P't Sw't'nh'm	New York	274,320	
Vernon Metal & Produce Co.	Deli	New York	59,940	
Poel & Kelly	Deli	New York	17,100	
F. R. Henderson & Co..	Deli	New York	27,360	
Aldens' Successors, Inc.	Deli	New York	126,000	
Fred Stern & Co.	Deli	New York	45,000	
General Rubber Co....	Deli	New York	6,480	
Firestone Tire & Rubber Co.	Deli	New York	83,880	
The Goodyear Tire & Rubber Co.	Deli	Akron	192,780	
Various	Deli	Akron	231,120	3,0[illegible]
March 15. By the S. S. *Ablanset*, at New York.				
Poel & Kelly	Lisbon	New York	537,640	537,640
March 22. By the S. S. *Hatteras*, at New York				
J. W. Elwell & Co.	Marseilles	New York	5,750	
Various	Marseilles	New York	4,800	10,550

AFRICANS.

	Shipment from	Shipped to	Pounds	Totals
February 23. By the S. S. *Syria*, at New York.				
Various	Marseilles	New York	4,485	4,485
February 26. By the S. S. *Wabash*, at New York.				
Fred Stern & Co.	Bordeaux	New York	11,000	
Various		New York	108,915	119,915
March 7. By the S. S. [illegible], at New York.				
Fred Stern & Co.	Liverpool	New York	7,799	7,799
March 9. By the S. S. *Ruby*, at New York.				
Fred Stern & Co.	Marseilles	New York	22,868	
L. Littlejohn & Co., Inc.	Marseilles	New York	23,400	46,268
March 11. By the S. S. *Vellavia*, at New York.				
Meyer & Brown, Inc....	Liverpool	New York	11,200	11,200
March 12. By the S. S. *Frankinver*, at New York.				
Bers & Co.	Bordeaux	New York	16,740	16,740
March 13. By the S. S. *Portuguese Prince*, at New York.				
Poel & Kelly	Havre	New York	42,205	42,205
March 14. By the S. S. *Niagara*, at New York.				
Various	Bordeaux	New York	86,250	86,250

BALATA.

	Shipment from	Shipped to	Pounds	Totals
March 3. By the S. S. *Manca*, at New York.				
Middleton & Co., Limited.	Demerara	New York	2,697	2,697
March 5. By the S. S. *Gen. G. W. Goethals*, at New York.				
Heilbron, Wolff & Co..	Cristobal	New York	1,200	
A. N. Capen's Sons.....	Cristobal	New York	900	2,100
March 9. By the S. S. *Achilles*, at New York.				
Middleton & Co.	Paramaribo	New York	5,000	5,000
March 17. By the S. S. *Volumnia*, at New York.				
Earle Bros.	London	New York	4,500	4,500
March 19. By the S. S. *Corillo*, at New York.				
G. Aminsck & Co., Inc..	Pt. Colombia	New York	4,312	4,312
March 22. By the S. S. *West Ekonk*, at New York.				
Earle Bros.	Liverpool	New York	5,700	5,700

CENTRALS.

	Shipment from	Shipped to	Pounds	Totals
February 24. By the S. S. *Lysefjord*, at New York.				
Wm. Scholl & Co.	Curaçao	New York	5,100	5,100
February 24. By the S. S. *Monterey*, at New York.				
The Sleeper Trading Co.	Mexico	New York	900	900
March 5. By the S. S. *Gen. G. W. Goethals*, at New York.				
Pablo, Calvet & Co......	Cristobal	New York	22,050	
Mecke & Co.	Cristobal	New York	7,350	
Ultramares Corp.	Cristobal	New York	4,650	
Heilbron, Wolff & Co..	Cristobal	New York	1,350	
Wellman, Peck & Co....	Cristobal	New York	1,800	
A. N. Capen's Sons.....	Cristobal	New York	1,650	
Dumarest Bros.	Cristobal	New York	1,350	
G. Amsinck & Co., Inc..	Cristobal	New York	300	
William Scholl & Co....	Cristobal	New York	1,050	41,550
March 8. By the S. S. *Colon*, at New York.				
Isaac Brandon & Bros..	Panama	New York	2,500	2,500
March 9. By the S. S. *Cherokee*.				
E. Echaranna & Co.....	Cartagena	New York	4,860	4,860

PONTIANAK.

	Shipment from	Shipped to	Pounds	Totals
February 26. By the S. S. *West Modus*, at New York.				
Latham & Co.	Singapore	New York	30,000	30,000
February 26. By the S. S. *Sommersdijk*, at New York.				
United Malaysian Rubber Co.	Soerabaya	New York	20,100	
E. Everett Carlton & Co.	Soerabaya	New York	41,100	61,200
March 16. By the S. S. *Knight Templar*, at New York.				
Meyer & Brown, Inc....	Singapore	New York	123,000	
United Malaysian Rubber Co., Limited......	Singapore	New York	100,899	
H. W. Peabody & Co....	Singapore	New York	182,100	
Various	Singapore	New York	209,100	615,099
March 22. By the S. S. *Atreus*, at New York.				
United Malaysian Rubber Co., Limited	Singapore	New York	45,600	
Various	Singapore	New York	75,900	121,500
March 22. By the S. S. *Oanfa*, at New York.				
United Malaysian Rubber Co., Limited	Singapore	New York	286,500	
Various	Singapore	New York	222,000	508,500

GUAYULE.

	Shipment from	Shipped to	Pounds	Totals
March 19. By rail at Eagle Pass, Texas.				
Continental-Mexican Rubber Co., Limited......	Mexico	New York	99,000	99,000

GUTTA SIAK.

	Shipment from	Shipped to	Pounds	Totals
February 26. By the S. S. *Leather Castle*, at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	111,960	111,960
March 16. By the S. S. *Knight Templar*, at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	74,700	
United Malaysian Rubber Co.	Singapore	New York	8,847	83,547
March [illegible]. By the S. S. *Oanfa*, at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	50,100	50,100

ANTWERP RUBBER ARRIVALS.

February 1[illegible]. By the S. S. *Albertville*, from the Congo.

Bungé et Cie	kilos	15,131
Bungé et Cie ([illegible])		650
Bungé et Cie (Intertropical)		6,410
Bunge et Cie (Compagnie du Kassai)		2,900
Bunge et Cie (Grands Lacs)		3,393
Bungé et Cie (Crédit Colonial et Commercial)		37,175
Bungé et Cie (Belgika)		8,090
Société Coloniale Anversoise (Chemins de fer du Haut Congo)		10,200
Various		2,675
Total	kilos	86,624

(Compiled by [illegible] & Co., Antwerp.)

UNITED STATES CRUDE RUBBER IMPORTS FOR 1920 (BY MONTHS)

Months.	Plantations.	Paras.	[illegible]	[illegible]	[illegible]	Manicoba and Matto Grosso.	Totals 1920.	Totals 1919.
January	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	...	21,351	7,235
February	29,681	2,456	[illegible]	[illegible]	[illegible]	...	32,994	17,456
Totals	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	...	54,345	24,691

[illegible]

CEYLON RUBBER IMPORTS AND EXPORTS.

IMPORTS.

	January 1 to February [illegible]	
Crude rubber	1919.	[illegible]
From Straits Settlements..	[illegible]	385,000
India	175,811	[illegible]
Burma and other countries		6,300
Totals	175,811	[illegible]

EXPORTS.

Crude Rubber		
To United Kingdom	pounds [illegible]	[illegible]
Belgium ...	......	[illegible]
France	.....	11,260
United States	 3,512,642	[illegible]
Canada ..	. .	[illegible]
India	[illegible]	...
Straits Settlements	424	......
Japan ..	11,200	[illegible]
Totals	[illegible]	[illegible]

[illegible]

PLANTATION RUBBER EXPORTS FROM JAVA.

	December		Twelve Months Ended December 31.	
	[illegible]	1919.	[illegible]	1919.
To Netherlands	[illegible]	325,000	[illegible]	2,970,000
Great Britain ..	[illegible]	[illegible]	[illegible]	7,223,000
France .	.	[illegible]	. .	215,000
Sweden .	.	[illegible]	.	[illegible]
United States	[illegible]	[illegible]	[illegible]	18,767,000
Singapore	[illegible]	[illegible]	[illegible]	5,465,000
Japan	14,000	.	[illegible]	183,000
Australia ..	127,000		[illegible]	245,000
Other countries	. . .		94,000	169,000
Totals	1,559,000	3,122,000	17,303,000	35,262,000
Ports of origin:				
Tandjong Priok	881,000	2,145,000	9,212,000	18,512,000
Samarang	14,000	58,000	146,000	562,000
Soerabaya	[illegible]	914,000	7,506,000	15,000,000
Probolinggo ..	.....	6,000	....	6,000
Cheribon	.... .	......	... .	7,000
Tjilatjap .	. ....	....	.	235,000

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official cablegram from Singapore states that the exports of plantation rubber from the ports of the Straits Settlements amounted to 13,125 tons in the month of January, compared with 14,214 tons in December last. Comparative statistics follow:

	[illegible]	[illegible]	[illegible]
January .... tons	[illegible]	[illegible]	[illegible]

Transhipments for the month of January amounted to [illegible] tons.

FEDERATED MALAY STATES RUBBER EXPORTS.

A cablegram from Kuala Lumpur reports that 11,119 tons of plantation rubber were exported from the Federated Malay States in the month of January. This compares with 10,340 tons in December last. Comparative statistics follow:

	[illegible]	[illegible]	[illegible]
January .. .. tons	[illegible]	7,163	[illegible]

EXPORTS OF CRUDE RUBBER FROM BELAWAN (DELI), SUMATRA

	[illegible]	[illegible]	1918	[illegible]
To Netherlands		964,445		4,424,119
Great Britain		594,645	3,234,358	7,997,196
Italy				134,464
United States		1,932,064	6,229,714	16,241,507
Canada			132,088	
British India.			329,846	
Japan				[illegible]
Australia ...				[illegible]
Penang	[illegible]	78,355	338,059	[illegible]
Singapore	1,757,362	2,341,009	13,591,239	[illegible]
Hongkong ..		192,958		[illegible]
Totals .	1,881,141	6,103,476	23,855,184	49,554,958

MALAYAN RUBBER EXPORTS FOR DECEMBER, 1919.

From	Penang.	Singapore.	Port Swet'nh'm.	Malacca.	Totals.
To Great Britain pounds	[illegible]	658,267	3,072,117	319,157	7,294,377
Rest of Europe .		.	[illegible]		42,455
United States, Pacific ports	[illegible]	[illegible]	..	......	6,530,084
New York	[illegible]	[illegible]	[illegible]	......	18,216,348
Canada		[illegible]	.....	......	262,533
Colombo .	[illegible]	..	[illegible]	......	291,043
Japan .		322,933	.....	......	322,933
Totals	6,624,421	22,631,866	3,384,328	319,157	32,959,773

[illegible]

EXPORTS OF INDIA RUBBER FROM MANAOS DURING JANUARY, 1920.*

NEW YORK.

Exporters.	Fine.	Medium.	Coarse.	Caucho.	Totals.
Stowell & Co. ... kilos	112,859	8,805	21,368	[illegible]	[illegible]
General Rubber Co. of Brazil	85,626	6,173	3,500	[illegible]	96,000
Ohliger & Co.	72,535	8,321	6,480	6,241	93,577
Tancredo, Porto & Co.	. . .	10,200	19,831	45,961	75,992
A. Souza	1,044	63	28,462	31,249	60,818
Y. A. Mendes & Co.	. .	7,090	8,630	26,762	42,482
Moraes Carneiro & Co.	[illegible]	3,518	752	. .	11,950
Amorim Irmãos	....	2,240	[illegible]	[illegible]	5,700
Semper & Co.	[illegible]	[illegible]	[illegible]	[illegible]	5,485
Adelbert H. Alden, Limited. .	170	133	[illegible]	[illegible]	4,821
Archer Pinto & Co.	1,571	116	[illegible]	[illegible]	3,060
Total Manáos	284,830	47,299	[illegible]	[illegible]	[illegible]
In transit, Iquitos..........	67,063	216,359	[illegible]	[illegible]	[illegible]
Totals	351,893	263,658	123,168	135,901	874,620

*There were no exports to Europe.
(*Compiled by Stowell & Co., Manáos, Brazil.*)

EXPORTS OF INDIA RUBBER AND CAUCHO FROM PARA, MANAOS AND IQUITOS DURING JANUARY, 1920.*

NEW YORK.

Exporters.	Fine.	Medium.	Coarse.	Caucho.	Totals.
J. Marques ... .kilos	116,375	13,403	92,377	22,584	244,739
Stowell & Co.	136,975	15,921	52,027	35,060	239,983
Alfredo Valle & Co.	78,975	2,949	39,002	53,456	174,382
Chamié & Koury, Limited	[illegible]	2,647	40,882	27,695	141,905
General Rubber Co.	[illegible]	4,949	42,684	2,208	118,473
Berringer & Co. .	[illegible]	5,166	35,351	995	117,063
Suarez Filho & Co.	[illegible]	..	2,655	2,100	76,968
Bitar Irmãos ...	[illegible]	[illegible]	6,930	1,600	9,370
Sundries	[illegible]	[illegible]	16,880	1,440	32,218
	633,299	[illegible]	328,788	147,139	1,155,101
From Itacoatiara	[illegible]	2,950	[illegible]	767	58,306
From Manáos	407,897	79,080	157,189	167,168	811,334
From Iquitos	724,256	11,144	55,888	29,374	820,662
	1,802,844	139,049	559,062	344,448	2,845,403

*There were no exports to Europe.
(*Compiled by [illegible], Pará, Brazil.*)

EXPORTS OF INDIA RUBBER AND CAUCHO FROM PARA, ITACOATIARA, MANAOS AND IQUITOS DURING 1919

	EUROPE.					NEW YORK.					Other Brazilian ports.	Grand Total.
Exporters.	Fine.	Medium.	Coarse.	Caucho.	Totals.	Fine.	Medium.	Coarse.	Caucho.	Totals.		
J. Marques ... kilos	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Stowell & Co.	905,497	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	315,981	[illegible]		[illegible]
Bank of Brazil					. .	[illegible]	[illegible]	[illegible]		[illegible]		[illegible]
Suarez, Filho & Co.	[illegible]		.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
General Rubber Co. of Brazil	274,121	[illegible]	[illegible]	[illegible]	337,151	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
Chamié & Koury, Limited			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
Bitar Irmãos .	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	161,348	[illegible]	[illegible]		[illegible]
Alfredo Valle & Co.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.	[illegible]
Berringer & Co.					...	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
Adelbert H. Alden, Limited	[illegible]		[illegible]	10,142	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
Sundries	[illegible]	[illegible]	[illegible]	[illegible]	427,162	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
Exports from Para	3,334,249	[illegible]	173,773	750,639	4,341,251	8,831,378	[illegible]	3,555,187	3,500,258	[illegible]	[illegible]	21,039,415
Exports from Itacoatiara	39,430	[illegible]	2,380	5,130	47,120	40,076	3,930	10,139	124	54,269		101,389
Exports from Manáos ..	4,710,369	[illegible]	276,347	626,714	5,958,569	4,119,375	915,155	1,722,078	2,594,781	9,351,389		15,309,958
Exports from Iquitos .	302,364	[illegible]	47,097	271,198	629,929	1,079,606	75,626	354,317	713,248	2,222,797		2,852,726
Totals .	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1,801,886	5,641,721	6,808,411	28,322,543	4,166	39,303,488

(*Compiled by J. Marques, Pará, Brazil.*)

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES, DURING THE MONTH OF JANUARY, 1920.

EXPORTED TO—	Belting. Value.	Hose Value.	Packing Value.	Boots Pairs.	Boots Value	Shoes. Pairs.	Shoes. Value.	Soles and Heels. Value.	Automobile Tires. Casings. Value.	Automobile Tires. Inner Tubes. Value.	Automobile Tires. Solid Tires Value.	Automobile Tires. All Others. Value.	Insulated Wire and Cables. Value.	All Other Manufactures of Rubber. Value	Totals. Value.
EUROPE															
Austria									$4,300						$4,300
Azores and Madeira Islands									285						285
Belgium			$293			6,961	$4,565		123,114	$3,229	$3,108	$2,096	$670	$11,324	148,399
Bulgaria						1,320	1,300								1,300
Czechoslovakia														275	275
Denmark				6,792	$13,526	68,505	46,891		130,734	3,202		7,610	1,541	13,314	216,818
Finland						66,106	57,173	$138	22,402	170			9,585	38	89,515
France	$1,042	$123	101	162	1,005	99,701	68,338		346,817	1,648		2,704	2,764	70,858	495,400
Germany						60	70		498				50	350	968
Gibraltar									98						98
Greece						9,168	8,563	567	28,770	322		898	4,303	823	44,246
Italy				3	35	1,008	1,008		45,998			9,296	67,343	1,612	125,292
Malta, Gozo and Cyprus Islands									75						75
Netherlands	2,210	200	64			27,049	26,768		89,443	2,103		4,337	16,030	14,494	155,649
Norway		3,058		9,379	53,404	181,483	161,448	283	93,859	457		435	191,037	21,748	525,729
Poland and Danzic				30	120	2,113	1,723		1,531						3,374
Portugal						1,432	1,100		109,356	1,627		1,454	2,500	81	116,849
Rumania									78,515	2,788					81,303
Russia in Europe	2,340								1,750					15	4,105
Spain	308	52				2,228	1,975		107,004			1,113	5,118	2,014	117,584
Sweden	11,248	210	1,000	276	601	69,889	54,080	1,232	306,231	9,399	25	9,148	14,641	29,394	437,209
Switzerland	4,250					5,046	3,686		163,748			15,197	792	1,825	189,498
Turkey in Europe				4,668	12,871	290,207	434,861	155	65,753			385		2,063	516,088
England	9,723	23,906		3,244	7,887	150,529	122,640	3,281	61,934	202	16,359	13,970	17,775	117,736	395,503
Scotland	322					5,116	4,252					4,500		301	9,375
TOTALS, EUROPE	$31,443	$27,549	$1,458	23,954	$89,449	987,921	$1,000,441	$5,656	$1,782,215	$25,246	$19,492	$73,143	$334,149	$288,996	$3,679,237
NORTH AMERICA															
Bermuda		$75		18	$54								410	$15	$554
British Honduras	$161	191	$5			3,358	$3,726	$201	$323	$145		$368	53	41	5,214
Canada	13,837	8,582	16,675	4,792	19,888	2,999	4,961	604	180,454	16,107	$41,454	1,565	20,351	170,974	495,452
Costa Rica	183	100	5					456	1,343			92	245	345	2,769
Guatemala	784	261		96	133	864	1,272		2,212	220			1,294	1,541	7,717
Honduras	168	770	156			24	60		1,775	19	91		540	1,647	5,226
Nicaragua	2,580		259			173	174	128	1,683				2,024	3,639	10,487
Panama	395	728	3,353	15	45	3,200	3,446	349	20,869	59		1,947	4,942	2,554	38,687
Salvador	245	14						12	545	30		171	155	660	1,832
Mexico	21,480	9,385	5,259	82	198	2,308	2,486	1,579	39,530	5,998	3,931	2,453	22,930	12,194	127,423
Miquelon, Langley, etc.				73	160	60	47							10	217
Newfoundland and Labrador	885	524	218	10,063	30,076	1,464	1,825	1,499	170	293			1,239	1,118	37,847
Barbados		23				216	212	31	2,616	61		97	249	241	3,530
Jamaica	47	165	1,841			24	34	1,163	30,856	904		54	3,490	241	38,885
Trinidad and Tobago	494	305	44						3,868	88		21	143	275	5,238
Other British West Indies	306	75		12	48	12	16		2,304	250		159	268	166	3,592
Cuba	14,276	11,653	6,316	1	8	75,395	58,776	3,982	160,960	10,658	7,739	23,617	30,551	18,525	347,061
Danish West Indies		5				1,443	1,660		1,749	47				154	3,615
Dutch West Indies								214	980			12	30		1,236
French West Indies			53						15,834	25		290	56	88	16,346
Haiti	254	426				1	1	37	2,785	48		1,302	175	301	5,329
Dominican Republic	517	12				2,020	1,243	579	10,275		647	111	1,350	1,990	16,724
TOTALS, NORTH AMERICA	$56,612	$33,294	$34,184	15,152	$50,610	93,561	$79,939	$10,834	$481,131	$35,042	$53,862	$32,259	$90,495	$216,719	$1,174,981
SOUTH AMERICA															
Argentina	$8,861	$2,340	$128	24	$120	1,116	$1,873		$138,197	$1,635		$870	$44,112	$13,337	$216,473
Bolivia	401	55							4,645				20,071	739	25,911
Brazil	10,325	3,909	1,137			4,435	4,026	$1,432	60,576	3,384		267	40,410	16,927	142,393
Chile	14,471	1,811	157	96	607	4,296	5,076	367	52,912	871		4,162	3,995	7,835	92,264
Colombia	1,273	458	269			216	133	326	8,447	483		2,528	5,350	1,436	20,703
Ecuador	1,744	80	170	4	13	2,416	1,775		5,324				710	2,087	11,903
British Guiana	85	60							2,839	850			283	18	4,135
Dutch Guiana	62								257			11		97	427
Paraguay	246												80		326
Peru	1,757	1,413	2,539			208	251		20,266	378	$1,839	39	6,322	2,047	36,851
Uruguay	286	1,552	516			864	463		47,773	2,116			5,636	8,155	66,497
Venezuela	2,281	159	264			6	3	53	11,838	50		739	9,129	2,111	26,627
TOTALS, SOUTH AMERICA	$41,792	$11,837	$5,180	124	$740	13,557	$13,600	$2,178	$353,074	$9,767	$1,839	$8,616	$136,098	$54,789	$644,510
OCEANIA															
Australia	$2,727	$4,825	$1,637	288	$979	347	$653	$15	$41,207	$3,863		$1,038	$10,082	$4,465	$71,431
New Zealand		505		36	141	66	95		48,255	475	$368	1,068	572	11,111	62,590
French Oceania									65		200				265
Other Oceania									204	15					219
Philippine Islands	31,163	6,387	5,920			5,616	7,162	11,756	131,397	14,312	18,696	9,457	13,708	7,444	257,402
TOTALS, OCEANIA	$33,890	$11,717	$7,557	324	$1,120	6,029	$7,910	$11,771	$221,128	$18,665	$19,264	$11,563	$24,362	$23,020	$391,907

EXPORTED TO	Belting. Value.	Hose. Value	Packing. Value.	Boots Pairs.	Boots Value.	Shoes. Pairs.	Shoes. Value.	Soles and Heels. Value.	Automobile Tires. Casings. Value.	Automobile Tires. Inner Tubes. Value.	Automobile Tires. Solid Tires Value.	Automobile Tires. All Others. Value	Insulated Wire and Cables Value.	All Other Manufactures of Rubber. Value.	Totals. Value
ASIA															
China	$3,84[illegible]	$5,355	$545	2,393	$6,282	12,737	$14,426	$250	$36,603	$340	.....	$1,105	$34,100	$6,943	$109,791
Kwantung	....	.....	.....	.....	.....	49,460	58,865	......	.....	..	......	.....	......	..	58,865
Chosen	[illegible]	.....	.....	...	.....	552	586	....	......	...	......	......	......	86	950
British India	120	..	11	.	.	1,475	2,007	.....	23,581	222	.....	.....	592	424	26,965
Straits Settlements	854	75	....	..	...	788	751	....	62,097	458	$15,311	....	665	5,494	85,705
Other British East Indies	......	......	......	.....	.....	......	......	.....	166	....	..	....	......	5	171
British East Indies	688	3,945	627	..	..	......	......	.....	56,717	1,075	3,835	327	9,476	7,315	84,002
French East Indies	...	...	..	....	.	...	.....	...	.....	....	..	...	......	56	56
Hongkong	9	.	160	.....	..	384	263	36	1,725	.....	..	....	11,404	1,297	14,894
Japan	37,53[illegible]	354	....	366	1,148	28,316	21,538	......	11,897	1,542	8,366	......	13,753	27,256	117,885
Russia in Asia	..	.	..	39	120	...	......	.....	.....	......	..	..	.....	165	285
Siam	.....	......	......	1	5	...	.....	..	3,675	......	.	...	......	849	4,529
Turkey in Asia	.....	....	....	....	...	1,386	1,049	.....	9,494	......	....	...	.....	4,038	14,581
TOTALS, ASIA	$37,319	$10,229	$1,351	2,799	$7,555	95,098	99,485	$286	$205,955	$3,637	$27,512	$1,432	$69,990	$53,928	$518,679
AFRICA.															
British West Africa	......	.....	....	88	$454	68	$77	$4	$33,662	$23	......	131	.....	.....	34,351
British South Africa	$12,199	....	......	....	.	413	506	....	4,627	....	.	698	6,555	22,246	46,828
British East Africa	....	.....	....	....		..	......	......	7,453	..	.	...	....	.	7,453
French Africa	....	$100	$500	..	.	...	....	..	917	...	.	..		90	1,607
Madagascar	..	...	....	..		...	...	......	.....	...	.	67	.		67
Portuguese Africa	..	.....	....		...	..	.....	.....	......	..	.	.....	....	3	3
Egypt	524	.	...		.	589	248	......	762	.	..	10	100	105	1,838
TOTALS, AFRICA	$12,723	$100	$500	88	$454	1,070	$831	$4	$47,421	$23	......	$906	$6,748	$22,438	$92,148
TOTALS	$2[illegible]3,779	$94,726	$50,230	42,441	$149,928	1,197,236	$1,202,206	$30,729	$3,090,924	$92,320	$121,969	$127,919	$661,842	$664,890	$6,501,462

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORY OF THE UNITED STATES.

	Belting, Hose, and Packing	Boots and Shoes. Pairs	Boots and Shoes. Value	Tires. Automobile Value.	Tires. All Others. Value.	Insulated Wire and Cables. Value	All Other Manufactures of Rubber. Value.	Totals Value
Hawaii	$9,305	......	......	$145,074	$5,706	....	$8,905	$168,990
Porto Rico	4,751	....	..	157,885	20,171	....	13,957	196,764
Totals	$14,056	......	......	$302,959	$25,877	......	$22,862	$365,754

(Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.)

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

January

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
UNMANUFACTURED—free				
India rubber				
From France	....		490,968	$198,476
Netherlands	....	....	1,522,588	722,320
Portugal	...	...	67,461	[illegible]
United Kingdom	11,0[illegible]	54,480	17,104,210	8,024,335
Canada	8,995	2,655	2,585	1,034
Central America	18,887	8,271	28,376	8,971
Mexico	215,774	56,307	130,655	54,167
Brazil	5,354,280	1,892,068	4,233,199	1,405,944
Peru	....	....	176,721	65,118
Other South America	43,681	21,907	275,256	85,769
British E. Indies	13,253,693	4,725,854	35,167,439	14,215,918
Dutch E. Indies	2,975,168	980,835	6,171,319	2,684,769
Other countries	1,147,531	327,935	1,056,638	466,677
Totals	23,039,209	$8,020,312	66,427,415	27,967,228
Balata	56,132	28,333	494,604	292,294
Guayule	121,101	37,138	....	....
Jelutong (Pontianak)	.....	.....	1,215,892	172,049
Gutta percha	423,567	51,777	816,999	133,742
Rubber scrap	397,290	29,656	981,719	82,406
Totals, unmanufactured	24,037,299	$8,167,216	69,936,629	$28,647,719
Chicle (dutiable)	876,432	$530,646	1,203,546	$895,678
MANUFACTURED *dutiable*—India rubber and gutta-percha	....	26,688	....	67,949
India rubber substitutes	179,200	31,506	4	5

EXPORTS OF DOMESTIC MERCHANDISE.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
MANUFACTURED—				
India rubber:				
Scrap and old	358,683	$36,198	1,315,632	$122,514
Reclaimed	492,147	89,539	385,979	62,956
Belting[1]	......		......	213,799
Hose[1]	......	623,636	....	94,726
Packing[1]	....		..	50,230
Boots[1] ....pairs	11,014	37,316	42,441	149,928
Shoes[1] ....pairs	130,513	104,217	1,197,236	1,202,206
Soles and heels[1]	....	....	.....	30,729
Tires:				
For automobiles[1]	..		..	....
Casings[1]		1,839,619	.....	3,090,924
Inner tubes[1]				92,320
Solid tires[1]				121,969
All other tires[1]		105,503		127,919
Druggists' rubber sundries		88,459		90,145
Suspenders and garters		208,965	.....	222,030
Other rubber manufactures[1]		686,483	...	664,890
Totals		$3,819,935		$6,337,285
Fountain pens ....number	16,617	14,209	35,907	37,472
Chewing gum	..	270,864	....	330,536
Insulated wire and cables[1]	....	804,481	....	661,842

EXPORTS OF FOREIGN MERCHANDISE.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
UNMANUFACTURED				
India rubber	191,740	$93,009	563,677	$247,99[illegible]
Balata	51,350	31,844	54,958	32,668
Guayule	......	....	.....	....
Jelutong (Pontianak)	.....	....	110,000	18,568
Totals, unmanufactured	243,090	$124,853	728,635	$299,258
MANUFACTURED				
Gutta percha	.....	$237	...	$115
Totals, manufactured	....	$237	.....	$115
Chicle	44,000	$20,000	..	....

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
MANUFACTURED				
To Alaska:				
Belting, hose and packing	.....	$14,749		$5,114
Boots and shoes..pairs	2,074	6,035		9,934
Other rubber goods		1,220		2,633
Totals		$22,004		$17,681
To Hawaii:				
Belting, hose and packing	..	$4,739	..	$9,305
Automobile tires	..	112,980		145,074
Other tires	....	1,359		5,706
Other rubber goods	......	11,935		8,905
Totals		$131,013		$168,990
To Porto Rico:				
Belting, hose and packing		[illegible]		4,751
Automobile tires		[illegible]		157,885
Other tires		3,770		20,171
Other rubber goods		20,253		13,957
Totals	...	$96,125		$196,764

To Philippine Islands treated as foreign commerce.

[1]Details of exports of domestic merchandise by countries during January are given on pages [illegible] of this issue.

RUBBER STATISTICS FOR THE DOMINION OF CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	December			
	1918.		1919.	
UNMANUFACTURED—Free	Pounds.	Value.	Pounds.	Value.
Rubber, gutta percha, etc.:				
From United Kingdom.	[illegible]	[illegible]	702,539	$381,687
United States	[illegible]	[illegible]	1,065,886	567,667
British East Indies:				
Ceylon	......	......	[illegible]	281,730
Straits Settlements	[illegible]	330,539	[illegible]	180,089
Dutch East Indies.....	[illegible]	45,853	...	......
Other countries	1,105	388	...	......
Totals	1,303,453	$414,994	2,550,445	$1,411,173
Rubber, recovered	214,103	$35,618	[illegible]	$41,429
Hard rubber, sheets and rods....	1,101	[illegible]	16,092	9,411
Hard rubber tubes	.	793	......	4,939
Rubber, powdered, and rubber or gutta percha scrap.	315,525	26,233	141,297	8,831
Rubber thread, not covered....	4,300	6,353	[illegible]	3,861
Rubber substitute	224,201	23,529	108,502	14,073
Totals, unmanufactured..	759,230	$93,522	[illegible]	$82,544
Balata		....	43	$63
Chicle	95,850	$58,731	310,636	260,299
MANUFACTURED—dutiable				
Boots and shoes........		$8,995	.....	$16,795
Waterproofed clothing ...		5,706		20,007
Belting, hose and packing...		22,382	...	39,243
Gloves and hot-water bottles		(*)	.	7,967
Fountain pens			(†)	6,525
Tires		[illegible]	.	113,734
Insulated wire and cables:				
Wire and cables, covered with cotton, linen, silk, rubber, etc.		11,195		11,333
as above		(‡)	...	10,011
Other manufactures		124,356		194,269
Totals, manufactured....	...	$205,105	....	$419,884

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	November.			
	1918.		1919.	
UNMANUFACTURED—	Produce of Canada.	Reexports of Foreign Goods.	Produce of Canada.	Reexports of Foreign Goods.
Crude and waste rubber........	$28,319	......	$26,792	....
MANUFACTURED				
Belting	[illegible]	.....	663	.....
Hose	[illegible]	.	17,740	....
Boots and shoes.........	63,578	1,597	235,291	686
Clothing	577	15	6,056	......
Tires	[illegible]	2,788	838,286	1,675
All other manufactures	[illegible]	19,072	20,337	2,924
Totals, manufactured	$346,305	$23,472	$1,118,373	$5,285

*Included in "Other Manufactures."
†Included in "Pens of all kinds."
‡Included in "Wire and cables," etc.

UNITED KINGDOM RUBBER STATISTICS.

IMPORTS.

	January			
	1919.		1920.	
UNMANUFACTURED	Pounds.	Value.	Pounds.	Value.
Crude rubber:				
From				
Dutch East Indies......	.....	......	[illegible]	£152,410
French West Africa.....	..	....	337	[illegible]
Gold Coast	144	£1,601	[illegible]	1,413
Other African countries....	4,437	46,182	824	8,306
East Africa (including Madagascar)	125	1,150	1,856	18,685
Peru	17	245	[illegible]	[illegible]
Brazil	18,206	213,843	9,461	108,639
British India	19,323	219,962	[illegible]	[illegible]
Straits Settlements	34,930	381,295	31,416	398,543
Federated Malay States....	30,321	357,666	[illegible]	526,304
Ceylon and dependencies...	26,035	304,272	49,144	593,765
Other Dutch possessions in Indian Seas	1,902	22,511	4,579	55,621
Other countries in East Indies and Pacific, not elsewhere specified ..	.	..	1,074	13,149
South and Central America (except Brazil and Peru)...	51	547	476	5,830
Other countries	3,589	40,165	1,355	13,565
Totals	139,080	£1,589,439	172,255	£2,091,916
Waste and reclaimed rubber.	7	£34	7,760	£20,637
Totals unmanufactured.	139,087	£1,589,473	180,015	£2,112,553
Gutta percha and balata....	27,965	£489,752	8,163	£119,233
*Rubber substitutes.........	.		4	£33

*Included in "Other Articles," Class III, T., prior to 1920.

	January			
	1919.		1920.	
MANUFACTURED	Pounds.	Value.	Pounds.	Value.
Boots and shoes..dozen pairs	[illegible]	£1,456	35,372	£69,772
Waterproofed clothing ...				130
Tires and tubes		[illegible]		351,598
Other rubber manufactures		1,951	..	117,710
Insulated wire ..				1,914
Totals		[illegible]		£541,124

EXPORTS.

UNMANUFACTURED				
Waste and reclaimed rubber	[illegible]	£7,441	[illegible]	£25,676
Rubber substitutes		7,591		13,627
MANUFACTURED				
Waterproofed clothing	.	£70,141	.....	£258,819
Boots and shoes ...dozen pairs	17,813	24,902	10,416	27,478
Insulated wire		19,322	.	112,574
Submarine cables		21,531	.	81,323
Tires and tubes............		287,414	.	475,946
Other rubber manufactures..	.	240,055	.	288,036
Totals	..	£678,397	..	£1,283,479

EXPORTS—COLONIAL AND FOREIGN.

UNMANUFACTURED				
Crude rubber				
To Russia .	....	..	83	£1,280
Sweden, Norway and Denmark	[illegible]	£21,243	1,291	11,707
Germany	...	......	5,548	55,130
Belgium	..	......	4,840	53,581
France	23,241	266,052	23,615	280,450
Spain .	[illegible]	301	316	3,812
Italy	18,539	208,874	3,059	33,668
Austria Hungary	...	...	112	1,200
Other countries in Europe	10	231	1,877	19,136
United States .	213	2,724	125,998	1,554,547
Canada ...	......	......	14,528	174,805
Other countries ..	556	8,758	2,391	30,935
Totals ..	44,283	£508,183	183,658	£2,220,251
Waste and reclaimed rubber..	33	......	125	..
Gutta percha	11	225	1,234	21,190
MANUFACTURED				
Boots and shoes..dozen pairs	1,297	2,268	609	4,359
Insulated wire ..		280	.....	..
Tires and tubes..	..	17,075	..	2,464
Other manufactures	.	5,132	......	5,714
Totals ...	..	£24,980	......	£33,737

UNITED KINGDOM RUBBER STATISTICS.

IMPORTS.

	Year Ended December 31.			
	1918.		1919.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED—				
Crude rubber:				
From—				
Dutch East Indies........	78,055	£932,287	256,554	£2,667,911
French West Africa......	3,041	25,559	639	5,538
Gold Coast	7,855	60,747	3,152	29,953
Other African countries...	64,769	602,366	32,226	310,039
Peru	8,505	94,258	11,842	120,349
Brazil	95,509	1,201,943	181,214	1,997,385
British India	44,009	521,552	113,012	1,240,460
Straits Settlements.......	286,973	3,259,738	673,511	7,107,882
Federated Malay States...	163,996	1,952,257	628,622	6,628,845
Ceylon and dependencies..	271,730	3,172,601	334,981	3,605,033
Other countries..........	24,827	289,390	46,613	498,339
Totals	1,049,269	£12,112,698	2,282,366	£24,211,734
Waste and reclaimed rubber.	2,417	2,961	49,924	135,611
Totals unmanufactured	1,051,686	£2,115,659	2,332,290	£24,347,395
Gutta percha	105,491	£1,973,587	110,790	£2,142,354
MANUFACTURED—				
Boots and shoes..dozen pairs	30,841	£241,029	170,610	£294,338
Waterproofed clothing....	......	22,117	......	15,585
Automobile tires and tubes..	......	602,645	......	2,053,423
Motorcycle tires and tubes..	......	15,573	.	37,892
Bicycle tires and tubes......	......	20,414	......	51,676
Carriage tires and tubes....	......	242	......	5,998
Insulated wire	......	2,220	......	7,830
Submarine cables		......	......	38
Totals	......	£904,240	......	£2,466,780

EXPORTS.

UNMANUFACTURED—				
Waste and reclaimed rubber.	71,082	£183,858	104,548	£242,138
MANUFACTURED—				
Waterproof clothing........	......	478,788	......	1,730,172
Boots and shoes..dozen pairs	89,069	124,400	130,864	262,373
Insulated wire	......	90,088	......	828,058
Bicycle tires and tubes......	......	260,554	......	1,333,233
Carriage tires and tubes....	......	153,304	......	246,790
Automobile tires and tubes..	......	1,163,623	......	2,421,906
Motorcycle tires and tubes..	......	153,407	......	260,151
Submarine cables	......	577,998	......	622,452
Other rubber manufactures..	......	1,483,035	......	2,832,638
Totals	......	£4,485,197	......	£10,537,773

UNITED KINGDOM RUBBER STATISTICS—(Continued).

EXPORTS—COLONIAL AND FOREIGN.

Year Ended December 31

	1918.		1919.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED				
Crude Rubber				
To Russia			1,687	£22,151
Belgium			84,173	[illegible]
France	[illegible]	[illegible]	239,532	[illegible]
Italy	[illegible]	888,995	[illegible]	1,091,585
United States of America	58,701	680,351	638,635	6,779,508
Other Countries	20,810	262,289	265,948	2,819,457
Totals	376,287	£4,527,215	1,329,919	£14,003,575
Waste and Reclaimed	798	2,825	4,455	17,382
Total, unmanufactured	377,085	£4,530,040	1,334,374	£14,020,957
Gutta percha	2,478	43,697	14,005	215,775
MANUFACTURED				
Boots and shoes...dozen pair	893	£4,257	4,871	£10,195
Waterproof clothing	......	121	......	1,188
Insulated wire	......	3,224	......	7,905
Automobile tires and tubes	......	56,522	......	111,233
Motorcycle tires and tubes	......	897	......	7,276
Bicycle tires and tubes	......	9,291	......	5,243
Carriage tires and tubes	......	1,639	......	1,495
Totals	......	£75,951	......	£144,535

THE MARKET FOR RUBBER SCRAP.

NEW YORK.

EARLY IN THE MONTH the rubber scrap market labored under adverse conditions such as shipping difficulties and lack of interest on the part of reclaimers in anticipation of lower prices incident to the spring collections of tires and shoes. Already there is a decreasing firmness noted in the prices asked for both these grades.

The crude rubber market has been quiet and there has been no beneficial effect on scrap rubber. Consumers of scrap are favoring the scrap at present which is a good thing for the trade in view of the tremendous supplies in that line.

QUOTATIONS FOR CARLOAD LOTS DELIVERED.

March 25, 1920.

Prices subject to change without notice.

BOOTS AND SHOES:			
Arctic tops	lb.	$0.01 @	
Boots and shoes	lb.	.07⅞ @	.08⅛
Trimmed arctics	lb.	.05½ @	.05¾
Untrimmed arctics	lb.	.06½ @	.06¾
HARD RUBBER			
Battery jars, black compound	lb.	.01 @	
No. 1, bright fracture	lb.	.23 @	.24
INNER TUBES:			
No. 1	lb.	.17½ @	.17¾
Compounded	lb.	.09⅞ @	.10
Red	lb.	.08½ @	.08¾
MECHANICALS:			
Black scrap, mixed, No. 1	lb.	.03½ @	.04
No. 2	lb.	.03 @	
Car springs	lb.	.03½ @	.04
Heels	lb.	.03 @	[illegible]
Horseshoe pads	lb.	.03 @	.03½
Hose, air brake	lb.	.04¼ @	
fire, cotton lined	lb.	.01½ @	.01¾
garden	lb.	.01½ @	.01¾
Insulated wire stripping, free from fiber	lb.	.03½ @	.04
Matting	lb.	.01¼ @	.01½
Red packing	lb.	.05½ @	.06
Red scrap, No. 1	lb.	.09 @	.10
No. 2	lb.	.06¾ @	.07¼
White scrap No. 1	lb.	.08 @	.09
No. 2	lb.	.10 @	.11
TIRES:			
PNEUMATIC—			
Auto peelings	lb.	.04½ @	.05
Bicycle	lb.	.02¾ @	.03
Standard white auto	lb.	.04⅝ @	.04¾
Standard mixed auto	lb.	.03¾ @	
Stripped, unguaranteed	lb.	.02½ @	.02¾
White, G. & G., M. & W., and U. S.	lb.	.04¾ @	.05
SOLID—			
Carriage	lb.	.04 @	.04¼
Irony	lb.	.01 @	
Truck	lb.	.03½ @	.03¾

THE MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

AMERICAN COTTON. The market for cotton has continued to be remarkably dull, sales being recorded on two days only. The spot price for middling uplands cotton was 40 cents on March 1, it rose gradually through the next ten days to 41 cents and stayed at that price without variation and with no sales for nearly two weeks; at the end of the month there were fluctuations, the price going to 43.25 cents on March 23, and dropping again to 42 cents, the price quoted March 24. The boll weevil is apparently spreading throughout the South. The English threat of ceasing to purchase American cotton has not been taken seriously on either side of the Atlantic.

EGYPTIAN COTTON. During February the Alexandria market fluctuated violently, owing to speculation, largely among the native merchants. The prices were so high that export houses ceased to deal in futures. They are believed to have practically filled all their contracts. The actual sales have been very small and the spot market dull, Sakellarides bringing $3 to $4 above the future price toward the end, though $8 to $10 more was paid for it in the middle of the month. The extreme future prices reached for March delivery were $198 and $165 per cantar, the last quotation being $181.50 for March and $140 for November. There is no doubt that there is a shortage of Sakellarides that can be delivered and spinners and exporters are holding off until the market settles.

During the last week of March it was reported that Sakellarides has recovered, after the recent decline, and is holding firm in Alexandria at $1.37 for the better grades. This growth still remains dear with a high basis over contracts, but uppers and brown cottons are neglected.

Arizona Cotton. This year's crop of Pima has all been sold with the exception of a limited number of bales of very low grade cotton of indifferent staple. The last prices were around \$1.05. Seventy cents a pound has been bid in Arizona for new crop cotton without bringing any response. New crop has been offered in the East at \$1.02 with like results. Reports from Phoenix indicate a somewhat increased acreage for next season and optimists are predicting a 50,000 bale crop.

Sea Island Cotton. Price for average extra choice is now \$1.10 with very little cotton offered. It is probable that there will be sufficient demand between now and new crop to absorb practically all of the stock on hand. This means no carry-over into next season. A very small acreage will be planted next year in South Carolina, Georgia and Florida to Sea Island cotton. Probably the crop will not amount to more than 9,000 bales.

Ducks and Drills. The market continues firm, the demand being much greater than the supply, as will continue to be the case so long as there is a scarcity in the raw material. The high prices continue to be quoted without a notable change.

Raincoat Cloth. The trade has been rather quiet as manufacturers have enough stock on hand to keep them going for some months to come. Prices have advanced, however, because large gray goods operators are buying heavily, both spot and futures.

Sheetings. After a lull of some weeks buying has started again and the buyers are finding that goods for near delivery are scarce. All the mills are busy and have orders for all they can do comfortably for some time to come.

Tire Fabrics. The market for tire fabrics is practically at a standstill, as there are no goods for sale and none are to be had for from four to six months from now. What sales occur are only of odd lots. No dealers are covering 1921 owing to the high prices demanded. The yarn manufacturers ask exorbitant prices and the fabric manufacturers who buy their goods must add these prices to their own.

NEW YORK QUOTATIONS.

March 25, 1920.

Prices subject to change without notice.

ASBESTOS CLOTH:				
Brake lining, 2½ lbs. sq. yd., brass or copper insertion	*lb.*	\$1.00	@	1.10
2¼ lbs. sq. yd., brass or copper insertion	*lb.*	1.10	@	1.15
BURLAPS:				
32—7-ounce	100 *yards*		@	
32—8-ounce			@	
40—7½-ounce		10.50	@	
40—8-ounce		10.75	@	
40—10-ounce		15.25	@	
40—10½-ounce		15.50	@	
45—7½-ounce		15.25	@	
45—8-ounce		15.50	@	
48—10-ounce		19.00	@	
DRILLS:				
38-inch 2.00-yard	*yard*	.41	@	
40-inch 2.47-yard		.34½	@	
52-inch 1.90 yard		.55¼	@	
52-inch 1.95-yard		.53⅞	@	
60-inch 1.52-yard		.75¾	@	
DUCK:				
CARRIAGE CLOTH:				
38-inch 2.00-yard enameling duck	*yard*	.45	@	
38-inch 1.74-yard		.52⅞	@	
72-inch 16.66-ounce		1.25	@	
72-inch 17.21-ounce		1.34	@	
MECHANICAL:				
Hose	*pound*	.76	@	
Belting		.76	@	
HOLLANDS, 40-INCH:				
Acme	*yard*		@	
Endurance			@	
Penn			@	
OSNABURGS:				
40-inch 2.35-yard	*yard*	.35	@	
40-inch 2.48-yard		.33½	@	
37½-inch 2.42-yard		.34	@	
RAINCOAT FABRICS:				
COTTON:				
Bombazine 64 x 60	*yard*	.30	@	
60 x 48		.27	@	
Cashmeres, cotton and wool, 36-inch, tan		1.15	@	
Twills 64 x 72		.46	@	
64 x 102		.48	@	
Twill, mercerized, 36-inch, blue and black		.62½	@	
tan and olive		.60	@	
Tweed		.90	@	1.50
printed		.27½	@	
Plaids 60 x 48		.28½	@	
56 x 44		.27	@	
Repp		.45	@	.50
Surface prints 60 x 48		.29½	@	
64 x 60		.32	@	
IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING—PLAIN AND FANCIES:				
63-inch, 3½ to 7½ ounces	*yard*	1.45	@	3.90
36-inch, 2¾ to 5 ounces		.85	@	2.25
IMPORTED PLAID LINING (UNION AND COTTON:)				
63-inch, 2 to 4 ounces	*yard*	.95	@	1.90
36-inch, 2 to 4 ounces		.60	@	1.15
DOMESTIC WORSTED FABRICS:				
36-inch, 4½ to 8 ounces	*yard*	.85	@	1.90
DOMESTIC WOVEN AND PLAID LININGS (COTTON):				
36-inch, 3¾ to 5 ounces		.27	@	.35
SHEETINGS, 40-INCH:				
48 x 48, 2.35-yard	*yard*	.37½	@	
48 x 48, 2.50-yard		.35	@	
48 x 48, 2.70-yard		.32½	@	
48 x 48, 2.85-yard		.32	@	
64 x 68, 3.15-yard		.33	@	
56 x 60, 3.60-yard		.29½	@	
48 x 44, 3.75-yard		.27	@	
SILKS:				
Canton, 38-inch	*yard*	.75	@	
Schappe, 36-inch		1.00	@	
STOCKINETTES:				
SINGLE THREAD:				
3½ Peeler, carded	*pound*		@	
4½ Peeler, carded		1.15	@	1.15¼
6½ Peeler, combed		1.80	@	
DOUBLE THREAD:				
Zero Peeler, carded	*pound*	.98	@	.98½
3½ Peeler, carded		1.04	@	1.04½
6½ Peeler, combed		2.70¼	@	2.70½
TIRE FABRICS:				
BUILDING:				
17¼-ounce Sakellarides, combed	*pound*	2.50	@	2.75
17¼-ounce Egyptian, combed		2.40	@	2.69
17¼-ounce Egyptian, carded		2.30	@	2.50
17¼-ounce Peelers, combed		2.30	@	2.50
17¼-ounce Peelers, carded		1.60	@	1.75
CHAFER:				
9¼-ounce Sea Island	*pound*	3.00	@	
9¼-ounce Egyptian, carded		2.50	@	
9¼-ounce Peeler, carded		1.50	@	1.60

SEA ISLAND CROP MOVEMENT.

From August 1, 1919, to February 27, 1920.

	Receipts. 1919-20.	1918-19.
Stock on hand, August 1, 1920— Savannah, 4,901; Charleston, 90 ... *bales*	4,991	15,764
Received at Savannah (gross)	10,553	10,722
Received at Charleston	2,981	8,639
Received at Jacksonville	10,309	8,659
Received at Brunswick	.....	.....
Received at Norfolk	.....	.....
Total	28,834	43,784
Less exports	24,504	31,003
Stock February 27, 1920— Savannah, 3,448; Charleston, 882	4,330	12,781
Crop in sight at all ports to date	23,383	28,020

EXPORTS.

From—	To Great Britain.	Continent.	North Mills.	South Mills.	Totals.
Savannah	...	443	9,823	1,740	12,006
Charleston	...	....	2,189	....	2,189
Jacksonville	...	......	10,309	......	10,309
Brunswick	..	......	......	......	......
Norfolk	...	......	......	......	......
Total	...	443	22,321	1,740	24,504
1918-19	370	.....	29,905	728	31,003
	*370	†443	*7,584	†1,012	*6,499

*Decrease. †Increase.

(Compiled by John Malloch & Co., Savannah, Georgia.)

EGYPTIAN COTTON CROP MOVEMENT.

FROM AUGUST 1, 1919, TO JANUARY 21, 1920

		1919-1920.	1918-1919.	1917-1918.
To Liverpool	bales	186,320	142,184	120,198
Manchester		111,382	71,836	83,799
Other United Kingdom ports		145	5,537	19,542
Total shipments to Great Britain		297,847	219,557	223,539
To France		31,992	6,679	10,309
Spain		8,730	10,140	1,484
Italy		14,648	25,587	17,946
Belgium		[illegible]		
Switzerland		8,688	7,323	....
Holland		566	.....	.....
Portugal		460	....	....
Germany		240	....	....
Austria		7,678	....	....
Greece		104	3,713	500
Turkey and other countries		73	....	....
Total shipments to Continent		70,409	53,442	30,239
To United States		182,591	11,792	13,530
Japan		13,724	7,903	12,464
Total shipments to all parts		564,571	292,694	279,772
Total crop (interior gross weight), cantars[1]		....	4,826,342	6,315,841

[1]One cantar equals 98 pounds.

(*Compiled by Davies, Benachi & Co.*)

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

NEW YORK.

THE ACTIVE DEMAND and short supply which characterizes practically the entire list of rubber workers' chemicals and compounding ingredients has resulted in a sellers' market greatly to the disadvantage of the consumers.

In some lines producers complain that consumers are yielding to the short supply condition and are ordering beyond their requirements which forces producers to cut down requisitions or to raise prices.

Lead pigments have advanced owing to condition of the pig lead prices. Relief can come only with increased output of the metal, and is expected shortly.

The condition of the rubber trade as regards the supply of hexamethylene-tetramine, the popular organic accelerator, is one of acute shortage. The material is widely distributed to users in very limited amounts and at extraordinarily high figures, as high as $3 per pound being paid. Deliveries on contract business are made at prices current at the date of shipment. The restricted output is attributable to the short supply of formaldehyde and wood alcohol.

ANILINE OIL. Stocks are small and prices firm, tending upward.

BARYTES. The stock shortage seems to be contingent on car shortage which is not susceptible to rapid improvement. Other production difficulties are apparently being eliminated.

BENZOL. Makers are able to supply the bulk of the demand which is fairly heavy. Prices are easier, 90 per cent is quoted 25 cents per gallon.

BLACKS. The situation with regard to both lampblack and carbon black is acute. The supply is not equal to the demands of consumers. It is reported that rubber manufacturers have been forced to substitute graphite wherever possible.

DRY COLORS. Imported earth colors are somewhat scarce. Interest centers in the volume of European shipments, particularly from Germany.

LITHARGE. The demand is very active and supplies insufficient. A rise of one-half cent per pound was made about the middle of the month.

LITHOPONE. Output is booked months ahead. Spot stocks are very small. Producers are not contracting and prices have been advanced to eight cents for car lot.

SUBLIMED LEAD. As with other lead pigments, the supply is inadequate to the demand. Early in the month an advance of ¾-cent per pound took effect. Producers are endeavoring to stabilize prices which are dependent on that for pig lead which has continued to rule high.

SULPHUR. The demand is steady at firm prices.

WHITING. Stocks are low and receipts of chalk not satisfactory.

ZINC OXIDE. There is a vigorous demand at firm prices.

NEW YORK QUOTATIONS.

MARCH 25, 1920

Prices subject to change without notice.

ACCELERATORS, ORGANIC.				
Accelerene, New York	lb.	$4.75	@	
Accelemal	lb.	.55	@	.57½
Aldehyde ammonia crystals	lb.	1.90	@	2.00
Aniline oil	lb.	.34	@	.36
Excellerex	lb.	.65	@	.75
Hexamethylene tetramine (powdered)	lb.	1.90	@	2.00
N. C. C.	lb.	.50	@	
No. 999	lb.	22½	@	
Paraphenylenediamine	lb.	2.50	@	3.00
Thiocarbanilide	lb.	.55	@	.75
Velosan	lb.	3.00	@	3.10
ACCELERATORS, INORGANIC.				
Lead, dry red (bbls.)	lb.	.12¼	@	
sublimed blue (bbls.)	lb.	.10	@	
sublimed white (bbls.)	lb.	.10	@	
white, basic carbonate (bbls.)	lb.	.10½	@	
Lime, flour	lb.	.02¼	@	.02½
Litharge, domestic	lb.	.11¾	@	
sublimed	lb.	.12	@	
imported	lb.	.11½	@	.12½
Magnesium, carbonate, light technical	lb.	.12	@	0.13
oxide, calcined light	lb.	.65	@	0.70
calcined medium light	lb.	.25	@	0.30
calcined heavy	lb.	.07½	@	0.09
calcined commercial (magnesite)	lb.	.04	@	0.05
ACIDS.				
Acetic, 28 per cent (bbls.)	cwt.	2.75	@	3.00
glacial, 99 per cent (carboys)	cwt.	12.00	@	12.50
Cresylic (97% straw color) (drums)	gal.	.95	@	
(95% dark) (drums)	gal.	.85	@	
Muriatic, 20 degrees	cwt.	1.75	@	2.00
Nitric, 36 degrees	cwt.	6.00	@	6.50
Sulphuric, 66 degrees	ton	22.00	@	
ALKALIES.				
Caustic soda, 76 per cent (bbls.)	lb.	.06	@	.07
Soda ash (bbls.)	lb.	.03¾	@	
COLORS.				
Black:				
Bone, powdered	lb.	.06	@	.12
granulated	lb.	.11	@	
Carbon black (sacks, factory)	lb.	.12	@	.25
Drop	lb.	.05½	@	.15
Ivory black	lb.	.16	@	.30
Lampblack	lb.	.15	@	.45
Oil soluble aniline	lb.	1.25	@	
Rubber black	lb.	.08½	@	
Blue:				
Cobalt	lb.	.25	@	.30
Prussian	lb.	.90	@	
Ultramarine	lb.	.18	@	.40
Brown:				
Iron oxide	lb.	.04	@	.06
Sienna, Italian, raw and burnt	lb.	.05⅜	@	.15
Umber, Turkey, raw and burnt	lb.	.05½	@	.08
Vandyke	lb.	.10	@	.15
Green:				
Chrome, light	lb.	.39	@	.50
medium	lb.	.40	@	.50
dark	lb.	.60	@	
commercial	lb.	.15	@	
Oxide of chromium (casks)	lb.	.90	@	
Red:				
Antimony, crimson, sulphuret of (casks)	lb.	.40	@	
crimson "Mephisto" (casks)	lb.	.60	@	
crimson, "R. M. P."	lb.	.60	@	
Antimony, golden sulphuret of (casks)	lb.	.25	@	.35
golden sulphuret (States)	lb.	.30	@	.35
golden, "Mephisto" (casks)	lb.	.33	@	
golden, "R. M. P."	lb.	.33	@	
red sulphuret (States)	lb.	—	@	
vermilion sulphuret	lb.	.55	@	
Arsenic, red sulphide	lb.	.18	@	
Indian	lb.	.10	@	.15
Red excelsior	lb.	.12	@	.14
Toluidine toner	lb.	3.75	@	
Iron oxide, reduced grades	lb.	.04¾	@	.12
pure bright	lb.	.15	@	.18
Spanish bright	lb.	.04¼	@	.07
Venetian	lb.	.02	@	.06
Oil soluble aniline, red	lb.	2.00	@	
orange	lb.	1.75	@	
Oximony	lb.	.18	@	
Vermilion, American	lb.	.25	@	.30
artificial	lb.	.35	@	
English quicksilver	lb.	1.60	@	1.65

White:

Aluminum bronze, C. P.	lb.	[illegible] @
superior	lb.	[illegible] @
Lithopone, domestic	lb.	.07¾ @ .09
Ponolith (carloads, factory)	lb.	@
Rubber-makers' white	lb.	11¼ @
Zinc oxide, Horsehead (less carload, factory):		
"XX red"	lb.	[illegible] @ .11
"Special"	lb.	.11¼ @
French process, red seal	lb.	.11¼ @ .11¾
green seal	lb.	.12¼ @ .12¾
white seal	lb.	.13 @ .13¾
(States)	lb.	@
Azo, ZZZ, lead free (carload factory)	lb.	.09½ @ .10
ZZ, under 5% leaded (carload factory)	lb.	.09 @ .09½
Z, 8-10% leaded (carload factory)	lb.	.08¼ @ .08¾

Yellow:

Cadmium, sulphide, yellow, light, orange	lb.	2.00 @
red	lb.	1.85 @
Chrome, light and medium	lb.	.30 @
Ochre, domestic	lb.	.03 @ .07
imported	lb.	.05 @ .07½
Oil, soluble aniline	lb.	2.00 @
Zinc chromate	lb.	.40 @

COMPOUNDING INGREDIENTS.

Aluminum flake (f. o. b. New York)	ton	40.00 @ 43.50
silicate	ton	25.00 @ 35.00
Ammonia carbonate, powdered	lb.	.17¼ @
Asbestine (carloads)	ton	30.00 @
Asbestos (bags)	ton	— @
Barium, carbonate, precipitated	ton	85.00 @
sulphide, precipitated	lb.	.05 @
dust	ton	95.00 @
Barytes, pure white	ton	35.00 @ 40.00
Barytes, off color	ton	22.50 @
Basofor	lb.	.05 @
Blanc fixe	lb.	.05 @
Bone ash	lb.	.10 @
Carrara filler	ton	25.00 @ 35.00
Chalk, precipitated, extra light	lb.	.05 @ .05½
heavy	lb.	.04 @ .04½
Blue Ridge	ton	20.00 @
China clay, Dixie	ton	20.00 @
domestic	ton	18.50 @ 20.00
imported	lb.	.03 @ .05
Shawnee	ton	20.00 @
Cotton linters, clean mill run, f. o. b. factory	lb.	.03½ @
Fossil flour (powdered)	ton	65.00 @ 70.00
(bolted)	ton	75.00 @ 80.00
Diatomite	lb.	.03 @ .04
Glue, high grade	lb.	.35 @ .40
medium	lb.	.30 @ .35
low grade	lb.	.20 @ .25
Graphite, flake (400-pound bbl.)	lb.	.10 @ .30
amorphous	lb.	.04 @ .08
Ground glass FF. (bbls.)	lb.	.03 @
Infusorial earth (powdered)	ton	[illegible] @ 70.00
(bolted)	ton	75.00 @ 80.00
Liquid rubber	lb.	.18 @
Mica, powdered	lb.	.08½ @ .09
Pumice stone, powdered (bbl.)	lb.	.05 @
Rotten stone, powdered	lb.	.02½ @ .04½
Rubber paste	[illegible]	.18 @ .22
Rub-R-Glu	lb.	@
Silex (silica)	ton	[illegible] @ 40.00
Starch, powdered corn (carload, bbls.)	cwt.	5.34 @
(carload, bags)	cwt.	5.12 @
Talc, powdered soapstone	ton	[illegible] @ 25.00
Terra blanche	[illegible]	[illegible] @ 30.00
Tripoli earth, air-floated	ton	50.00 @
White	[illegible]	52.50 @
Tyre-lith	ton	[illegible] @
Whiting, Alba (carloads)	cwt.	.80 @ .90
Columbia	cwt.	.80 @
commercial	cwt.	[illegible] @
English cliffstone	cwt.	[illegible] @
gilders	cwt.	[illegible] @
Paris, white, American	cwt.	1.75 @
Quaker	ton	[illegible] @
Super	[illegible]	30.00 @ 32.50
Wood pulp, imported	lb.	.03¼ @
XXX	[illegible]	[illegible] @
X	[illegible]	[illegible] @
Wood flour, American	lb.	[illegible] @

MINERAL RUBBER.

Elaterite	[illegible]	[illegible] @ 63.00
Gilsonite	ton	[illegible] @ 65.00
Genasco (carloads, factory)	ton	[illegible] @
(less carloads, factory)	ton	62.00 @
Hard hydrocarbon	ton	[illegible] @
K-X	ton	[illegible] @
K. M. R.	ton	45.00 @ [illegible]
M. R. X	ton	[illegible] @
Pioneer, carload, factory	ton	50.00 @
less carload, factory	ton	[illegible] @
Raven M. R.	ton	[illegible] @ [illegible]
Refined Elaterite	ton	175.00 @
Richmond	ton	75.00 @
No. 64	ton	44.00 @
318/320 M. P. hydrocarbon	ton	[illegible] @
Robertson, M. R. Special (carloads, factory)	ton	80.00 @
M. R. (carloads, factory)	ton	57.50 @
M. R. (less carloads, factory)	[illegible]	[illegible] @
Walpole rubber flux (factory)	lb.	.05 @

OILS.

Avolas compound	[illegible]	[illegible] @ .15
Castor, No. 1, U. S. P.	lb.	[illegible] @
No. 3, U. S. P.	lb.	[illegible] @
Corn, refined Argo	cwt.	[illegible] @
Cotton	lb.	[illegible] @
Glycerine (98 per cent)	lb.	.23½ @ .24
Glycerole	lb.	.55 @
Linseed, raw (carloads)	gal.	1.77 @
Linseed compound	gal.	.85 @
Palm Lagos	lb.	[illegible] @ .20
Peanut	lb.	.26 @
Petrolatum	lb.	[illegible] @
Petroleum grease	lb.	[illegible] @
Pine, steam distilled	gal.	1.65 @
Rapeseed, refined	lb.	.22 @
blown	lb.	.22½ @
Rosin	gal.	[illegible] @ [illegible]
Soya bean	lb.	.19 @
Tar	gal.	[illegible] @ .42

RESINS AND PITCHES.

Balsam, fir	gal.	[illegible] @
Cantella gum	lb.	.55 @
Tar, retort	bbl.	[illegible] @ 15.50
kiln	bbl.	15.00 @
Pitch, Burgundy	lb.	.08¾ @
coal tar	lb.	.01¼ @
pine tar	lb.	.04 @
ponto	lb.	.14 @
Rosin	bbl.	16.95 @ 21.75
granulated	lb.	None
fused		None
Rosin, K	bbl.	20.00 @
strained	bbl.	18.00 @
Shellac, fine orange	lb.	1.55 @ 1.65

SOLVENTS.

Acetone (98.99 per cent drums)	lb.	.16 @
methyl (drums)	gal.	[illegible] @
Benzol, water white	gal.	[illegible] @ .30½
Beta-naphthol, resublimed	lb.	1.05 @ 1.10
ordinary grade	lb.	.53 @
Carbon bisulphide (drums)	lb.	.06 @ .08
tetrachloride (drums)	lb.	.11 @ .13
Naphtha, motor gasoline (steel bbls)	gal.	.28½ @
72 @ 76 degrees (steel bbls.)	gal.	.38¼ @
70 @ 72 (steel bbls.)	gal.	.36½ @
68 @ 70 degrees (steel bbls.)	gal.	.35½ @
V. M. & P. (steel bbls.)	gal.	.27½ @
Toluol, pure	gal.	[illegible] @ .33½
Turpentine, spirits	gal.	2.16 @ 2.30
wood	gal.	1.60 @
Osmaco reducer	gal.	.40 @
Xylol, pure	gal.	[illegible] @ .45
commercial	gal.	[illegible] @ .40

SUBSTITUTES.

Black	lb.	.10 @ .22
White	lb.	[illegible] @ .24
Brown	lb.	.15 @ .23
Brown factice	lb.	.12 @ .23
White factice	lb.	[illegible] @ .25
Paragol, soft and medium (carloads)	cwt.	18.58 @
hard	cwt.	18.08 @

VULCANIZING INGREDIENTS.

Lead, black hyposulphite (Black Hypo)	lb.	.39 @
Orange mineral, domestic	lb.	.15¼ @
Sulphur chloride (drums)	lb.	.07 @
Sulphur, flour, Brooklyn brand (carloads)	cwt.	3.40 @
[illegible]	[illegible]	3.40 @
[illegible]	[illegible]	[illegible]
R. M. "S[illegible]" [illegible]	[illegible]	[illegible] @ .04
R. M. "Superfine" [illegible]	[illegible]	[illegible] @ .03

(See also Colors—Antimony.)

WAXES.

Wax, beeswax, white	lb.	[illegible]
ceresin, white	lb.	[illegible]
carnauba	lb.	[illegible]
ozokerite, black	lb.	[illegible]
green	lb.	[illegible]
Montan	lb.	[illegible] @ .32
paraffine, refined 118/120 m. p. (cases)	lb.	[illegible]
123/125 m. p. (cases)	lb.	[illegible]
128/130 m. p. (cases)	lb.	[illegible]

India Rubber World
Founded 1889

Vol. 62 APRIL 1, 1920 No. 1

TABLE OF CONTENTS.

Pages

Editorials:
- Penny Wisdom 403
- Clean Rubber at the Source 403-404
- A Census for Safety 404
- It Killed the Paper Sole 404
- Kansas Strikes at General Strikes 404
- Tire Production for 1920 404
- Minor Editorials 404

Is Hard Rubber Wood a Dream? .... Illustrated 405-406

The Position of Plantation Rubber in 1919 406

The Effect of Location on Prosperity of American Rubber Industry
By L. W. Alwyn-Schmidt. Chart 407-409

New Uses for Old Tires and Tubes .... Illustrated 410-412

Electrical Yarns .... Illustrated 412

Some Labor Problems in the Rubber Industry 413-414

Rubber Tariffs of Europe 415-419

Government Standard Specifications for Rubber Tires, Tire Repairs and Accessories—II 419-422

Life on a Sumatra Rubber Plantation. .... Illustrated 423-424

Colors and Pigments in Rubber Compounds. By Calvin Stitt 425-426

A New Rapid Method for the Determination of Sulphur in Rubber Compounds.
By A. M. Munro, M. A., A. I. C., F. C. S. 426

Chemistry:
- What the Rubber Chemists Are Doing 427-428
  The Determination of Cellulose in Rubber Goods. Determination of Nitrogen in Crude Rubber. The Constitution of Vulcanized Rubber. Synthetic Rubber from Petroleum. Action of Phenol in Reclaiming.
- Chemical Patents 428-429
- Laboratory Apparatus .... Illustrated 429

Machines and Appliances .... Illustrated 430-431
Rubber Band Cutting Machine. The Curtis Air Compressor. Herman Tire-Building Machines. Elapsed Time Recorder. Mineral Rubber Cracker. Indicating Calipers.

Machinery Patents .... Illustrated 431-432
Molds for Making Rubber Articles. Process of Treating Tire Fabric. Method and Apparatus for Making Bicycle Tires. Other Machinery Patents.

Process Patents 432

New Goods and Specialties .... Illustrated 433-434
Watch-Case Telephone Receiver. Biff, a New Game. Rubber Boot with Silk Top. Tire Patch Applied with Fuse. "Kewpie" Baby Pants. Interchangeable, Detachable Heel Lifts. Tire Valve and Gage in One. "Air-Peds" for Heels and Soles. A Late Cord Tire. "Porcupine" Blow-Out Patch. New Tire Accessories. An Office and Household Convenience. Another Supersize Cord Tire.

Practical Advice to Repairmen .... By A. B. Zwebell 435-436

Interesting Letters from Our Readers 436-437

New Trade Publications 437

Editor's Book Table 437-438
"Time Studies as a Basis for Rate Setting." "Heaton's Annual, 1920." "For a Better America."

The Obituary Record 438-439
A. J. Mayberry (Portrait). Judge D. A. Doyle. Dr. C. K. Cole. H. M. Royal. M. B. Newcomb. M. F. Murphy. C. F. Luders (Portrait). Mrs. F. E. Thomas. S. Kraus.

Inquiries and Trade Opportunities 439-440

Judicial Decisions 440

American Rubber Trade—News Notes and Personals .. 441-454
- John T. Christie .... Portrait and Sketch 409
- Dividends 441
- New Incorporations 441-442
- E. F. Jones .... Portrait and Sketch 442
- The Republic Rubber Corporation .... Illustrated 442-443
- The B. F. Goodrich Co., Annual Report 443
- Hood Rubber Co., Statement 443
- Edward S. Babcox .... Portrait and Sketch 450
- Erie Tire & Rubber Co .... Illustrated 451
- C. E. Cook .... Portrait and Sketch 451
- Eastern and Southern Notes 445-446
- New Jersey .... By Our Correspondent 446-447
- Massachusetts .... By Our Correspondent 447-448
- Rhode Island .... By Our Correspondent 448-449
- Ohio .... By Our Correspondent—Illustrated 449-451
- Mid-Western Notes .... By Our Correspondent 451-453
- Mid-West Rubber Manufacturers' Association 453
- Pacific Coast. By Our Correspondent—Illustrated 453-454
- Rubber Association of America—Activities of, The 455-456

Foreign Rubber News:
- Great Britain .... By Our Correspondent 457-458
- French Rubber Associations 458
- Japan .... By Our Correspondent—Illustrated 458-459
- Foreign Customs Changes 459

Patents Relating to Rubber 460-461
United States. Canada. United Kingdom. France. Germany. Australia. New Zealand.

Trade Marks 461-462
United States. Canada.

Designs .... Illustrated 462
United States.

The River of Rubber .... Illustrated 464

Markets:
- Crude Rubber 465
  - Highest and Lowest New York Prices 465
  - Amsterdam Rubber Market 466
  - Antwerp Rubber Market 466
  - Singapore Rubber Report 466
- Reclaimed Rubber 465
- Rubber Scrap 473
- Cotton and Other Fabrics 473-474
- Chemicals and Ingredients 476-477

Statistics:
- Antwerp Rubber Arrivals 468
- Brazil, Pará and Manáos Rubber Exports 469
- Canada, Statistics for December, 1919 472
- Ceylon Rubber Imports and Exports 469
- Cotton Statistics 474-476
- Deli (Sumatra) Rubber Exports for Ten Months Ended October, 1919 469
- Federated Malay States Rubber Exports 469
- Java Rubber Exports for Twelve Months Ended December 1919 469
- Straits Settlements Rubber Exports 469
- United Kingdom Statistics for January, 1920 472-473
- United States:
  - Crude Rubber Arrivals at Atlantic and Pacific Ports as Stated by Ships' Manifests 466-468
  - Imports by Months for 1920 469
  - Exports During January, 1920 (By Countries) .470-471
  - Statistics for January, 1920 471

INDIA RUBBER WORLD

FOUNDED 1889

AOUTCHOUC — HEVEA BRASILIENSIS — DICHOPSIS GUTTA — GUTTA-PERCHA

U. S. Pat. Off. Reg. United Kingdom

Edited by HENRY C. PEARSON

Vol. LXII. No. 2. MAY 1, 1920 35 CENTS $3.00 Per Year. $3.50 Abroad.

... October 4, 1889, at the post office at New York, N. Y., under the Act of March 3, 1879.

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC GUTTA PERCHA

Reg. United States Pat. Off. Reg. United Kingdom.

Published on the 1st of each month by

THE INDIA RUBBER PUBLISHING CO.
No. 25 West 45th Street, New York.
Telephone—Bryant 2576.
CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, F.R.G.S., Editor

Vol. 62. MAY 1, 1920 No. 2

Subscription: $3.00 per year, $1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, $3.50 (or equivalent funds) per year, postpaid.

Advertising: Rates will be made known on application.

Remittances: Should always be made by bank draft. Post Office or Express money order on New York, payable to The India Rubber Publishing Company. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

Discontinuances: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

TABLE OF CONTENTS ON LAST PAGE OF READING.

THE METRIC MENACE.

Forceful and emphatic are the arguments presented by representative American manufacturers to the Committee on Coinage, Weights, and Measures of the United States House of Representatives against the introduction at this time of metric legislation. There is neither urgent need nor widespread demand, it is contended, for any such radical change; and what agitation there is for measurement with decimal units is fostered rather by academical enthusiasts than practical producers and thoroughgoing trade builders. While the metric system, in itself, is unobjectionable and, indeed, like our American decimal coinage system has much to commend it, its introduction at this time would be inopportune; and such a "reform" might be very hurtful to many American industries.

One prominent manufacturer says that the adoption of such a system would mean the spending of millions of dollars and the injection into American business of more confusion than could be overcome in a generation. Indeed, he says such a change would be little less than a commercial calamity. That the introduction of such a sweeping change in standards would slow up production at a time when greater output than ever is needed is self-evident; and if for no other reason our national lawmakers might well postpone action on the proposed metric legislation.

An automobile concern which exports to all parts of the world a large part of the $60,000,000 worth of vehicles produced by it annually, freely states that it has in no way been adversely affected by the use of the current standards of length, weight, etc. Other large concerns testify that not only do they suffer no disadvantage in making extensive foreign sales, but were they compelled to adopt the metric system they would positively lose hundreds of thousands of dollars a year and might even be forced out of business.

Objection is made, too, to the unnecessary and expensive hearings on the subject on which a vast amount of data is available in America and England; and to coercing manufacturers into adopting a system which they may under existing laws accept voluntarily whenever such course is plainly to their advantage. As over half of the export of America's manufactured goods is bought by English-speaking people, all of whom use the inch standard, plainly it would be more to the advantage of the United States to act in concert with other countries using the same standards of measurement in any scheme for improvement than to "go it alone." Alert foreign rivals might easily reap a huge advantage while America would be making a troublous change.

WHAT MACHINERY HAS DONE FOR RUBBER.

That the business of the twentieth century is founded upon labor-saving machinery as much as upon labor, and even more, is a fact. To catalog the many steam and electric machines and tools that do what the workman once accomplished would be in itself a great task. Not only do they spare and supplement labor, they save time, and materials, decrease working hours, increase the productivity of working hours, cheapen the cost of articles, increase the consumption of commodities and bring comfort to millions.

Charles P. Steinmetz in "America and the New Epoch," says: "One hundred years ago the average workday was ten to eleven hours. Now it is eight to nine hours. It has decreased about 20 per cent. The productivity of work in these 100 years, by the steam engine and the number of inventions and improvements following it, has increased at least tenfold—probably more nearly twenty to thirtyfold—but for illustration let us assume only a tenfold increase. Thus with an average of one hour's work during the day we could now produce as much as we did in ten hours, a hundred years ago."

This is just as true of rubber as of any other industry. The mixing batch of the days of Goodyear on a small belt-driven mill gave a product of forty pounds an hour. The ninety to a hundred pound batches on the modern high-speed mill easily produces four or five hundred

pounds in the same time, or if the mixer handles two mills, twice as much.

Along the line of time saving is the vacuum dryer for washed rubber. Three hours does what air drying took three months to accomplish. (Some of the ultra conservative let Pará rubber hang a year to dry and "age".)

These are but two of hundreds of instances applicable to all lines of rubber manufacture. Nor has this sort of progress reached its limit. Particularly in tire manufacture scores of special machines are created every month. Verily the debt of the rubber trade to the inventor and mechanical engineer is a big one.

LOOKING AHEAD IN CRUDE RUBBER.

One of the most far-sighted of the big rubber manufacturers predicts a shortage in crude rubber by 1924. He bases it upon the present production of rubber plus the increase figured on past experience. Against this he puts the constantly increasing use of rubber, chiefly in automobile and truck tires. This should not give pause in tire manufacture but should lead to provision for more crude rubber. Indeed it probably will result in greater planting areas in the Far East and possibly in the Philippines.

Again comes up the thought of rubber within our own borders. The work that is being done in the guayule propagation is of this sort and deserves and will probably win success. There should be, however, constant work upon other producers, if possible of native origin. The fact that wild *Chrysothamnus nauseosus,* which is so abundant in the mountain regions of Western North America, showed 6.57 per cent of rubber argues at least 10 per cent under selection and cultivation. If only rubber enterprise, backed by rubber money, would take up this very promising lead it would be most gratifying and probably successful.

THE FACTORY TRAINING SCHOOL.

A striking object lesson to industry is the training school for executives and salesmen maintained by the Westinghouse Electric & Manufacturing Co. For years it has been conducting such an educational institution on a constantly broadening scale and with marked benefit to the men and advantage to the company. The students for the courses are selected from among technical graduates of leading schools and colleges, about 450 being enrolled for the 1920 classes. After a year of intensive instruction the students are given positions in various departments. They come from all parts of the world and many return home as foreign representatives of the concern.

Not the least important part of the system is the training of the machinists' apprentices, the course being available for any boy of sixteen who has had a fair schooling. The key-note of the system is "broad training and education and later specialization." The company spares no expense in providing competent instructors, class-rooms equipped with the most perfect material and the highest grade machinery, and in striving to make the courses interesting and thoroughgoing. The boy who completes the four-year term is assured a permanent position and is able to operate any machine in the works, an accomplishment hitherto possessed by scarcely two per cent of the mechanics of the country.

RUBBER PATENT LEATHER WANTED.

American manufacturers of glazed kid or patent leather extensively used for fine shoes are worried over the action of India in levying a 15 per cent tax on all raw skins exported to countries outside the British Empire. They claim that it sounds the death knell of the glazed kid industry in the United States, and the transfer of the manufacture to the Canadian shops. These have the advantage of a 10 per cent rebate of the tax, as the Dominion is part of the British Empire, and can therefore undersell the United States product. As the Indian tax amounts to $3 a pound, and as American manufacturers import from India 42 per cent of the raw skins used, a sure result will be higher prices for shoes and leather goods. Apparently the sole recourse would be to supplant glazed kid as far as possible with some rubber-coated fabric made to resemble the expensive leather article. Rubber will be equal to the occasion if called upon, nor will it be the first time that it has stepped into the breach, and with an adequate substitute either saved a threatened industry or at least averted a certain loss in trade.

No phantom of hope, not even the secret of perpetual motion or the transmutation of base metals into gold, has been pursued more eagerly than the solution of the problem of the non-pneumatic resilient wheel. Among the hundreds of American tire patents issued yearly is always a fair sprinkling of patents for rubber tire substitutes, generally in the form of metal springs to be set around the wheel hub, in the spokes, or in the rim. Ingenious many of them really are, but few give even the smallest promise of standing the rigid tests of practicability. Still the search for the substitute will go on. The failure of one inventor seems but to act as a spur to others in seeking the incalculably rich prize that surely would be bestowed on him who really provides for vehicles a wheel as buoyant as the present air-inflated type, but more enduring and economical. Nevertheless, an intimate study of all the devices thus far produced affords little on which to base the belief that the rubber tube filled with compressed air and its protecting casing will be deposed from the eminent place they occupy in the vehicle world.

Dentists claim that the little rolls of cotton dam are driving rubber dam out of the market. Just one d—— thing after another.

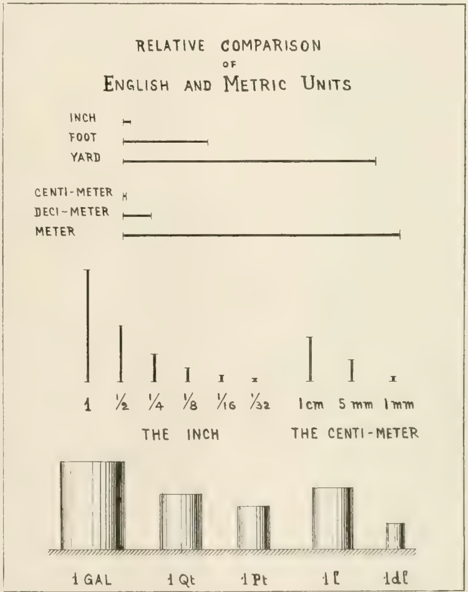
The Metric System Applied to the Rubber Industry.

By C. C. Stutz.[1]

AT THE PRESENT TIME a great deal is being written in the technical and industrial press of the country on the introduction of the metric system into the business affairs of the nation. Newspaper articles are also appearing on the subject, some laudatory of the system and some condemning it. It is being discussed from many angles. Both information and misinformation is quoted and enlarged upon.

This agitation in favor of the metric system has become of late more persistent. Investigation has shown that determined efforts are being made at Washington to induce Congress to pass laws for the "compulsory" use of the metric system of weights and measures. Members of both Houses of Congress have received a deluge of communications urging enactment of compulsory metric legislation and in the absence of opposition the opinion may be formed that such sentiment actually exists. Right here we must remember that the use of the metric system is legal in the United States, and has been so since 1866. Any one, therefore, is at liberty to use it. There is no objection to such voluntary use.

Should "compulsory" legislation be passed it would mean that after a period of say, two or three years, it would be obligatory under penalty to use only the metric system and to discard our present English system. Such a change may appear simple in the abstract, yet touching as it does the every-day affairs of everybody without exception, it contains large potentialities for mischief. For this reason it is wise to look into this problem by giving a brief outline of the metric system itself, and then taking up the conditions that such a change would create, first in a general way and second, how it would affect the rubber industry. After that, the advantages claimed for the metric system will be considered.



SOME RELATIVE COMPARISONS OF ENGLISH AND METRIC UNITS OF LENGTH AND VOLUME.

THE METRIC SYSTEM.

The metric system was, no doubt, at the time the eminent scholars conceived it, an earnest effort to create a scientific system of weights and measures. Unfortunately in those days industrial development was in its infancy and the men charged with the task having no practical considerations to guide them brought out a system based purely on scientific lines.

Since then conditions have changed. Industry has claimed an increasingly important position and has enlisted in its service an ever growing number of individuals. This multitude of artisans, in whose hands any system of measurements is but a tool like any other, has progressed or lagged behind according to the handiness and convenience of the system imposed upon it. To-day the great industrial nations are the United States and Great Britain, both of which have resisted the introduction of the metric system as an implement lacking the qualities so necessary for rapid development. This does not imply that the English system of measurements is perfect. Some of its units and sub-divisions have become obsolete by disuse. This is as it should be. It is a matter of evolution and growth stimulated by experience and changed conditions, and applies to most criticisms of this system.

The accompanying illustration shows some relative comparisons of English and metric units of length and volume. A study of Inch-Foot-Yard and Centimeter-Decimeter-Meter will show at once that the former three dimensions harmonize perfectly for practical use, while in the latter the unit sub-divisions of the meter represent too great a step from the meter itself. In the "inch" and "centimeter" the same defect is apparent to which is added the "indivisibility" of the centimeter as compared with the inch. To the mathematician this is a matter of indifference, but not so to the workman. Divide the inch into 1000th's and the millimeter into 100th's, as required in work of precision, and the metric unit is too small. There is no metric unit comparable with the "foot." This English dimension is used so universally that it would be a hardship to use the meter in its place. Similar observations hold good for measures of volume and weight.

Briefly stated the metric system is devoid of the English system's handiness and convenience; its units are either too large or too small for the every-day requirements of industry.

GENERAL RESULTS FOLLOWING ADOPTION OF METRIC SYSTEM.

Irrespective of the merits of the metric system, its compulsory adoption will in a general way affect the whole country.

[1] C. C. Stutz, a mechanical and electrical engineer with thirty four years' professional experience, the greater part of which was devoted to development work here and abroad, was educated in Switzerland and brought up to the use of the metric system. On coming to the United States he became a naturalized citizen, familiarized himself with the English system of measurement and has used it alternately with the metric during periods aggregating from five to twelve years.

For instance:

(1) A long transition period will be required for changing from one system to the other. As matter of fact old units never disappear. Even in France after 83 years of compulsion the old units are still largely used in the textile industry. The same is true of many South American countries.

(2) A long transition period means the daily use of a dual system. Not only will familiarity with both systems be necessary but it must also be remembered what relation similar units in the two systems bear to each other. As for instance: 1 pound = 0.4536 kilogram and 1 kilogram = 2.2046 pounds.

(3) A great confusion between the two systems is bound to occur, because education is a slow process. This means of course errors, claims, expense and misunderstandings, if not worse.

(4) The discarding of all measuring tools and weighing appliances. This means not only the changing of habits for every individual, man or woman, but it also brings home to them the expense involved. The cost to the transportation companies, the industries and all merchants cannot be calculated.

(5) The recalculation and establishing of new prices for every commodity raised and manufactured to conform to the new standards of length, weight and volume.

(6) All standard goods called for in the new language will be expressed in odd dimensions, as a 7-inch channel will become a 177.8-millimeter channel. To avoid odd dimensions it can be made a 175-millimeter channel, using the multiple of 25 as is done abroad. The result will be the restandardizing of goods, a prospect almost hopeless, when the time and effort required to establish the present standards are considered.

(7) The cost involved in the change becomes appalling and the time required will cripple the industries for years, during which time they will be further handicapped by a flood of importations, thus playing into the hands of foreign competitors.

TABLE OF EQUIVALENTS.

English	to	Metric.	Metric	to	English.
1 inch	=	25.4 millimeters	1 centimeter	=	0.3937 inch
1 square inch	=	6.4516 square centimeters	1 square centimeter	=	.155 square inch
1 foot	=	304.8 millimeters	1 meter	=	3.2808 feet
1 yard	=	914.4 millimeters	1 meter	=	1.0936 yards
1 square yard	=	.8361 square millimeter	1 square meter	=	1.196 square yards
1 gallon	=	3.7853 liters	1 liter	=	.2642 gallon
1 quart	=	.9463 liter	1 liter	=	1.0567 quarts
1 pound	=	.4536 kilogram	1 kilogram	=	2.2046 pounds
1 long ton	=	1.016 metric tons	1 metric ton	=	.9842 long ton
1 short ton	=	.907 metric ton	1 metric ton	=	1.1023 short tons

1 pound per square inch = 0.07031 kilogram per square centimeter
1 kilogram per square centimeter = 14.2228 pounds per square inch

SPECIFIC RESULTS FOLLOWING ADOPTION OF METRIC SYSTEM.

The metric system in relation to the rubber industry will now be considered.

FACTORY EQUIPMENT: Factories for the production of rubber goods use a certain amount of standard equipment such as boilers, steam engines, electric generators and motors, pumps, hoists, valves, shafting, hangers, pulleys, pipes, screws, bolts, nuts, etc. Once the metric system is compulsory, replacements and additions are obtainable only in the new sizes. To fit these to the existing lay-out will be a task for any master mechanic, even should he be a metric enthusiast. Break-downs under such conditions will take on a more serious aspect.

Turning to the factory proper where rubber goods are made, a variety of machines, methods and processes are encountered which will all be affected. These are washers, dryers, mixers and grinders, masticators, cement churns, calenders, spreaders, presses and vulcanizers, tubing machines, etc. All this machinery will have to be made to the metric system; its sizes, capacities and output will carry metric designations, and the goods turned out will be called for in metric dimensions. New machines will be built to fit the new metric dimensions to which the goods may have been changed, but the older machines still hale and hearty may in some cases be obliged to work to reduced capacities, should it not be possible to enlarge them to increased metric dimensions. And should these dimensions be reduced from present ones the same observation fits the case. Only maximum output per machine spells economic production.

COMPOUNDS: While the machines themselves with their upkeep, repair and replacement present a problem, a more serious one is encountered in the question of rubber compounding. The ingredients are mixed according to weight. This means, to begin with, the changing of all scale-beams and runners or weights. The number of compounds used in the rubber industry is legion. Not only do different types of articles require different compounds, but the same article, an automobile tire for instance, is made from several compounds. A typical one follows:

AUTO TIRE TREAD—BLACK.

	Pounds.		Kilograms.
Fine Pará	45	=	20.412
Zinc oxide	25	=	11.34
Carbon black	10	=	4.536
Mineral rubber	6	=	2.7216
Aluminum flake	11	=	4.9896
Sulphur	3	=	1.3608
	100		

The equivalents in kilograms are given for all pound figures in the 100-pound batch. The size of batches varies from about 100 to 300 pounds, according to the capacity of the mixers.

The composition of a compound is the result of extended experience along the path of which many failures have made themselves felt. It is, therefore, not a matter to be trifled with. To translate the figures in use into metric values—and thousands will have to be so recalculated—means the use of decimal fractions of a kilogram. The fact that these are called "grams" does not alleviate the situation, for what superintendent would feel safe in giving his workmen such metric figures to work to? The smaller the batch the greater the danger of inaccuracy.

The trouble of course lies in the fact that the pound and the kilogram bear an unsatisfactory relation to each other. The Bureau of Standards gives this relation as:

1 pound = .4535924277 kilogram; the present writer has used: 1 pound = .4536 kilogram.

SPREADER GOODS: When fabric is to be covered or "spread" with rubber the calender man is instructed to spread a certain weight of rubber per yard of fabric, this depending on the width of the goods. For every pound per yard he will now spread 496 grams per meter of length, because:

1 pound = .4536 kilogram and 1 yard = 1.0936 meters, and 1.0936 x .4536 = .4960569 kilogram, or 496 grams.

VULCANIZING: The vulcanizing of rubber is done with steam at pressures varying from 40 to 75 pounds per square inch, and so the gages read. In the metric system the steam pressures are expressed in kilograms per square centimeter. Inasmuch as:

1 pound per square inch = 0.07031 = kilogram per square centimeter, equivalent readings on the gage now in use and the metric gage compare as follows:

Present (English) Gage. Pounds	Metric Gage. Kilograms
40	2.8124
45	3.1635
50	3.5155
55	3.8670
60	4.2186

As metric gages will be marked to even kilograms and probably to 10ths of kilograms, a latitude is left to the workman in guessing the pressure he has worked to heretofore.

When the metric gage reads kilograms:	The pressure in pounds per square inch would be:
3	42.6685
3.5	49.7799
4	54.8913
4.5	64.0027

Those familiar with vulcanizing will readily agree that absolutely no guessing is permissible in this operation. Therefore special gages would be required, which, while reading to metric figures, are calibrated to actual English pressures. Similar observations hold good for the testing departments and need not be enlarged upon. Of course a new set of gages, scales and measuring tools would have to be installed.

The superintendent will have his troubles in educating his men, but with patience it may be accomplished, provided he himself has first become proficient. His real difficulties will come when he has to use compound figures, such as pressures in kilograms per square centimeter; when fabric specifications are changed, giving new widths to be covered by rubber to the same thickness as on the English width fabrics, etc., etc.

CRUDE RUBBER: While the factory manager and the men in the shop are wrestling with their problems the purchasing agent in his office will be confronted with his own difficulties. Crude rubber is bought by the long ton, 2,240 pounds, and the prices are given in cents per pound. Supposing he needs 50 tons and the price is 47 cents: 1 long ton = 1.016 metric tons, therefore 50 tons = 50.8 metric tons, 1 kilogram = 2.2046 pounds and 2.2046 x 47 = $1.036 per kilogram.

The crude rubber importer, dealer and broker are equally affected; their contracts are changed to metric figures and so are prices, bills of lading, manifests and the whole system of bookkeeping.

COMPOUNDING MATERIALS: This holds good for all compounding ingredients, sundry supplies, solvents and oils. These are received in bulk, some in barrels, kegs and some in steel drums. And all these varied containers will be known according to metric figures, the goods themselves billed and paid for in like manner.

FABRICS: Supposing the purchasing agent in need of fabrics looks up quotations on carriage cloth, duck, sheetings, and tire fabrics. They will appear unfamiliar to him in their metric designations. The following calculations are made to show the work involved in changing these simple looking quotations from the English to their metric equivalents.

(A) Carriage cloth duck:

38-inch 2.00-yard enameling duck..........*yard* $0.46

This quotation interpreted into every-day language means that the cloth is 38 inches wide and that a piece 2 yards long weighs 1 pound, and the price per yard of length is 46 cents.

To convert this into metric figures:

38 inches = 38 × 25.4 = 964.2 millimeters.

To find the length of cloth weighing 1 kilogram:

1 kilogram = 2.2046 pounds and 2 yards of cloth weigh 1 pound,

then 2.2046 × 2 = 4.4092 yards in 1 kilogram.

Since 1 yard = 914.4 millimeters and 1 meter = 1.0936 yards,

4.4092 yards = 4.4092 × 914.4 = 4.032 meters = 4 meters 32 millimeters.

If one yard costs 46 cents, then

1 meter costs 1.0936 × 46 = 50.3 cents.

The quotation now will read:

964-millimeter, 4.032-meter enameling duck.*meter* $0.50.3

(B) Sheetings, 40-inch:

48 × 48, 2.35-yard.........................*yard* $0.36

The quotation tells us that this fabric has 48 warp threads and 48 filler threads per inch. The fabric is 40 inches wide, a piece 2.35 yards long weighs 1 pound, and the price per yard of length is 36 cents.

To write this quotation in metric figures, centimeters will be used instead of inches, meters instead of yards and kilograms instead of pounds.

1 inch = 25.4 millimeters. (1 centimeter = 10 millimeters.)

40 inches = 40 × 25.4 = 1016 millimeters = 1 meter 16 millimeters.

To find the number of threads per centimeter:

25.4 : 10 as 48 : x, and x = 18.9 threads per centimeter.

To find the length of sheeting weighing 1 kilogram:

1 kilogram = 2.2046 pounds and 2.35 yards of sheeting weigh 1 pound,

then 2.2046 × 2.35 = 5.1807 yards in 1 kilogram.

Since 1 yard = 914.4 millimeters and 1 meter = 1.0936 yards,

5.1807 yards = 5.1807 × 914.4 = 4 meters 737 millimeters.

Therefore, a piece of sheeting 4 meters 737 centimeters long weighs 1 kilogram.

If 1 yard costs 36 cents, then:

1 meter cost = 1.0936 × 36 = 39.25 = 39¼ cents.

The quotation now will read:

Sheetings, 1 meter 16 millimeters:

18.9 × 18.9, 4 meters 737 millimeters......*meter* $0.39¼

(C) Tire building fabrics:

17¼ ounce, Sakellarides, combed.......*pound* $2.90

This means that 1 square yard of this fabric weighs 17¼ ounces and that it is sold by the pound.

To convert this into metric figures:

1 square yard = 0.836 square meter and 1 square meter = 1.196 square yards.

1 pound = 16 ounces = 0.4536 kilogram or 453.6 grams, therefore 1 ounce = 28.35 grams.

17¼ ounces = 480 grams = weight of 1 square yard.

Therefore 1 square meter weighs:

1.196 × 489 = 584.84 grams, say 585 grams.

If 1 pound costs $2.90, then

1 kilogram costs = 2.90 × 2.2046 = $6.39⅓.

The quotation now reads:

Tire building fabrics:

585 grams, Sakellarides, combed......*kilogram* $6.39

RECEIVING AND SHIPPING: As the railroads cannot afford to scrap their present freight car equipment to build new cars to even metric dimensions and capacities, and as the cars will have to be marked in that respect in metric figures, both the receiving and the shipping clerk will be confronted with strange figures. A standard railroad car 36 feet 6 inches long, capacity 40,000 pounds will be marked 11 meters 125 millimeters, capacity 18,144 kilograms. Where the freight classification list designates 18,000 pounds as the minimum load for this car, the figure will be 8,163 kilograms. Freight rates will be given per 100 kilograms.

ACCOUNTING AND STATISTICS. In all rubber factories a careful record is kept of the use of the various compounds and the goods made from them. Quotations, records, costs, bonuses, sliding scales, etc., being based on meter, kilogram and liter will all be affected and the accounting force as well as the statistical department will have to reckon with new conditions.

MANUFACTURED RUBBER GOODS.

Standardization is one of the mainstays of American industrial development. It makes possible mass production, cuts down costs and creates uniformity. To say that an article is standard implies desirability. To upset and throw down these standards is to use the axe on the roots of our industrial well-being. And this is precisely what the metric system would do.

In looking over the field of finished goods the list is so extensive that only a few can be mentioned here.

PNEUMATIC TIRES. Tire manufacture has been well standardized. To change to metric figures means not only obliterating present inch markings and the reengraving of molds to metric designations, but also the changing of over-all dimensions. A tire 104 by 914 millimeters would hardly be recognized as a 4½ by 36-inch. The making of new stock lists, price lists and labels follows as a consequence.

BELTING. Rubber belting is standardized as to width on the inch basis and made as to thickness from 2-ply up. The working load of a belt is a certain percentage of its breaking load in pounds per inch width. From this the engineer figures the belt width required for the horse power (English h.p. = 33.000 foot pounds per minute) needed at a given belt speed in feet per minute.

HOSE. Rubber hose is standardized as to its internal diameter in inches, listed per foot of length and rated to pressure in pounds per square inch. An example:

Pneumatic Tool Hose.	English.	Metric.
Internal diameter	½-inch	12.7-millimeters.

Working pressure (double fabric) 175 pounds per square inch, 12.304 kilograms per square centimeter.

List price	$0.47 per foot	$1.54 per meter

MATS, MATTING AND TILING. These are made to standard dimensions and priced per square foot or piece. Corrugated rubber matting, for instance, is carried in stock widths of 24, 30, 36 and 48 inches; the weights are as follows:

English.

Weights per square yard.

3/32-inch thick 5 pounds
⅛-inch thick 7 pounds
5/32-inch thick 10½ pounds

Metric.

Weights per square meter.

2.381 millimeters thick 2.712 kilograms
3.175 millimeters thick 3.975 kilograms
3.969 millimeters thick 5.696 kilograms

DRUGGISTS' SUNDRIES. The list of druggists' sundries and hospital supplies is a long one indeed and includes atomizer bulbs, camera bulbs, syringe bulbs, elastic bands, elastic cords, hard rubber combs, hard rubber funnels, medicine droppers, nipples, nipple shields, rattles, rubber thread, teething rings, tobacco pouches, syringes and water bottles.

Considering the last-named article, water bottles are standard 2 and 3-quart size.

2 quarts = 1.892 liters.
3 quarts = 2.838 liters.

To sell these articles by metric designations would be confusing to both the dealer and the customer. Therefore the retail trade would demand these goods in even figures. The nearest figures would be 1¾ and 2½ liters (7½ per cent small), or 2 and 3 liters (5.8 per cent large). It will be noticed that in the first case binary fractions are here applied to the decimal metric system, an anomaly to the metric faddist. Is it better to standardize the smaller or larger sizes, or should the dealer carry four sizes in stock where formerly he carried only two? In either case the habit of the buying public must be changed and as an additional burden the manufacturer will have to discard his molds and make new ones.

SPECIFICATIONS AND CATALOGS.—The requirements on some rubber goods are very exacting; as a case in point, the rubber insulation for electric wires. Specifications to cover them will have to be rewritten to metric figures and changed in many cases to avoid too extended metric decimal fractions which would not be practical to work to in the factory.

Goods must be advertised. This means new catalogs, after new standards have been settled on, and prices will have to be recalculated to suit them.

Goods must be properly boxed for shipment and attractive presentation to the trade. This means different size boxes to accommodate articles changed to rounded metric figures. This in turn requires new labels, change in billing, etc. Many goods are now packed and sold in dozens and gross. The metric law may compel us to sell them in 10's and 100's.

THE RUBBER INDUSTRY.

To gain a conception of what it would mean to change from a well grounded system of measurements to a system which has, aside from some theoretical considerations, little to recommend it, one must realize the extent of the industry which is asked to take this step. Crude rubber consumption may be taken as a fair indication of the importance of this industry.

	World Consumption. Tons.	United States and Canada. Tons.	United States and Canada. Per Cent.
1917	209,500	155,000	74
1918	210,000	187,000	89
1919	298,000	230,000	77

Furthermore, statistics show that the production of finished rubber goods in the United States was:

1914	$ 300,994,000
1919	1,200,000,000

Still another angle is obtained from the following:

VALUE OF UNITED STATES TIRE EXPORTS.

1913	$ 3,943,220
1914	3,505,267
1915	4,963,270
1916	17,936,227
1917	12,330,201
1918	13,977,671
1919	22,466,580

Viewed from the three angles given it is evident that the rubber industry of the United States is preeminent in the world to-day. These are facts, not fancies; definite statements, not generalizations. This industry is young, vigorous and full of promise for still greater achievements in the future. Shall it be hampered by throwing the "metric monkey wrench" into its machinery?

CLAIMS TO JUSTIFY DEMANDS FOR COMPULSORY USE OF METRIC SYSTEM.

Many claims are presented and urged for the compulsory use of this system. Some are so beside the facts that to consider them would be wasting space and time. The principal arguments are given and answered below.

Simplicity Claimed for Metric System.—The claim is made that the metric system is very simple. Admitting its structural simplicity, it lacks those most important qualities of the English system, handiness and convenience, qualities which no academic perfection can replace.

This is conclusively shown by the fact that, although the metric system has been legal in the United States since 1866, little progress has been made toward its general use in the industries. Had it possessed the qualities mentioned it would have long ago crowded out the English system, which, imperfect as it is, has successfully held its own, and has enabled the United States to become a leader in industrial pursuits.

Supposed Need for World Trade.—The claim is made that this system is needed for world trade, that without it American markets cannot be extended to foreign countries.

In this connection the metric advocates have made much of the fact that when America first began the export of automobiles some cars were equipped with metric tires. Now all this has been changed. A prominent motor car company in a letter says: "Most South American countries take inch sizes with the exception of Chile," while another manufacturer says: "We furnish standard American tires on all our cars."

The American automobile industry standardized the tread of automobiles to 56 inches (4 feet 8 inches, practically railroad gage, which is 4 feet 8½ inches) against the wishes of users in the South, who, on the claim that southern roads were poor, asked for a 60-inch tread. In the Argentine the Americans came in competition with Italy which was furnishing any tread desired. In spite of this the Americans stuck to their standard and now Italy has fallen into line. The standard automobile tread the world over is 56 inches = 1 meter 422 millimeters.

Claimed Won the War for Allies.—The claim is made that the Allies won the war on account of their standardizing to the metric system. All that need be said is that if the metric system has won the war for France, then the metric system has also lost the war for Germany.

Supposed Universal Demand.—The claim is made that between 90 and 99 per cent of the people of the United States want the metric system, therefore its use should be made compulsory.

In refutation of this assertion only a few facts need be recorded here, such as the following. In January, 1920, the Pittsburgh Chamber of Commerce, Robert Garland, chairman, representing a district which, according to statistics, produced in 1918 manufactured articles to the value of $2,305,000,000, passed resolutions condemning legislation in favor of the metric system.

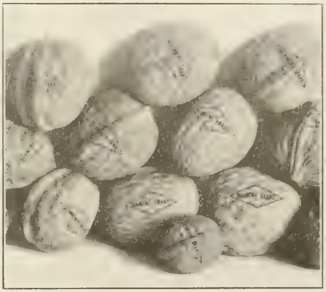
At a meeting held in Chicago, March 16, 1920, the American Railway Engineering Association in convention assembled, passed resolutions against the adoption of this system. Other associations, at various dates and places, did the same.

CONCLUSION.

The space allotted is exhausted and yet the writer has touched only the high spots and these in only a fragmentary way. A great deal more could be said and from many other angles. It is obvious that the writer does not favor the use of this system being made compulsory. If it possesses the advantages claimed for it by its advocates it will prove them, its use being permitted by law. If it cannot win on its own merits by voluntary adoption under the protection of this law, it is not entitled to win under a law of force.

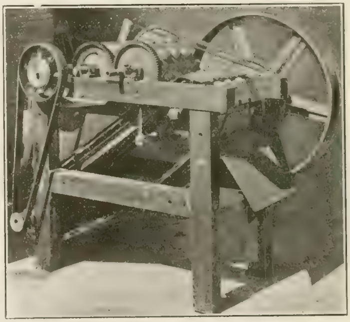
RUBBER BALLS BRAND WALNUTS.

Still another instance of the infinite variety of uses to which rubber can be put is afforded by a newly-invented machine which is being tried by the California Walnut Growers' Association, and which is the device of Ansel L. Wysong of Los Angeles. It was selected from among thousands of other contrivances submitted by contestants for the $10,000 prize offered by the Association, which markets nearly fifty million pounds of walnuts annually and which last year did a business of over $14,000,000.



Walnuts Branded by Means of Rubber Balls.

The essential feature of the machine is a steel cylinder in the surface of which is engraved a series of intaglio branding dies. This cylinder rotates in a bath of quick-drying ink and is engaged with a second cylinder of the same size which carries firmly, in pockets in its surface, soft rubber balls. These balls are so placed that each comes into direct pressure contact with its corresponding engraving on the steel cylinder, receives the impression of the trademark, and transfers it to the shell of the walnut after a further quarter-revolution. An ingenious hopper-conveyor arrangement insures the positive engagement of each walnut with the printing balls, which, being soft and resilient, impress the brand into the tiny cracks and over the sharpest ridges of the shells. Water is run through the steel cylinder to prevent the overheating of the rubber balls through friction.



Walnut Branding Machine.

Besides being used for walnuts, it is likely that the machine may be licensed for branding oranges, lemons and other fruit.

Rubber Creations for Moving Pictures.

That several hundred moving picture companies with large plants and millions invested should use much rubber of the every-day sort is axiomatic. But that the cinema industry should demand an absolutely new line of products comes as a surprise. Yet such is the case, and so great has the demand become that a rubber factory has been built which specializes in this novel line.

HUGE RUBBER SHARKS AND SEA MONSTERS.

When a breathless audience sees a deep-sea diver kill a hungry shark they do not guess that the fish was created in a rubber factory. The shark is actually an air-inflated affair, built of rubber stretched over a light metal frame, with a double underside, suitably painted, having a hinged jaw, and operated by wires a few feet under the water.

When an enormous octopus encloses a man in his terrible tentacles to carry him to certain death, the creature, like the shark, is also made of sheet rubber. From the shore a man with a compressor pumps air through hundreds of feet of rubber hose, inflating the octopus and insuring the slow-encircling movement of the tentacles. Ample sunlight, remarkably clear water, a rocky coast and a deep-sea camera are the other essentials.

Whales and antediluvian monsters are also built up over light frames, the calendered stock being compounded for the dry heat cure. Seams are doubly reinforced and stays are put in wherever there is any likelihood of extra strain. Only a low air pressure is practicable in the larger creations as the air force is so great that a very little extra pressure will burst the huge air bag.

RUBBER SWORDFISH FOR COMEDY WORK.

A world-famous comedian ordered a big swordfish, with its serrated snout set upright instead of sidewise. This was accomplished. Soon the comedian was being pursued through a water-filled tank by the rubber fish, receiving vicious thrusts from its

Captive Surf-Swimming Shark.

sword. Of the same type of creation are the big surf fishes, every fish when inflated being capable of carrying three mermen or mermaids.

RUBBER SPEARS, BATTLE AXES AND BLUDGEONS.

A great battle scene in the Middle Ages required a big supply of war material. The battle axes were made with light sheet metal centers, rubber-covered and with deep rubber edges. The maces for breaking armor had rubber-covered cork ball tops, rubber spikes being vulcanized to the balls. The realistic swords were rubber, painted steel color. The daggers were thin metal blades with two-inch soft rubber points.

Driving an Argument Home.

For an ancient Mexican scene the Aztec Army was armed with huge clubs, each club head representing a skull or dried head of an enemy. This was done in rubber, the sketches for the molds being supplied by research artists in a famous studio. The same sort of creation, although pneumatic, is used in the huge hammers which "drive an argument home."

The spear heads are a line of manufacture in a class by themselves. They are made of a fairly high grade compound that is dense enough to appear rigid and yet as soft as velvet to the touch. They are cured in two-part molds with an iron socket, into which the spear shaft is set. If the spears are likely to see much service the iron is first cleansed from all trace of grease and dipped in copper solution. When the cure is effected the sulphur in the rubber unites chemically with the copper and the rubber is stuck so tightly that it cannot be loosened except by cutting with a cold chisel.

Halberd heads are cut out of sheet stock, following a paste board pattern, and cured between metal plates in a steam press. The cutting edge and the points are skived down after curing and the whole given a final coat of steel colored paint to more closely simulate metal.

RUBBER AND A BURSTING BOILER.

A very exciting scene is provided when movie villains tie their victim to an upright steam boiler, then rouse the furnace to its utmost fury, and leave the poor fellow to be blown to atoms. But it only seems to happen. The boiler is of rubber, its rivets tiny rubber half-balls cemented to its side; the steam gage is an exaggerated air gage and before the boiler explodes a straw dummy has been substituted for the writhing victim. The effect is heightened by the air pressure gradually distending the boiler

sides until the rivets begin to fall off. A blinding cloud of steam, released from a pipe nearby at the critical moment, gives the final touch of realism.

A movie director who had much trouble in getting real bovines to yield milk when, where, and in any quantity wanted, commissioned the company to produce for a wooden cow he was having built a huge udder of rubber. The result was the most docile bossy imaginable, which broke all records as a milker.

Another order was for an air-cushioned bag into which a man could be fastened and then thrown off the roof of a sky-scraper to bounce about in the street below. Up to date this order had not been filled.

A harrow turned upside down is a murderous looking affair, especially when an I. W. W. hurls an honest farmer upon it. With teeth of rubber, however, one falls very comfortably and the movie rubber factory makes such teeth

Every fresh demand for bird, beast, reptile or appliance entails special problems and often original tools and appliances. A considerable degree of general knowledge and engineering skill are required, but above all adaptability and inventive faculty are prime requisites. For example, in building a huge rubber shark weight distribution must be studied so that the completed creature will float, not only right side up but on an even keel. There is also the difficulty of holding air in the hollow carcass once it is submerged, as a very slight extra pressure will force the air out and bring about a collapse.

Take it all in all, the business, although fascinating and specialized in the highest degree, is not one that every one could engage in successfully. It is, however, another triumph for rubber and has made many hazardous and impossible scenes safe and successful.

A SCREEN STAR DRESSED IN RUBBER.

NEW EFFECT IN RUBBERIZED RAIMENT.

A novelty in dress, of interest, is a black cambric, glossy, rubberized cloth, garment in which Miss Bebe Daniels, Famous Players-Lasky motion picture star, recently appeared. The gown is modishly designed and it made a particular hit in the studio, where it photographed with even more luster than satin. The material, which has already been tried to some extent on women's hats, is much thinner, lighter, and more pliant than the finest qualities of painted fabrics, or enamelled cloth, and, as might be inferred, it is impermeable to moisture.

FIRST FEDERAL FOREIGN BANKING ASSOCIATION.

In passing the Edge Bill, Congress has provided machinery, in the form of international banks under Federal charter and under the direct supervision of the Federal Reserve Board, for the financing of this country's export trade. The great depreciation of European currencies in international exchange has erected a barrier against the export trade of the United States. Manufacturers who have built up substantial markets for their products, particularly in Europe, through years of effort, are finding it increasingly more difficult to continue the sale of their goods. European purchasers of our products are unwilling to settle at existing rates of exchange, but in many cases are willing to continue to do business on the basis of credit in the belief that as the work of rehabilitation progresses production will increase, and that within a reasonable time exchange will show a favorable improvement.

Up to the present time, however, the American manufacturer has had no banking facilities enabling him to meet this situation, or permitting him to compete in foreign markets on a credit basis.

The Edge Bill is so drawn as to permit the association of banks and manufacturers in the organization of foreign banking corporations, and in the organization of the First Federal Foreign Banking Association this plan has been followed.

A group of banks selected in New York, Boston, Philadelphia, Buffalo, Bridgeport, Worcester and Springfield, Massachusetts, have underwritten the capital stock for the benefit of manufacturers, in their localities, who are interested in foreign trade. The stockholders of the new bank will, therefore, be manufacturers and banks. The manufacturers, in contributing their business to the bank, will share in the profits of such business. The banks will act as the distributing centers for acceptances, guaranteed paper and other obligations issued by the bank. The new bank, therefore, has the features of a mutual company through which the manufacturers who are stockholders will obtain capital, for financing their foreign business, from the investors of the country, and in furnishing business to the bank will participate in the profits of it. A line of discount on foreign paper bearing some proportion to the capital invested will be granted to manufacturers who are stockholders. In effect, therefore, the proposed plan of organization contemplates that manufacturers interested in foreign trade shall, through their stock ownership, provide a margin in the shape of capital which will furnish an additional security for the obligations to be issued to the public.

The initial capital of the bank will be $2,100,000, evidenced by 20,000 shares of a par value of $100 per share, and 1,000 founders' or managers' participation shares of the same par value. These latter shares are to be entitled to receive 15 per cent of the net earnings, and can be held only by the founders, directors and officers of the company. The purpose of these shares is to enable the organization to secure men of exceptional talent and experience for the work of managing this enterprise, and to obtain the close cooperation of important agencies abroad. The stock of the First Federal Foreign Banking Association, including the founders' or managers' shares, has all been underwritten at $105.

SHIP BY TRUCK—GOOD ROADS WEEK.

National Ship by Truck-Good Roads Week, to be observed May 17 to 22, inclusive, is being planned throughout the country. Tentative plans include motor truck tours covering virtually every section of the country, giving practical demonstrations of the utility of truck transportation and preaching the doctrine of better highways.

Other plans include essays by school children, sermons and the distribution of literature, all designed to arouse interest in a national program of highway construction along lines already advocated by such organizations as the American Automobile Chamber of Commerce, the National Grange, the United States Chamber of Commerce, the National Automobile Chamber of Commerce, the National Association of Motor Truck Sales Managers, and the Ship by Truck Bureau.

Public officials everywhere heartily approve the general idea involved in ship by truck week.

Stabilizing Southwest Cotton Industry.

COTTON-GROWING is assuming such large proportions in the Southwest, and so many are the problems to be solved in connection with the expanding industry, that leading growers and dealers in this essential commodity of automobile tire manufacture have formed the Pacific Cotton Exchange in Los Angeles, California, which will also make the latter city the chief distributing point for the product of the plantations of California and Arizona. The establishment of the exchange is expected to give the raising of Pima or long-staple cotton a great impetus in the states named, and incidentally yield considerable service to the rapidly growing rubber industry in southern California, which was beginning to feel keenly the need of such a "balance wheel" for the new cotton trade.

One of the chief objects of the exchange, as set forth by its president, Thomas W. McDevitt, to a representative of THE INDIA RUBBER WORLD, is to stabilize prices. There is no "future" market for long Pima, as production and grades have been uncertain, and standards of quality must be established, as well as fair prices be insured to producer and consumer. Owing to the great demand that has sprung up, and as large sums will be loaned to handle and market the cotton, the new exchange also purposes seeking state legislation to safeguard the large amounts that will be advanced to aid the industry. As cotton is a cash crop, definite rules must be set up for making loans on commercial paper, warehouse receipts and bills of lading, as well as for insuring against losses of various kinds. Means will also be devised for protecting crops against insect ravages.


THOMAS W. MCDEVITT.

The new exchange has temporary quarters in the I. W. Hellman Building, and its sessions start at 6 a. m. daily to conform to the hour of opening of the New York Cotton Exchange—9 a. m. Eastern time. The other officers chosen, besides Mr. McDevitt, are: M. P. Scott of McFadden Bros., vice-president; K. M. Turner, treasurer; C. H. Hartke, attorney; Board of Directors, Messrs. McDevitt, Scott, Turner, Hartke, and E. M. Fowler of the E. M. Fowler Co.

Mr. McDevitt says that in California and Arizona, 200,000 acres are now producing cotton. They should yield 100,000 bales or, at an average of 500 pounds to the bale, a total of 50,000,000 pounds this year. The Goodyear, Fisk, Firestone, and other tire concerns, which are financing many growers, as well as raising a great amount of cotton themselves, guarantee a price of 60 cents a pound with growers' option on the market beyond that price within a year. At this price the total value of the southwest cotton yield this year will be at least $30,000,000, not counting the seed, which will be worth about $5,000,000 more.

The average cost of putting the cotton in bales is 22 cents a pound and some has been sold recently at $1.24. In 1916 when the Goodyear Tire & Rubber Co. took over 7,000 acres for planting in the Salt River Valley, Arizona, at the instance of Mr. McDevitt, cotton was selling at 52 cents a pound. He ventured the prophecy that in three years it would sell for 75 cents and that the total southwest cotton area would reach 175,000 acres. Both figures have been far eclipsed. The value of Arizona cotton in 1914 was $2,000,000; in 1919 it reached $45,000,000. At the present rate of growth it is expected to total $100,000,000 in 1922.

Land values have shared in the southwest cotton boom, too. Choice acreage that could be had three years ago for $125 now brings $500, and land renting for $10 an acre in 1916 easily rents for $60. This soil is irrigated with water from the Colorado River, which has in a large measure come to be in the Southwest what the Nile is in Egypt, where land sells from $600 to $800 and yet yields a large return on the investment. Plans are now being considered for a wide extension of the fertile area through desert irrigation by means of new canals in California and Arizona from the Colorado river.

The president of the new exchange is very optimistic, not only about cotton-growing, but also about the rubber industry in the Southwest. He says that cotton raised there can meet plantation rubber in Los Angeles and, after being fabricated into tires, can be taken through the Panama Canal to New York and there compete with any similar products of Akron. All of this he promises in the very near future.

TO ORGANIZE INTERNATIONAL CHAMBER OF COMMERCE.

The new International Chamber of Commerce, projected at the International Trade Conference at Atlantic City, New Jersey, last October, will be formally organized at Paris during the week of June 21, 1920. Invitations have been sent out by the American group of the International Organization Committee to business and industrial associations, asking them to name delegates to participate in the organization meeting. About 100 American delegates are expected to attend.

The International Organization Committee is to meet at Paris in advance of the general organization meeting to prepare and report a plan of permanent organization.

In view of the disturbed conditions in international trade brought about by the exchange situation, this meeting is expected to assume additional importance. The vital question of international credit, as well as shipping, tariff regulations, unfair competition in international trade, and other problems of equal moment affecting stability in international trade and production in all the principal countries in the world, will be discussed.

The International Chamber succeeds the old International Congress of Chambers of Commerce, which ceased to function with the outbreak of the World War in 1914.

Membership is to consist of chambers of commerce, commercial organizations, banking and similar associations, firms, corporations and individuals, holding associate but not voting membership. Meetings of the membership will be held every two years, and a system of referenda will be inaugurated during the interval between the bi-annual meetings.

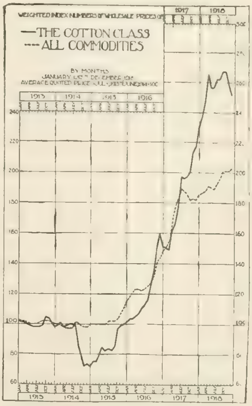
At the first meeting in June only the five countries participating in the International Trade Conference—the United States, Belgium, Great Britain, France and Italy—will be represented. Later, business organizations in the other principal countries of the world will be taken into membership.

Prices of Cotton and Cotton Products.[1]

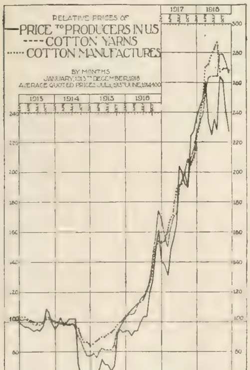
War Industries Board.—Bulletin No. 23 dealing with the prices of cotton and cotton goods, is one of 50 inquiries into wartime prices in different industries. The aim of these studies is to make the price quotations, gathered by various government agencies, available to men interested in problems of business readjustment and also to provide a permanent record of the great revolution in prices during the six years ending in 1918.

To throw as much light as possible upon the course of price fluctuations, this bulletin begins with a brief account of conditions prevailing in the cotton industry. Data regarding production, imports, exports, stocks, government purchases, and government control are woven into the account, and the factors that exercised special influence upon markets are emphasized.

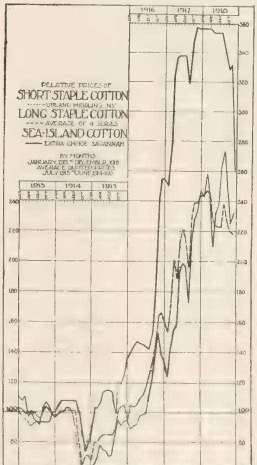
The price charts scattered through the bulletin are drawn on a uniform scale. Since the inquiry centers in the effect of the war, the charts are made to show the movement of prices away from the prewar level. This effect is produced by considering the average of the actual prices during the 12 months preceding the outbreak of war (July 1, 1913, to June 30, 1914) as equal to 100 and reducing the actual prices for each month from January, 1913, to December, 1918, to the form of relative prices with the prewar average as base. For example, if the selling price of a commodity averaged $2 a pound in



Weighted Index Numbers of Wholesale Prices.—Cotton Class and "All Commodities"—By months, January, 1913, to December, 1918. (Average quoted prices, July, 1913, to June, 1914=100.)



Relative Prices.—Cotton to Producers in United States, and Weighted Index Numbers of prices of Cotton Yarns and Cotton Manufactures. By months, January, 1913, to December, 1918. (Average quoted prices, July, 1913, to June, 1914 = 100.)

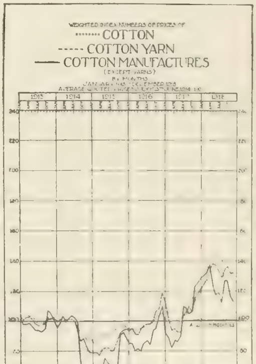


Relative Prices. Short Staple Cotton, Upland Middling, New York, Long Staple Cotton average of four series, and Sea Island Cotton, Extra choice Savannah. By months, January, 1913, to December, 1918. (Average quoted prices, July, 1913, to June, 1914=100.)

the 12 months before the war, and if it fell to $1.80 in October, 1914, the relative price in that month would be 90; if the price rose to $4.60 in July, 1918, the relative price would be 230. On this plan, the price charts are comparable one with another.

For those who wish to know not only the fluctuations of particular prices but also the general trend of prices in different industries, "index numbers" are provided. A simple average of the prices of commodities sold—some by the dozen and some by the ton, some by the yard and some by the bale—would obviously have little value. Therefore, in making index numbers each commodity is "weighted" by multiplying the monthly prices for 1913 to 1918 by the amount of the commodity produced in 1917, plus imports. Nineteen hundred and seventeen was selected as the weighting year because the tables are intended to reflect wartime conditions, and because data for 1918 were unobtainable for many commodities when the bulletins were being written.

An enumeration of the successive steps in making these index numbers will show their meaning. First, for every commodity included in the computation there was made an estimate of the quantity produced in the United States in 1917 plus the quantity imported. Second, the price of the commodity in each month in the six-year period covered was multiplied by the "weight." Third, the products of the different commodity prices times their weights



Changes in Weighted Index Numbers of Prices—Cotton, Cotton Yarns and Cotton Manufactures compared with Index Number of "All Commodities."

[1] Abstracted from War Industries Board Bulletin No. 23, "Prices of Cotton and Cotton Products," by James Harvey Rogers, assisted by Gertrude M. Fairchild and Florence Dickinson.

WHOLESALE PRICES OF COTTON AND COTTON PRODUCTS, BY MONTHS AND YEARS, 1913-1918, INCLUSIVE.

	Cotton.			Price Differences On and Off Middling. Short Staple.		Long Staple.						
	Upland Middling.	Upland Middling.	Upland Middling.	Good Middling.[a]	Low Middling[b]	Strict Middling, 1⅛ Inches.	Strict Middling, 1 3/16 Inches.	Strict Middling, 1¼ Inches.	Strict Middling, 1⅜ Inches.	Sea-Island, Extra Choice.	Egyptian, Sakellarides, Medium.[g]	Average Price to Producers.
Market	Liverpool.	New York.	New Orleans.	New York.[c]	New York.[c]	New Bedford.	New Bedford.	New Bedford.	New Bedford.	Savannah, Ga.	Landed U. S.	U. S.
Unit	Pound. Pence.	Pound.	Pound.	Pound.	Pound.	Pound.	Pound.	Pound.	Pound.	Pound.	Pound.	Pound.
Base price.....	7.2300	$0.1312	$0.1306	$0.0057	$0.0107	$0.1611	$0.1728	$0.1864	$0.2112	$0.2042	$0.2288	$0.1218
1913—Year ...	6.9000	.1279	.1270	.0048	.0085	.1590	.1739	.1873	.2054	.2023	.2306	h.1202
January ...	6.8800	.1306	.1256	.0046	.0080	.1600	.1800	.1975	.2100	.2260	.2300	.1220
February	6.8400	.1280	.1247	.0046	.0080	.1575	.1775	.1950	.2100	.2200	.2300	.1190
March	6.8400	.1259	.1246	.0046	.0080	.1583	.1763	.1858	.1963	.2250	.2300	.1180
April	6.8500	.1229	.1246	.0046	.0080	.1600	.1775	.1875	.1925	.1988	.2300	.1180
May	6.7000	.1200	.1231	.0046	.0080	.1550	.1738	.1875	.1975	.2070	.2300	.1160
June	6.7300	.1219	.1248	.0046	.0080	.1650	.1750	.1875	.1975	.1950	.2300	.1150
July	6.6600	.1235	.1242	.0046	.0080	.1500	.1675	.1875	.2000	.1900	.2233	.1160
August	6.5400	.1211	.1202	.0046	.0080	i.1500	i.1660	i.1875	i.1990	.1900	.2233	.1150
September ...	7.5500	.1346	.1311	.0046	.0080	i.1690	i.1750	i.1875	i.2150	.1900	.2233	.1180
October	7.6800	.1400	.1372	.0046	.0080	.1675	.1788	.1925	i.2200	.1900	.2284	.1330
November ...	7.4500	.1368	.1336	.0054	.0098	.1635	.1740	.1860	i.2175	.1900	.2474	.1300
December ...	7.1400	.1300	.1297	.0065	.0125	.1592	.1700	.1825	i.2100	.2050	.2423	.1220
1914—Year	6.4400	.1121	.1119	.0054	.0125	.1416	.1574	.1738	.1929	.2018	.2190	h.1059
January	7.0800	.1270	.1296	.0065	.0125	.1596	.1700	.1825	i.2075	.2040	.2283	.1170
February	7.0500	.1280	.1291	.0065	.0125	.1588	.1700	.1875	i.2090	.2150	.2243	.1190
March	7.0700	.1326	.1295	.0065	.0125	.1600	.1725	.1875	i.2130	.2200	.2207	.1260
April	7.3200	.1318	.1314	.0065	.0125	.1625	.1763	.1875	i.2125	.2200	.2206	.1190
May	7.4600	.1345	.1335	.0065	.0125	.1625	.1763	.1875	i.2155	.2200	.2270	.1220
June	7.7200	.1346	.1378	.0065	.0125	.1625	.1772	.1875	i.2160	.2200	.2308	.1240
July	7.3800	.1313	.1331	.0065	.0125	.1625	.1775	.1875	i.2130	.2200	.2345	.1240
August	6.3000	.1200	d.1200	.0065	.0125	.1625	.1775	.1875	i.2020	.2200	.2595	.1240
September ...	5.9100	e.0838	.0838	.0037	.0125	i.1200	i.1375	i.1600	i.1650	.2025	.2050	.0870
October	5.1300	e.0692	.0692	.0028	.0125	.0713	i.1130	.1450	i.1520	.1720	.1802	.0780
November ...	4.5600	.0763	.0742	.0028	.0125	.0992	.1200	.1408	.1550	.1500	.2010	.0630
December ...	4.4500	.0759	.0721	.0040	.0125	.1000	.1200	.1450	.1550	.1650	.1960	.0680
1915—Year ...	5.8600	.1015	.0962	f.0051	f.0097	.1324	.1497	.1752	.1891	.2260	.2043	h.0888
January	4.9300	.0828	.0783	.0052	.0090	.1075	.1305	.1528	.1670	.1763	.1637	.0660
February	5.0500	.0854	.0804	.0053	.0090	.1125	.1400	.1613	.1750	.2119	.1700	.0740
March	5.2000	.0899	.0836	.0055	.0099	.1138	.1392	.1610	.1750	.2100	.1820	.0740
April	5.7200	.1029	.0947	.0054	.0100	.1256	.1388	.1625	i.1900	.2165	i.1875	.0810
May	5.3300	.0984	.0906	.0053	.0100	.1275	.1425	.1700	i.1860	.2338	.2031	.0910
June	5.2800	.0967	.0911	.0052	.0098	.1275	.1425	.1700	i.1850	.2350	.2023	.0860
July	5.1800	.0920	.0869	.0052	.0097	.1275	.1425	.1700	i.1810	.2350	.2070	.0860
August	5.4000	.0938	.0895	.0048	.0096	i.1275	i.1435	i.1725	i.1810	.2338	.2050	.0810
September ...	6.2500	.1098	.1053	.0045	.0098	.1292	.1500	.1742	i.1970	.2013	.2200	.0850
October	7.2100	.1250	.1203	.0048	.0099	.1617	.1775	.2000	i.2130	.2445	.2412	.1120
November ...	7.0500	.1189	.1155	.0050	.0099	.1631	.1758	.2038	i.2075	.2450	.2299	.1160
December ...	7.6300	.1236	.1185	.0051	.0093	.1663	.1775	.2050	i.2120	.2565	.2401	.1130
1916—Year	9.0000	.1447	.1412	.0042	.0072	.1919	.2121	.2427	.2563	.3383	.3181	h.1350
January	8.1800	.1240	.1205	.0048	.0083	.1668	.1775	.2050	i.2140	.2800	.2875	.1140
February	7.8500	.1174	.1142	.0048	.0078	.1663	.1775	.2050	i.2090	.2875	.2857	.1150
March	7.8100	.1194	.1177	.0048	.0076	.1625	.1775	.2050	i.2110	.2970	.3110	.1110
April	7.7600	.1206	.1188	.0047	.0076	.1638	.1775	.2110	i.2120	.3000	.3018	.1150
May	8.4200	.1291	.1257	.0048	.0076	.1690	.1866	.2150	i.2250	.2975	.2648	.1150
June	8.3200	.1294	.1280	.0046	.0070	.1750	.1922	.2200	i.2255	.2970	.2772	.1220
July	8.0400	.1304	.1303	.0045	.0066	.1825	i.1952	.2350	i.2350	.2938	.2722	.1250
August	8.8500	.1454	.1417	.0039	.0066	i.1900	i.2142	i.2500	i.2550	.2900	.2772	.1260
September ..	9.5600	.1584	.1532	.0032	.0068	.1975	.2333	.2625	i.2770	.3095	.2972	.1460
October	10.4300	.1812	.1723	.0032	.0070	.2195	.2520	.2805	i.3250	.3844	.3372	.1550
November ...	11.9900	.2006	.1960	.0034	.0066	.2569	.2858	.3081	i.3600	.4844	i.4300	.1800
December ...	10.9600	.1824	.1757	.0034	.0066	.2594	.2908	.3213	i.3270	.5205	.4754	.1960
1917—Year	16.4500	.2350	.2264	.0040	.0067	.3121	.3566	.3841	.4113	.6527	.5806	h.2147
January	10.9600	.1763	.1735	.0037	.0066	.2494	.2738	.3175	i.3200	.5200	.5300	.1710
February	10.9500	.1631	.1708	.0037	.0066	.2413	i.2630	.3025	i.3100	.5100	i.5375	.1680
March	12.2800	.1859	.1764	.0038	.0063	.2613	i.2960	.3125	i.3500	.5570	i.5450	.1590
April	12.7100	.2033	.1950	.0038	.0062	.2833	i.3290	.3470	i.3800	.6625	i.5550	.1800
May	13.2900	.2076	.1995	.0039	.0062	.2906	i.3350	.3600	.3850	.6875	i.5650	.1890
June	17.6000	.2545	.2421	.0039	.0062	.3125	.4100	.3900	.3850	.6900	i.5750	.2020
July	19.0800	.2612	.2525	.0039	.0062	.3250	i.4250	.4130	i.4200	.6900	i.5850	.2470
August	19.2900	.2586	.2513	.0038	.0065	.3250	.3750	.4188	.4500	.6900	i.5950	.2430
September ...	17.7100	.2271	.2160	.0038	.0065	.2925	i.3250	.3833	i.4700	.6513	i.6050	.2340
October	19.9700	.2813	.2659	.0041	.0069	.3495	.4150	.4275	.4925	.6975	i.6150	.2330
November ...	21.8800	.2991	.2804	.0046	.0078	.3844	.4163	.4463	.4863	.7320	i.6250	.2730
December ...	22.2800	.3060	.2894	.0050	.0089	.3888	.4163	.4431	.4875	.7300	i.6350	.2770
1918—Year	22.7300	.3178	.3113	.0091	.0244	.3886	.4061	.4227	.4533	.7077	.6416	h.2948
January	23.1900	.3236	.3105	.0053	.0096	.4044	.4250	.4450	.4900	.7300	i.6350	.2890
February	23.2100	.3185	.3097	.0058	.0102	.4067	.4275	.4467	.4858	.7300	i.6350	.2970
March	23.9600	.3386	.3291	.0065	.0124	.4125	.4350	.4500	.4825	.7300	i.6350	.3020
April	22.9800	.3172	.3260	.0077	.0148	.4106	.4283	.4463	.4775	.7281	i.6350	.3180
May	21.3900	.2749	.2894	.0106	.0193	.3933	.4000	.4067	.4533	.7225	i.6350	.2850
June	21.9700	.3039	.3066	.0133	.0265	.3738	.3940	.4100	.4450	.7225	i.6350	.2740
July	21.6600	.3123	.2945	.0133	.0324	.3750	.3917	.4075	.4350	.7225	i.6350	.2860
August	23.1100	.3446	.3038	.0109	.0329	.3794	.3900	.4088	.4175	.7225	i.6350	.2780
September ...	24.5800	.3578	.3578	.0095	.0324	.3867	.4267	.4392	.4581	.6988	i.6400	.3220
October	23.7000	.3249	.3150	.0083	.0316	.3850	.3875	.4119	.4288	.6700	i.6500	.3180
November ...	21.5400	.2953	.3007	.0086	.0323	.3700	.3838	.4013	.4275	.6750	i.6600	.2930
December ...	21.1800	.3042	.2958	.0085	.0317	.3650	.3853	.4000	.4288	.5313	.6700	.2760

a On middling. *b* Off middling. *c* New York to March, 1915. Average of 11 markets designated by Department of Agriculture, March, 1915, to December, 1918, inclusive. *d* New York price. *e* New Orleans price. *f* Government action taken on December 24, 1914, altered somewhat the standards of grading, but contracts made on the old basis were permissible to February 17, 1915. This probably explains many abrupt changes in prices. *g* Beginning September, 1917, market, f. o. b. Alexandria, Egypt. *h* Not weighted according to quantities marketed each month. *i* Interpolated.

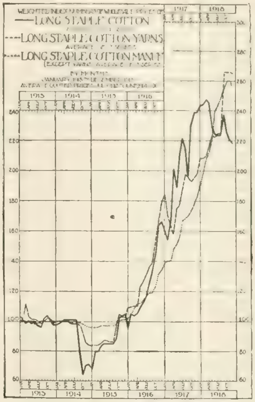
were added up separately for each month. Finally, the monthly aggregates were turned into relatives on the prewar base; that is, the average aggregates of July, 1913, to June, 1914, were made equal to 100, and all the monthly aggregates were made over on that scale.

It is evident that the index numbers made on this plan for an industry are strictly comparable to the relative prices for particular commodities shown in the charts. By the use of these indexes a clear idea can be obtained of average price fluctuations in a given branch of business, and fluctuations in one industry can be compared with those in others.

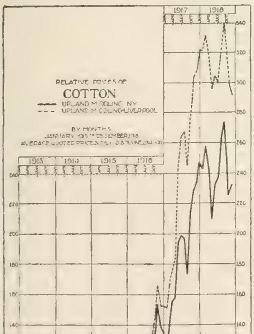
DETAILED STUDY OF PRICE MOVEMENTS.

In any study covering a period of rapidly changing price levels, the significance of price movements of individual commodities or classes of commodities is fully brought out neither by absolute increases nor by increases relative to prices prevailing in some representative year chosen as a base. In fact, both of these methods are inadequate for depicting commodity price movements, unless some direct comparison can be made at all times with the movement of the price level itself. To represent price changes without such a comparison is much like measuring the height of waves on a lake where the level is continually changing, not only without having any regard for the differences in level but using at the same time a continually varying yardstick as a unit of measure. Hence the first comparison is that between the general price level of all commodities and the cotton-class level.

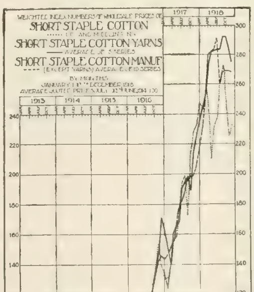
For many purposes it would be advantageous to represent the general price level by 100 at all times and to reduce all other prices to percentages of that base. This method of presentation will be applied later to cotton, cotton yards, and cotton goods, but as such a method of comparison is not in general use, the ordinary mode of representation has been adopted in the accompanying chart.



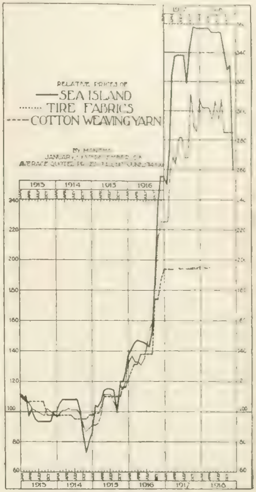
WEIGHTED INDEX NUMBERS OF WHOLESALE PRICES.—Long Staple Cotton, average of 4 series; Long Staple Cotton Yarns, average of 7 series; and Long Staple Cotton Manufactures (except yarns), average of 13 series. —By months, January, 1913, to December, 1918. (Average quoted prices, July, 1913, to June, 1914=100.)



RELATIVE PRICES.—Cotton; Upland Middling, New York, and Upland Middling, Liverpool. —By months, January, 1913, to December, 1918. (Average quoted prices, July, 1913, to June, 1914=100.)



WEIGHTED INDEX NUMBERS OF WHOLESALE PRICES. — Short Staple Cotton, Upland Middling, New York; Short Staple Cotton Yarns, average of 5 series, and Short Staple Cotton Manufactures (except yarns), average of 19 series.—By months, January, 1913, to December, 1918. (Average quoted prices July, 1913, to June, 1914=100.)



RELATIVE PRICES.—Sea Island Cotton, extra choice, Savannah; Sea Island Weaving Yarn, single combed, 80s; and Cotton Tire Fabrics, 17¼ oz., combed.—By months, January, 1913, to December, 1918. (Average quoted prices, July, 1913, to June, 1914=100.)

COMPARISON OF THE PRICE MOVEMENTS OF THE COTTON CLASS AND OF "ALL COMMODITIES."

It may be noted:

(1) That, as was expected, the minor fluctuations of the Cotton Class were more frequent and more pronounced than those of the general price level.

(2) That the low prices of cotton and cotton goods prevailing from July, 1914, to July, 1916, had no counterpart in the general price level, and were consequently a result of forces acting on the Cotton Class as such and not of those affecting the price level in general.

(3) That the rise in prices of the Cotton Class, which started in 1915, began earlier, proceeded faster, had more frequent and more extensive reactions, and finally continued further than that of prices in general.

COMPARISON OF THE PRICE MOVEMENTS OF COTTON, COTTON YARNS, AND COTTON MANUFACTURES.

It is found:

(1) That the fluctuations were most pronounced for cotton and least pronounced for cotton goods.

WHOLESALE PRICES OF COTTON AND COTTON PRODUCTS, BY MONTHS AND YEARS, 1913-1918.

	Cotton yarns.				Cotton manufactures (except yarn).							
	Long staple.					Short staple.			Long staple.	Sea Island.		
	Weaving yarns.					Duck.		Drills.				
	24/1, Eastern Peeler Cones, Carded.	50/2, Eastern Peeler Cones, Combed.	80/2, Eastern Peeler Cones, Combed.	Sea-Island Weaving Yarn, 80/1, Combed.	Sheeting, Brown, 36 in., 60x56, 4 yds.	Standard U. S. Army, Firsts, 28½ in., 8 oz.	Wide numbered Firsts, 60 in., No. 8.	Used by Army, unbleached, 36 in., 66x56, 7 oz. (and substitutes),	Twill, 29.5 in., 104x48, 2.15 yd., 4-leaf.	Aeroplane cloth, standard 36-in.	Balloon cloth, standard B. B., 43-in.	Tire Fabric, 17¼ oz., Combed.
Market	Boston.	Philadelphia, New York and Providence.	Philadelphia, New York and Providence.	Boston.	New York.	Commercial.	Commercial.	.....	Converting Trade.	Boston.	Boston.	New York.
Unit	Pound.	Pound.	Pound.	Pound.	Yard.	Yard.	Yard.	Yard.	Yard.	Yard.	Yard.	Sq. yd.
Base price....	$0.2590	$0.5100	$0.7483	$0.7325	$0.0606	$0.1550	$0.5600	.....	$0.1251	.....	.....	$0.5788
1913—Year	.2598	.5008	.7660	.7708	.0614	.1550	.5950	.....	.1231	.....	.....	.5957
January	.2800	a.4450	c.8000	.8050	.0638	.1550	.6300	.....	c.1225	.....	.....	.6440
February	.2800	a.4450	c.8000	.8050	.0625	.1550	.6300	.....	c.1225	.....	.....	.6340
March	.2525	.5200	.8000	.7850	.0625	.1550	.6300	.....	.1225	.....	.....	.6250
April	.2525	.5200	.8000	.7850	.0613	.1500	.6300	.....	c.1225	.....	.....	.6110
May	.2575	.5100	.7600	.7850	.0600	.1550	.6300	.....	.1200	.....	.....	.5900
June	.2525	.5100	.7600	.7850	.0600	.1550	.6300	.....	c.1200	.....	.....	.5820
July	.2450	.5100	.7600	.7850	.0588	.1550	.5600	.....	.1200	.....	.....	.5780
August	.2450	.5100	.7600	.7850	.0588	.1550	.5600	.....	.1200	.....	.....	.5740
September ..	.2450	.5100	.7600	.7850	.0613	.1550	.5600	.....	.1250	.....	.....	.5660
October	.2725	.5100	.7600	.7150	.0625	.1550	.5600	.....	.1275	.....	.....	.5920
November ...	.2725	.5100	.7600	.7150	.0625	.1550	.5600	.....	c.1275	.....	.....	.5820
December ...	.2625	.5100	.7400	.7150	.0625	.1550	.5600	.....	c.1275	.....	.....	.5710
1914—Year	.2471	.4883	.7267	.7067	.0560	.1463	.5100	.....	.1194	.....	.....	.5622
January	.2625	.5100	.7400	.7150	.0625	.1550	.5600	.....	.1250	.....	.....	.5606
February ...	.2625	.5100	.7400	.7150	.0613	.1550	.5600	.....	c.1250	.....	.....	.5740
March	.2625	.5100	.7400	.7150	.0600	.1550	.5600	.....	.1275	.....	.....	.5870
April	.2625	5100	.7400	.7150	.0588	.1550	.5600	.....	c.1275	.....	.....	.5849
May	.2625	.5100	.7400	.7150	.0588	.1550	.5600	.....	c.1275	.....	.....	.5902
June	.2525	.5100	.7400	.7150	.0588	.1550	.5600	.....	.1212	.....	.....	.5862
July	.2600	.5100	.7400	.6950	.0588	.1550	.5600	.....	c.1212	.....	.....	.5820
August	.2600	.5100	.7400	.6950	.0575	.1400	.4800	.....	c.1212	.....	.....	.5820
September ...	.2450	.5100	.7400	.6950	.0550	.1400	.4800	.....	c.1212	.....	.....	.5606
October	.2250	.4800	.7100	.6950	.0500	.1400	.4800	.....	.1075	.....	.....	.5201
November ...	.2050	.3950	.6750	.6950	.0450	.1250	.3800	.....	.1037	.....	.....	.5040
December ...	.2050	.3950	.6750	.7150	.0450	.1250	.3800	.....	c.1037	.....	.....	.5148
1915—Year	.2183	.4408	.7150	.7875	.0516	.1279	.4642	.....	.1038	.....	.....	.6105
January	.2050	.3950	.6750	.7150	.0438	.1250	.3800	.....	.1000	.....	.....	.5255
February	.2050	.3950	.6750	.7250	.0450	.1250	.3800	.....	.1000	.....	.....	.5280
March	.2050	.3950	.6750	.7250	.0463	.1250	.3800	.....	c.1000	.....	.....	.5330
April	.2150	.3950	.6750	.7550	.0488	.1200	.4000	.....	.1025	.....	.....	.5714
May	.2150	.4050	.6850	.8050	.0475	.1200	.4200	.....	c.1025	.....	.....	.6440
June	.2150	.4050	.6850	.8050	.0475	.1200	.4400	.....	c.1025	.....	.....	.6410
July	.2150	.4050	.6850	.8050	.0525	.1200	.4400	.....	.1025	.....	.....	.6410
August	.2050	.4050	.6850	.8050	.0550	.1300	.4800	.....	.1000	.....	.....	.6110
September ...	.2050	.4850	.7750	.8050	.0600	.1300	.5200	.....	c.1000	.....	.....	.5950
October	.2250	.5350	.8350	.8050	.0575	.1400	.5500	....	.1100	.....	.....	.6790
November ...	.2550	.5350	.7650	.8500	.0575	.1400	.5900	.....	.1125	.....	.....	.6650
December ...	.2550	.5350	.7650	.8500	.0575	.1400	.5900	.....	c.1125	.....	.....	.6920
1916—Year	.3210	.7058	.9925	1.0587	.0722	.1719	.6557	.....	.1354	.....	.....	.9054
January	.2650	.5750	.8050	.8900	.0588	.1450	.5900	.....	.1175	.....	.....	.7650
February	.2850	.5750	.8050	.9200	.0600	.1450	.5900	.....	.1200	.....	.....	.7850
March	.2750	.5750	.8050	.9600	.0600	.1450	5900	.....	c.1200	.....	.....	.7650
April	.2750	.5750	.8050	9600	.0625	.1450	5900	.....	c.1200	.....	.....	.7650
May	.2825	.6100	.9550	1.0100	.0663	.1600	.5900	.....	.1350	.....	.....	.7550
June	.2925	.6400	.9850	1.0100	.0663	.1600	5900	.....	.1350	.....	.....	.7750
July	a.2925	.6750	1 0250	1.0100	.0663	.1800	.6300	.....	.1400	.....	.....	.8300
August	.2950	.7350	1.0250	1.0100	.0725	.1800	.6300	.....	c.1400	.....	.....	.9000
September ...	.3350	.7350	1.0250	1.0100	.0775	.1900	.6700	.....	c.1400	.....	.....	.9250
October	.3800	.8750	1.1750	1.2750	.0850	.2000	.7600	.....	.1525	.....	.....	1.0500
November ...	.4150	.9250	1.2250	1.2750	.0925	.2125	.8233	.....	c.1525	.....	.....	1.2500
December ...	.4600	.9750	1.2750	1.3750	.0988	.2000	.8150	.....	c.1525	.....	.....	1.3000
1917—Year	.4913	.9333	1.2917	1.4250	.1183	.2727	1.0031	$0.1750	.2144	$0.5917	.....	1.5542
January	.4650	1.0250	1.3250	1.4250	0988	.2000	.7650	.....	c.1525	.....	.....	1.3000
February	.4400	.9250	1.2250	1.4250	.0988	.2000	.7650	.....	.1725	.....	.....	1.3000
March	.4200	.8750	1.1750	1.4250	.1025	.2125	.7650	.....	.1725	.....	.....	1.5000
April	.4200	.8250	1.1250	1.4250	.1050	.2500	.8675	.....	.1775	.....	.....	1.5500
May	.4350	.8750	1.2500	c1.4250	.1100	.2500	.9200	.....	.1925	.....	.....	1.5250
June	.4350	.8750	1.2500	c1.4250	1175	.2750	1.0700	.1488	c.1925	.....	.....	1.6250
July	.5300	.9250	1.3250	c1.4250	.1200	.3000	1.2250	.1717	.2450	.....	.....	1.6250
August	.5500	.9750	1.3750	c1.4250	.1225	.3000	1.2250	.1717	.2450	.....	.....	1.5500
September ...	.5500	.9750	1.3750	c1.4250	.1225	.3000	1.2250	.1836	.2450	.....	.....	1.5500
October	.5300	.9750	1.3500	c1.4250	.1350	.3000	1.0700	.1780	c.2450	.5750	.....	1.8000
November ...	.5550	.9750	1.3500	c1.4250	.1400	e.3425	e1.0700	.1857	.2575	.6000	.....	1.6750
December ...	.5650	.9750	1 3750	c1.4250	.1475	.3425	1.0700	.1918	.2750	c.6000	.....	1.6500
1918—Year	.6954	1.1763	1.6563	1.4250	.1948	.3400	1.1508	.2212	.3113	.6250	$0.6053	1.7150
January	6000	1.0100	1.5100	c1.4250	.1650	.3425	1.0700	.1957	c.2750	.6000	.....	1.7750
February	.6150	1.0100	1.5100	c1.4250	.1750	.3425	1.0700	.1970	c.2750	c.6000	.....	1.7500
March	.6150	1 0100	1.5100	c1.4250	.1875	.3425	1.0700	.2036	.3150	c.6000	.....	1.7500
April	.6550	1.1250	1.5100	c1.4250	.2250	.3425	1.0700	.2011	c.3150	.6250	.5787	1.7500
May	.7100	1.1250	1.5250	c1.4250	.2300	.3425	1.0700	.2094	.3250	c.6250	c.5787	1.7000
June	.7100	1.1250	1.5000	c1.4250	.2300	.3425	1 0700	.2210	c.3250	c.6250	.6000	1.7750
July	.7200	1.1250	1 5250	c1.4250	.2300	f.3350	f1.2100	.2380	c.3250	c.6250	c.6000	1.7000
August	.7200	1.1250	1 5250	c1.4250	d.1750	.3350	1.2100	.2446	c.3250	c.6250	c.6000	1.7800
September ...	b.7500	b1.3650	b1.9400	c1.4250	d.1800	.3350	1.2100	.2523	c.3250	c.6250	c.6000	1.6500
October	.7500	1.3650	1.9400	c1.4250	.1800	.3350	1.2100	.2492	c.3250	.6500	.6300	1 6500
November ..	.7500	1.3650	1.9400	c1.4250	.1800	.3425	1.2750	.....	.3025	c.6500	c.6300	1.6500
December ...	.7500	1.3650	1.9400	c1.4250	1800	.3425	1.2750	.....	c.3025	c.6500	c.6300	1.6500

a Carded. *b* Price fixed by the Government after August 14, 1918. *c* Interpolated. *d* Government net price. *e* From November, 1917, sales restricted to Government. *f* From June 21, 1918, prices fixed by the Government.

(2) That price fluctuations occurred most often in the following order: First in cotton, second in yarns, and last in fabrics; but that no general rule as to sequence was followed.

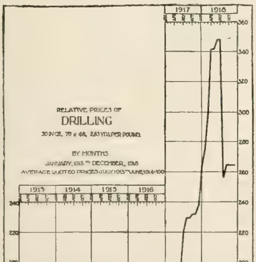
(3) That the great fall in the prices of cotton in the spring of 1918 had no counterpart in the prices of yarns and fabrics. This decline in cotton prices was probably due to the unfavorable military situation which brought with it the threat to shipping and to the prospect of price-fixing. These forces naturally did not have a similar effect on the prices of yarns and fabrics.

(4) That the fall in prices in the early part of the period was greatest for cotton, less for yarns, and least for fabrics, while the rise in prices for the latter part of the period was least for cotton, more for yarns, and greatest for fabrics.

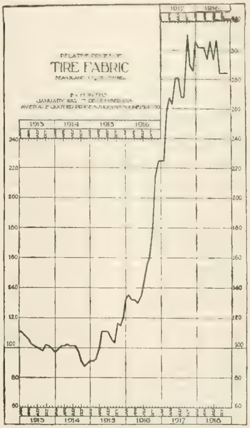
In order to bring out more clearly the relative positions of the raw, intermediate, and finished products and to get a basis for quantitative comparison, the cotton curve, the cotton yarn curve, and the cotton manufactures curve will each be divided (ordinate for ordinate) by the general price curve. The quotients thus derived will represent the rise in prices of each of these classes of products in terms of an all-commodity standard of value.

The fourth chart of page 489 shows:

For cotton.—(1) That the drop in prices in 1914 below the general level was



RELATIVE PRICES.—Drilling, 30 inch, 70 x 48, 2.85 yards per pound.—By months, January, 1913, to December, 1918. (Average quoted prices, July, 1913, to June, 1914=100.)



RELATIVE PRICES.—Tire Fabric, Sea Island, 17¼ ounce, combed.—By months, January, 1913, to December, 1918. (Average quoted prices, July, 1913, to June, 1914=100.)

greater than the rise above that level in 1918.

(2) That the period for which prices were substantially under the general level was somewhat longer than that for which they have been above.

(3) That assuming a uniform distribution of sales by the producers, the net loss resulting from the low prices in the earlier period was greater than the net gain in the later period.

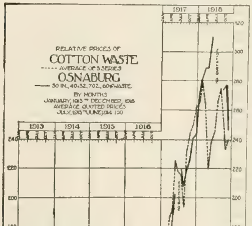
(4) That since the lowest price (below the general level) came in the fall of 1914 and the early spring of 1915, the months when the bulk of the crop was being sold, the balance of loss over gain is larger than appears from a cursory glance at the chart.

For cotton yarns.—(1) That the decrease in prices in 1914 compared with the general level was much less than the rise above that level in 1918.

(2) That the period for which prices were under the general level was substantially equal to that for which they were above.

For cotton manufactures.—(1) That the fall in prices in 1914 below the general level was slight compared to the rise above that level in 1918.

(2) That as was the case for yarns, the period for which prices were under the general level was substantially equal to that for which they were above.

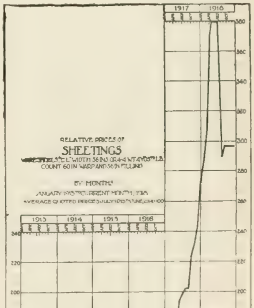


RELATIVE PRICES.—Cotton Waste, average of three series; and Osnaburg, 30 inch, 40 x 32, 7 ounce, 60 per cent waste.—By months, January, 1913, to December, 1918. (Average quoted prices, July, 1913, to June, 1914=100.)

COMPARISON OF THE PRICE MOVEMENTS OF RAW MATERIALS.

SHORT STAPLE, LONG STAPLE, SEA ISLAND. —It should be noted—

(1) That the price movements of short-staple and long-staple cotton were very similar throughout the period, with, however, more pronounced fluctuations in the former. This tendency is probably to be explained by the greater sensitiveness of a



market dominated by transactions on a central exchange.

(2) That the price fluctuations of sea-island cotton were similar to those of the other cottons for the early part of the period, but that prices began to rise faster and farther after the end of 1914, probably as a result of the difficulty of importing Egyptian Sakellarides, almost a perfect substitute, and the great war demand for the longest staple cottons for use in manufacturing automobile tires, balloon cloth, and other fabrics of great strength.

UPLAND MIDDLING COTTON, AT NEW YORK AND LIVERPOOL. It should be noted—

(1) That the fluctuations were entirely similar until the latter part of 1914, when the fall in price at New York exceeded that at Liverpool, probably as a result of adverse exchange rates and anticipated shortage of ocean transportation.

(2) That beginning in the fall of 1915, the differences in prices gradually increased. This increase can probably be largely explained by high freight and insurance rates and difficulties in shipping.

COMPARISON OF THE MOVEMENT OF PRICES OF RAW MATERIALS WITH THOSE OF INTERMEDIATE AND FINISHED PRODUCTS.

SHORT-STAPLE COTTON, YARNS, AND MANUFACTURES. It should be noted—

(1) That the fluctuations were the most pronounced for cotton, and the least pronounced for cotton goods.

(2) That in 1914 the fall in prices was greatest for cotton and least for fabrics; while in 1918, the rise in prices was greatest for yarn and least for cotton.

(3) That no rule can be laid down as to the order in which the fluctuations occurred, but that in general the change in price whether rise or fall occurred first with the raw material and later with the intermediate and finished products.

LONG-STAPLE COTTON, YARNS, AND MANUFACTURE. From chart, page 491, it is seen:

(1) That the fluctuations were the most pronounced for the raw material and least pronounced for the finished product.

(2) That in 1914, the fall in price was greatest for cotton and least for fabrics, while in 1918, the rise in price was greatest for yarn and least for cotton.

(3) That in general fluctuations occurred first in the cotton, next in the yarns, and finally in the fabrics—but that this sequence was not invariable.

SEA ISLAND COTTON, YARNS, AND MANUFACTURES. It is seen:

(1) That unlike the two cases just discussed, the rise was higher for the cotton than for the finished fabric, and for the finished fabric in turn than for the yarn.

(2) That no rule can be established as to the order in which fluctuations occurred.

COTTON WASTE AND OSNABURG. From the chart, page 493, it is seen:

(1) That the price movements for the raw and finished products were very similar.

(2) That the fluctuations in the prices of cotton waste were more pronounced than were those of osnaburg.

(3) That in practically every case the fluctuation occurred first in the price of the raw material.

PRICE TABLES.

The price quotations contained in the accompanying tables have been secured from the Bureau of Labor Statistics, financial papers, trade journals, and private firms. In each case an attempt has been made to select not only the most reliable source but also the most representative market. For example: for short-staple cotton, Liverpool, New York, and New Orleans were chosen as markets; while for Sea Island, Savannah was chosen; and for long-staple varieties, New Bedford. Also each article, for which a series of price quotations has been carried, was selected to represent the price movement in the class to which it belongs.

The prices of cotton are monthly averages of weekly quotations; prices of all other commodities were taken but once a month, and, with few exceptions, represent the market during the first week of the month.

Cotton in British Africa.

THE ELIMINATION of Germany from Africa leaves England free to develop the resources of the continent, particularly in the southern, central and eastern portions, without fear of interference. It leaves her free, for instance, to continue and strengthen the effort to free herself from dependence on the United States for cotton, which started the cultivation of that staple in Nyasaland at the beginning of the century.

An optimistic report on the present condition and on the prospects of cotton cultivation in that country, recalls the marvellous story of the growth of rubber culture in England's African possessions. European cultivation began in 1903 and soon after the high prices of cotton led the Lancashire mill owners to try to do without American cotton and to encourage its growth elsewhere. The British Cotton Growers' Association was formed and took Nyasaland with other districts under its wing. The record of exportation since is:

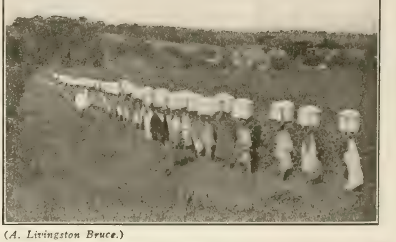
	Pounds	Value.		Pounds.	Value.
1902	962	......	1910	1,736,999	£58,687
1903	56,897	£1,778	1911	1,359,904	44,199
1904	285,185	5,941	1912	3,237,555	80,939
1905	776,640	16,180	1913	2,401,142	65,486
1906	526,119	15,345	1914	2,648,508	72,068
1907	403,486	13,998	1915	3,065,248	68,586
1908	756,120	28,335	1916	3,462,478	127,131
1909	858,926	26,209			

The cotton grown is known as Nyasaland upland and comes from a long-stapled American variety. The seed was originally imported by the Zambesi Industrial Mission; it was acclimated and selected as the kind to grow after long experimentation with Egyptian, Sea Island, Indian, Brazilian, American upland and other varieties. At first they raised Egyptian on land of less than 2,000 feet elevation and Nyasaland up to 3,000 feet; now Egyptian has been wholly discarded and only Nyasaland from carefully selected seed is raised.

The number of acres now under cultivation and the estimated possible area are:

	Under Cultivation. Acres.	Possible Extension. Acres.
Shiré Valley	13,450	218,000
Shiré Highlands	19,000	291,000
Lake Nyasa	400	800,000
	32,850	1,309,000

The natives take easily to cotton raising. There is a fair amount of native labor for the European plantations and many



(*A. Livingston Bruce.*)
A NYASALAND COTTON ESTATE. PICKERS BRINGING IN COTTON.

are beginning to raise cotton independently, but the planters count on modern machinery for the development and above all need improved transportation within the colony.

What the Rubber Chemists Are Doing.

EXTRACTION OF RUBBER GOODS.[1]

IN RUBBER ANALYSIS, where rubber is determined indirectly, as the difference between 100 per cent and the sum of the organic extracts, ash, and total sulphur, it is important that the extracts represent as much as possible of the organic materials which were added to the rubber batch and which are not determined separately. Those who have tried to extract glue from a vulcanized compound containing it, by means of boiling water, know how tenaciously rubber clings to certain admixed materials. In this work it was our intention to ascertain as far as possible how much, if any, soluble organic material is retained in a compound after it has been extracted with acetone for eight hours and chloroform for four hours in the usual way.

The results obtained by successive extractions of cheap rubber mixtures containing mineral rubber and pine tar demonstrated that in the case of cheap compounds, the figure for rubber obtained by the "difference" method cannot be reliable at all, because of the retention of the organic material unextracted. As long as the ashing method is used it is clear that an accurate figure for rubber cannot be expected for this reason. At best it can be but an approximation.

Finding that such mixtures as acetone, carbon bisulphide, and acetone-chloroform, were more effective than the simple solvents in washing residues on Gooch pads, it occurred to us that if a constant boiling mixture of these solvents could be obtained, this mixture might find application in the extraction of rubber goods in the Soxhlet.

Ryland[2] found that a mixture of 55 per cent carbon bisulphide and 45 per cent acetone by volume has a constant boiling point of 39.25 degrees C. Likewise a mixture of 68 per cent chloroform and 32 per cent acetone by volume boils constantly at 64.7 degrees C. Accordingly, it was decided to extract samples of cheap rubber with acetone for eight hours, and then with such a constant boiling mixture, and compare the weight of extract so obtained with that obtained by means of pure carbon bisulphide, or pure chloroform.

From the results obtained, it is plain that chloroform is slightly better than carbon bisulphide as a solvent for extracting rubber, while the constant boiling mixture, whether it be 55 per cent carbon bisulphide, 45 per cent acetone or 68 per cent chloroform, 32 per cent acetone, is a much more efficient solvent than either carbon bisulphide or chloroform.

Further, one extraction with a constant boiling mixture may take the place of the two extractions, namely, acetone for eight hours, followed by chloroform for four hours, according to common practice in the rubber laboratory to-day. To ascertain whether such a substitution would be possible, the following mixture was made by distilling a mixture of 55 per cent by volume of carbon bisulphide and 45 per cent by volume of acetone over copper at a temperature of 39.25 degrees C. The solvent therefore contained no sulphides or free sulphur so that sulphur determined in the extracts could not be attributed to the solvent. Likewise, the mixture of 68 per cent by volume of chloroform and 32 per cent by volume of acetone was freshly distilled, and contained no sulphur.

A study of the results with these mixed solvents reveals that:

(a) A small amount of sulphur, usually less than 0.1 per cent is extracted by the chloroform.

(b) About the same amount of sulphur is extracted by the mixture of 55 per cent carbon bisulphide and 45 per cent acetone when it is used in place of chloroform.

[1]Abstract of paper by S. W. Epstein, assistant chemist, and B. L. Gonyo, laboratory assistant, Bureau of Standards, Washington, D. C., read before the Rubber Division of the American Chemical Society, at Philadelphia, Pennsylvania, September 2-6, 1919.

[2]Ryland, "Journal of the American Chemical Society," 1899, volume 22, page 384. See also Young, "Fractional Distillation," pages 68 and 69.

(c) Either mixture extracts from the original sample, in eight hours, as much or more material than the sum of the extracts obtained by the eight-hour acetone extraction and the four-hour chloroform extraction.

(d) Either mixture extracts from the original sample, in eight hours, as much or more material than the sum of the extracts obtained by an eight-hour extraction with acetone and a four-hour extraction with a mixture of 55 per cent carbon bisulphide and 45 per cent acetone.

(e) The free sulphur present in the extracts obtained by the use of the mixtures is usually from 0.1 per cent to 0.3 per cent higher than the amount present in the acetone extract.

(f) There seems to be no advantage in extracting 12 hours or longer with the mixed solvents, since the figures are at the maximum in eight hours.

(g) The mixture of carbon bisulphide and acetone does not decompose during the extraction to liberate sulphur or sulphur compounds and in this way affect the free sulphur determination.

(h) The mixture of 68 per cent chloroform and 32 per cent acetone produces heavier extracts than that of 55 per cent carbon bisulphide and 45 per cent acetone.

Determination of the effect of the mixed solvents was made on high-grade stocks for the purpose of ascertaining what varying solvent effect they would have on vulcanized rubber.

Four compounds containing (A) 70 per cent, (B) 85 per cent, (C) 95 per cent and (D) 45 per cent of rubber, respectively, were extracted eight hours with acetone and four hours with chloroform and then one was subjected to four hours' additional extraction with chloroform, another to four hours with 55 per cent carbon bisulphide, 45 per cent acetone, and a third to four hours with 68 per cent chloroform and 32 per cent acetone.

All three solvents dissolve vulcanized rubber to an extent which seems to depend upon how heavily it is compounded. It is interesting to note that the mixture of 68 per cent chloroform—32 per cent acetone exhibits this ability to dissolve rubber to a marked extent. The rubber dissolved by it in the above is nearly twice that dissolved by pure chloroform. On the other hand, the mixture of 55 per cent carbon bisulphide—45 per cent acetone hardly exhibits this ability at all, so that the rubber dissolved by it is inappreciable as compared with that dissolved by chloroform or the mixture of chloroform and acetone. Obviously, this is a point in favor of the use of the mixture of 55 per cent carbon bisulphide—45 per cent acetone.

These results obtained by the carbon bisulphide-acetone mixture on these high-grade compounds are in every case lower than the sum of the acetone and chloroform extracts. The figures for free sulphur are also in accordance with previous statements given here. It is evident, therefore, that it is highly advantageous to use the mixture of carbon bisulphide and acetone to take the place of acetone and chloroform, because of this less active solution effect upon rubber as shown.

Before recommending the adoption of this mixed solvent, a few words must be said about deterioration of the solvent, and blank extracts that will form in it. It was found that the freshly distilled mixture would give no blank, and at the end of two weeks would still give no blank. However, at the end of a month's storage 75 cc. of the mixture would give a residue which, although it contained no sulphur, yet weighed up to 0.006-gram. Therefore, it is advised that where the mixture is being used in large quantities for routine analysis, it be redistilled over copper every week. Where it is used only occasionally, it should be mixed up fresh and distilled before using.

SUMMARY.

1. Extraction for eight hours with acetone followed by four hours' extraction with chloroform does not remove all soluble material from some rubber compounds.

2. After a rubber sample has been extracted with acetone it was found that:

(a) Chloroform in every case extracted slightly more material than carbon bisulphide.

(b) Constant boiling mixtures such as 55 per cent carbon bisulphide—45 per cent acetone and 68 per cent chloroform—32 per cent acetone extracted from many cheap compounds considerably more material than either chloroform or carbon bisulphide.

3. The constant boiling mixture of 68 per cent chloroform and 32 per cent acetone exhibits a marked ability to dissolve vulcanized rubber, as contrasted to the mixture of 55 per cent carbon bisulphide 45 per cent acetone which hardly exhibits this ability at all.

4. It is recommended that the constant boiling mixture 55 per cent carbon bisulphide and 45 per cent acetone be used in place of acetone and chloroform to extract rubber samples since:

(A) It eliminates one extraction with the necessary weighings.

(B) Extraction is complete in eight hours, while the acetone and chloroform extractions require a total of twelve hours.

(C) The extraction of free sulphur is complete.

(D) A rubber analysis in which the mixed solvent is used is more accurate than that in which acetone and chloroform are used separately because:

I. Little or no rubber is dissolved by this mixture, as compared with chloroform which will in some cases dissolve considerable quantities.

II. The extraction of cheap rubber compounds is more nearly complete, since the extracts obtained are greater than the sum of the acetone and chloroform extracts.

SYNTHETIC RUBBER OF GERMAN MANUFACTURE.

A number of different types of synthetic rubber have been prepared, all of them by the gradual polymerization of butadiene, mono-methyl butadiene (isoprene), or di-methyl butadiene (methyl isoprene). Each of these three original substances yields a different type of synthetic rubber of different composition and properties. Only that obtained from mono-methyl butadiene or isoprene is supposed to give a product of the identical composition of natural rubber, but even this is very doubtful. All the products have properties in some way resembling rubber, but that obtained from di-methyl butadiene, yielding the so-called methyl rubber, was found by the Germans to be the most useful as a substitute for natural rubber, particularly for the manufacture of vulcanite plates for accumulator cells, believed to have been used in large numbers for U-boat equipment.

In many ways these synthetic rubbers behave like a partly vulcanized rubber. Probably oxidation sets in during preparation, and this would be sufficient to account for the semi-vulcanized condition. Thus raw rubber, when mixed with powerful oxidizing agents such as "benzoyl peroxide" and heated, yields a product resembling vulcanized rubber. For this reason the specimens do not dissolve in benzene, cannot be rendered properly plastic on the hot rolls without the addition of aids to plasticity, and vulcanize badly. It is also known that synthetic rubber tends to oxidize in the air, and that to obtain satisfactory vulcanized products, it is necessary to use relatively large quantities of powerful accelerators.

There appears to be no doubt that Germany used large quantities of synthetic rubber, particularly this methyl rubber, during the war, but the product cannot compete with natural rubber either in quality or price under normal conditions. ("The Bulletin of the Rubber Growers' Association," London, Volume 1, No. 3, November, 1919.)

CUMAR RESIN.

Cumar, a synthetic resin produced from coal-tar distillates, is gaining recognition in the rubber industry as a valuable compounding ingredient. Chemically it is a mixture of para-coumarone, para-indene and the polymers of other hydrocarbons found in coal-tar. In appearance cumar resembles ordinary resin, but its properties are radically different. It is uniform in quality, neutral, non-saponifying and non-oxidizing. It is not affected by water, acids, alkalies or salts. Exposure to the air or weather will not change it.

Cumar is soluble in all coal-tar solvents, turpentine, vegetable oils, carbon bisulphide, carbon tetrachloride, ether, acetone and most commercial solvents. It is insoluble in alcohol. Its specific gravity is 1.05-1.15. Nine different grades are available, classified according to melting point, ranging from 50-60 to 145-160 degrees C., and in color from clear light yellow to dark amber, gaged by definite color standards.

The softer grades, melting at 50-60 and 60-70 degrees C., are good solvents for rubber and are useful for softening the gum in the breaking-down operation. The hard grades, melting at 90-100 degrees C., is used extensively as a substitute for Pontianak and similar resins in rubber compounding. Cumar mills readily into the rubber on the rolls and adds tackiness and plasticity to the unvulcanized stock. It is of value also in the manufacture of rubber cements and reclaimed rubber.

VARIABILITY OF CURE OF SLAB RUBBER.

Researches of Dr. H. P. Stevens on the variability of cure of slab rubber show results which negative the conclusions of the agricultural chemist of the Federated Malay States as to the "remarkable uniformity" of slab rubber.

Slab rubber has a repulsive appearance, especially on arrival at destination. The surface is dark and slimy from the exudation of serum. It is usually moldy, and the smell is very offensive. The slab can be washed and crêped on the plantation with a relatively small loss in the rate of cure. The rubber in this form is much more presentable, but the color is dull and the rubber frequently streaked. Experiments on a manufacturing scale have resulted in the production of crêpe from matured coagulum of a uniform pale shade. The color was less bright than that of ordinary crêpe but sufficiently good to pass as standard crêpe. Of three sample cases of crêpe tested, the first cured 34 per cent faster than that prepared ordinarily, two other cases cured 67 and 57 per cent faster, respectively. Hence, although all sample cases contained more rapidly curing rubber and were prepared in the same manner, the rate of cure showed appreciable variation.

SYNTHETIC ACETIC ACID AS A LATEX COAGULANT.

Synthetic acetic acid produced from calcium carbide is not of the purity of that obtained from pyroligneous acid, as the synthetic acid is brown in color and has a distinct odor. It is, however, free from copper and suitable for latex coagulation, as the amounts of brown coloring matter in the acid are not sufficient to affect the color of the finished rubber.

Experimental data show that synthetic acid coagulated specimens of both crêpe and smoked sheet are practically identical with the corresponding samples coagulated with ordinary acetic acid. ("The Bulletin of the Rubber Growers' Association," London, Volume 2, No. 1, January, 1920.)

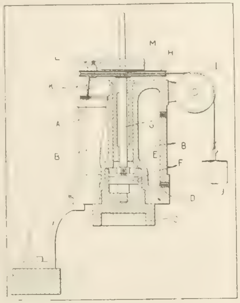
LEAD OLEATE.

A preparation of lead oleate is now on the market for use as a mild accelerator of vulcanization. It is marketed as an oleaginous mass of wax-like consistency, fracture, and melting point. It is non-poisonous, and gives off no fumes. It has no tendency to cause scorching in mixing or calendering. It may be used in conjunction with aniline or hexamethylene tetramine but should not be used with thiocarbanilide.

LABORATORY APPARATUS.

APPARATUS FOR DETERMINING VISCOSITY OF RUBBER.

A NEW MECHANISM for the determination of the viscosity of rubber under varying conditions of temperature and pressure is here illustrated.



RUBBER VISCOSITY TESTER.

The apparatus comprises a cylinder A bracketed to a table and cored out at B for the circulation of steam. A hole runs axially through the cylinder in which at its enlarged lower end a nut C is screwed holding the fixed lower gripping disk D. Gripping disks D and E are provided with radial teeth for engaging the test sample F. The upper disk E is attached to the vertical spindle G, which is made to turn by a cord passing around the grooved horizontal pulley H, thence over the pulley I and suspending weight J. The angle of rotation is indicated by a pointer K attached to the horizontal pulley H. The location of the pointer is adjustable by the thumb nut L. The pressure upon the sample F under test is regulated by weights M placed over the extension of the spindle.

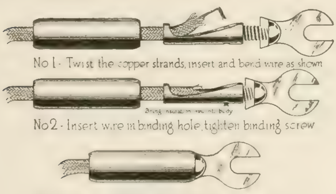
Stocks of a certain grade should show a definite travel for known conditions of pressure, torsion, temperature and time; these being known for standard stocks, a comparison of samples is easy. It is the viscosity of the rubber which permits the larger part of the movement indicated on the scale.

The coefficient of viscosity may be determined directly by this apparatus. A calibration chart can be prepared, showing the coefficient of viscosity corresponding to different amounts of travel of the pointer in a unit of time for different conditions of pressure, torsion and temperature, and, those conditions being known and the travel of the pointer determined, the coefficient of viscosity for the sample in hand may be read directly from the chart. (Ralph B. Naylor, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls—both in Massachusetts. United States patent No. 1,327,838.)

SOLDERLESS TERMINALS.

Electrical connections that are intended to be permanent or perfect or both, are made by the use of solder. Such a connection, however, is subject to impairment when under strain.

DIRECTIONS FOR INSTALLING MELIORATE TERMINALS



No 1 - Twist the copper strands, insert and bend wire as shown

No 2 - Insert wire in binding hole, tighten binding screw

No 3 - Force

The solderless terminal overcomes all the inconveniences inherent in the soldered connector, and is unique in design and execution. It is known as the "Meliorate Terminal," and its construction and method of use are clearly shown in the illustration. Polarity is indicated by a black or red sleeve of a hard, strongly dielectric material that can withstand the hardest usage. (Standard Scientific Co., 70 Fifth avenue, New York.)

CHEMICAL PATENTS.

THE UNITED STATES.

LEATHEROID AND PROCESS OF MANUFACTURE, comprising an admixture of leather, rubber, casein and an alkali earth metal oxide. (Bernhard Fritzsch, Cincinnati, Ohio. United States patent No. 1,334,297.)

METHOD OF RECLAIMING RUBBER, consisting in dividing the rubber into pieces, placing it loosely in a chamber, expelling the air from the chamber by the injection of steam under pressure, and heating the rubber while in a loose condition in the chamber by an externally applied source of heat. (Douglas Frank Twiss, assignor to The Dunlop Rubber Co., Limited—both of Birmingham, England. United States patent No. 1,335,926.)

RUBBER PRODUCT AND COMPOSITION. As new compositions of matter, solutions containing in a common solvent, more than 50 per cent of rubber and from about ten to 30 per cent of a semi-solid to solid bitumen obtainable by the destructive distillation of coal tar pitch. (John M. Weiss, assignor to the Barrett Co.—both of New York City. United States patent No. 1,334,060.)

THE UNITED KINGDOM.

VULCANIZABLE CONDENSATION PRODUCTS.—Obtained by passing a vaporized mixture containing dienes such as isoprene, for example, the mixture of gases and vapors obtained by cracking mineral oil under high pressure, over a heated contact mass (bauxite, fuller's earth, clay, animal or vegetable charcoal, etc.) at a temperature above the melting-point of the resin formed, say from 110 to 250 degrees C.; the molten resin is drawn off from the bottom of the contact vessel and solidified. The product is soluble in alcohol or ether, and may be used in the manufacture of varnishes, coating compositions, plastic compositions, insulating materials, etc., and may be vulcanized. (Hall Motor Fuel, Limited, Pinners Hall, Austin Friars, London, England. [H. V. Dunham, Brattleboro, Vermont, U. S. A.] British patent No. 138,046.)

THE FRENCH REPUBLIC.

RUBBER COMPOUND.—An improved process for the manufacture of rubber compounds. (N. D. Nielsen. French patent No. 500,174.)

AUSTRALIA.

RUBBER SUBSTITUTE.—The process and product which consists in combining fish oil and sulphur in the presence of heat and resubjecting the resultant combination to heat under pressure. (Morton Gregory, assignor to Western Rubber Co., both of Tacoma, Washington. Australian patent No. 5,882.)

PRESERVATION OF RUBBER.—A process for preserving india rubber. (F. E. Stowe, New South Wales. Australian patent No. 3,364.)

GERMANY.

SPONGE RUBBER.—Coagulating rubber latex under conditions producing a porous or spongy coagulum and fixing the pores by vulcanization. (Philip Schidrowitz and H. A. Goldsborough, London, England. German patent No. 321,092.)

AMERICAN-MADE FILTER PAPER

Acid-washed filter paper for quantitative chemical analysis, which paper was formerly imported, is now being made by a small paper-making plant in New England, which is said to have capacity for this purpose more than sufficient to meet the entire American demand.

AMERICAN CHEMICAL SOCIETY.

RUBBER DIVISION MEETING.

THE SECOND MEETING of American rubber chemists, organized as the Rubber Division of the American Chemical Society, took place at the fifty-ninth meeting of the society at St. Louis, Missouri, April 14-15, 1920.

Brief abstracts of the papers presented at the Rubber Division meeting are given below:

BROMINE ADDITION TO RUBBER.

When rubber is treated with bromine, both addition and substitution occur but by determining these separately the unsaturation is found to be one double bond for each isoprene unit. —W. K. Lewis and William H. McAdams.

RECOVERY OF VOLATILE SOLVENTS.

Solvents can be recovered by absorption, compression or refrigeration. Each method has its own distinctive field. These fields are brought out and the chief features of each method are also emphasized.—W. K. Lewis.

THE DETERMINATION OF TRUE FREE AND TRUE COMBINED SULPHUR.

Sulphur is considered present as free and combined. Acetone soluble sulphur may be partly combined with resins, etc., as may the sulphur insoluble in acetone, heretofore considered as combined with rubber. The total acetone extract is soluble in alcohol, but if alcohol saturated with sulphur is used, none of the truly free sulphur will dissolve and hence can be separated from the remainder of the extract. Results show about 0.4 per cent sulphur combined with resins.

About 85 per cent of *Hevea* resins are saponifiable and hence any resinous sulphur compounds insoluble in acetone may be soluble in alcoholic potash. Acetone extracted sample is boiled 8 hours with alcoholic potash and about 0.25-0.30 per cent sulphur extracted.

So far only pure gum stocks have been investigated.—W. J. Kelly.

SMALL AMOUNTS OF MAGNESIA AND CERTAIN ORGANIC SUBSTANCES AS ACCELERATORS.

The activity of small amounts of extra light magnesia was compared with the effect of similar amounts of certain organic substances. The load required to effect a given extension was found to be fair measure of the rate of cure of the mixture which contained magnesia. This was not found to be true for the mixtures containing the organic accelerators. The accelerating activity of magnesia in small amount was found to be of secondary character, acting in conjunction with certain extraneous substances, probably nitrogeneous, present in the rubber. The amount of these extraneous substances was found to limit the activity of magnesia as an accelerator.—G. D. Kratz and A. H. Flower.

OBSCURING POWER OF PIGMENTS.

The fineness of pigments can be determined by measurements of turbidity and be expressed in absolute units.—W. K. Lewis.

EFFECT OF COMPOUNDING INGREDIENTS.

Compounding experiments in which up to 50 volumes of filler were added to 100 volumes of rubber are described. The values of tensile strength are also corrected for actual volume of rubber present. Tensile strength calculated on area at rest is unfair to pure gum stocks. Tensile at break is suggested as a better means of comparison. This is calculated on the actual cross section at break rather than on the original cross section. A correction factor, due to volume increase during stretching, is also involved. A visual picture of the structure of rubber is given. This is based on the hypothesis that large colloidal aggregates function as elastic fibers and the smaller as plastic material. Vulcanization is said to lock up these fibers to form a network.—C. O. North.

PHYSICAL TESTING OF RUBBER GOODS.

The report of the Committee on the Physical Testing of Rubber Goods was accepted as it stands with the understanding that this committee will attempt to correlate its work with the various other technical societies in the country in order to get unit specifications agreeable to all.

A METHOD FOR THE DETERMINATION OF PERMANENT SET ON VULCANIZED RUBBER GOODS.

Before vulcanization, rubber compounds are plastic. During the cure they are changed to a more or less elastic state. However, there is always a certain residuum of plasticity in the cured compounds. In addition to this there is undoubtedly an arrangement of the elastic material which may be likened to a network of fibers which do not all lie in a line with the direction of the stretching. Under tension these fibers are straightened out and do not again return to their original positions. There is evidence that these fibers may be of irregular shapes, having bends or knuckle-like projections such that in one stretch these projections will cause the fibers to catch, but upon release of tension this hold will be loosened so that on another stretch measurably more elongation will be produced by the same tension. If these elastic fibers are stretched beyond their elastic limit, some of the bonds will be broken causing an apparent set which should not be counted against the stock. The set test then should be such that it will bring out the inelasticity caused in the stock, (1) by plastic flow, (2) complete straightening of the fibers, including those tangled.

Three methods have been considered for accomplishing this, the possibilities of which may be summed up as follows:

(A) Decrease in tension under given constant elongation. This method shows no advantage and results do not indicate any direct association with the thing we wish to measure; it is a case of measuring length by units of weight. The test involves expenditures of time and money, which render it impractical.

(B) Increase in elongation against time under constant load. Reliable results can only be obtained by repeated applications of the load, each of which should remain on the piece for a matter of hours. In spite of its merits, this test was therefore abandoned because it was considered impractical.

(C) Stretching for a given period of time to a given elongation, releasing, resting, and repeating until there is no further set.

The most practical method for measuring set reliably by this method was worked out as follows:

Compounds were selected representative of pure gum, cheap friction, high and low gravity tread, cheap tread, and cheap mechanical goods stocks. Four each of these pieces were stretched to ten per cent of the breaking elongation four times, held for ten minutes each time, rested ten minutes between stretches and finally ten minutes after the final release the set was measured. The results appear in Table I.

TABLE I. PERCENTAGES OF SET.

	Per Cent Elongation.							
	10.	20.	30.	40.	50.	60.	70.	80.
Pure gum	0.0	0.0	2.0	8.0	6.0	6.0	8.0	16.0
Cheap friction	0.0	1.0	3.0	6.4	8.5	16.5	27.5	....
Friction	0.0	0.0	4.0	0.0	1.0	8.0	20.0	24.0
Low gravity tread	0.0	1.0	7.0	10.0	17.0	25.5	41.0	51.0
High gravity tread	0.0	1.0	7.0	12.6	19.0	29.5	59.0	53.5
Cheap tread	0.3	2.0	6.0	12.5	27.5	33.5	40.0	34.5
Mechanical	1.0	3.0	5.0	14.5	23.5	52.0	42.0	55.0

In every case a point was reached beyond which the set went up abruptly. This point, we believe, represents the limit of the range. It seemed impractical to make a separate limit for each compound or class of compounds. In the majority of cases the break in the curve occurred between 60 per cent and 70

per cent. Accordingly 60 per cent of the breaking elongation was fixed as the most desirable point to which to stretch.

EFFECT OF SUCCESSIVE STRETCHING.

Ten pieces of stock were broken and the average elongation taken. Ten pieces of each stock were then stretched to 60 per cent of this elongation held ten minutes, released and measured after ten minutes. This was repeated to four stretches. The results shown in Table II are each the average of ten tests:

TABLE II. EFFECT OF REPEATED STRETCHING ON SET.

	Permanent Set after Each Stretch.					
Stretch	1st	2nd.	3rd.	4th.	Total Set.	Set by First Stretch Figured to Percentage of Total Set.
		Additional Set.				
Pure gum	4	2	0	0	6	66
Cheap friction	13	2	1	0	16	81
Friction	4	2	[illegible]	0	8	50
Low gravity tread	18	1	5	1	25	72
High gravity tread	14	6	4	1	25	56
Medium gravity tread	19	12	8	1	40	47.5
Cheap mechanical	22	9	8	1	40	50

Attempts have been made to reduce the time required for stretching and resting between stretches, but the results do not seem quite reliable, although for routine laboratory work we have used a shorter time. After using this method for two years, while we do not consider it perfect, we believe it far superior to any other method which has been proposed.—Earle L. Davies.

THE VALUE OF SHODDY IN MECHANICAL RUBBER GOODS.

A chart was presented which gave the cost relations between scrap rubber and reclaimed rubber. The reclaimed rubber was evaluated on a basis of tensile strength and compared to a corresponding priced new rubber. A line of demarcation through the center of the chart showed where it was more economical to use new rubber or reclaimed rubber.—J. M. Bierer.

RUBBER CHEMISTRY FROM THE COLLOIDAL VIEWPOINT.

The mechanism of crystallization, condensation, polymerization and coagulation was discussed. Gelation is one type of coagulation. Selective adsorption is given as a reason for the increased tensile strength of compounded rubber. This deals with the different surface energy of rubber and the various compounding ingredients.—Ellwood B. Spear.

JAR RINGS AND POISONED OLIVES.

NUMEROUS FATAL CASES of poisoning due to eating olives put up in glass jars have occasioned an inquiry by the United States Department of Justice as to the part alleged to have been played by rubber rings on jars. The president of one large packing concern in California, who started the investigation, claims a conspiracy by Germans during the war to poison this food product. He believes that the company from which he bought all its rubber vacuum jar seals for the olives put up in 1917 was victimized by sympathizers of Germany; and he is confident that analysis now being made by government chemists of the rubber used and the toxins said to have been produced in the olive solution, will confirm his claims.

His company, he said, lost $100,000 in spoiled goods, the first and only packs giving trouble being those of 1917 and 1918, and in which the suspected rubber was used. He believes that some enemy agents tampered with the rubber mixture in the making, not only by causing it to deteriorate in a short time, but that they also introduced into the rubber germs of a malignant disease. As soon as the rubber gave way, air entered the jars and the "bugs" produced toxins in the olives. Had the rubber been "glycerined" he believes the trouble might have been lessened or obviated. Careful checking, he says, showed that goods with perfect seals—the same olives being used—gave no trouble at all.

The Chicago concern which supplied the jar rings, received complaints from many other purchasers about similar goods, and the explanation given was that the company had trouble in getting pure rubber owing to the Government's demands for war needs.

As the federal government investigation findings may not be disclosed for a year, private agencies are trying to find out on their own account if it is likely the rubber seals could be poisoned in the manner suspected.

According to bacteriologists the olive-poisoning was caused by a bacterium known as botulinus, first isolated by German savants from spoiled sausage meat, although it is also found in canned animal products which have been known to cause ptomaine poisoning. It is described as obligate anaerobic, that is, it thrives best when deprived of oxygen or common air, and needs neither to develop a powerful toxin. It is possible, it is believed, to embed spores from such bacteria in suitably prepared rubber so that they might after a certain period and under favoring conditions harmfully affect foodstuffs in contact with such rubber. The fact that the spores are remarkably tenacious of life lends some color to the story that the poisoning was timed by enemy agencies through a rotting of rubber seals.

Certain it is, say the bacteriologists, that dry heat at 230 degrees C. will kill the botulinus, and it can also be destroyed by prolonged boiling at 212 degrees F.

On the other hand, the processes of rubber manufacture, specifically jar-ring making, are not perhaps understood by the scientists. They agree that sufficient heat will kill the germ. Granting that a germ-distributing German introduced the bacteria into a batch of ring stock on a mixing mill, the germs during the process of mixing would be subjected to a heat equal to that of boiling water for at least fifteen minutes. If the stock went at once to the tubing machine and was run off it would get another fifteen minutes of the same heat. Or if the rings were made by wrapping the stock in sheet form about a mandrel the heat of the warmer and the calender would be considerable.

The real exposure to heat, however, would be during vulcanization. Here the germ would have to stand certainly 300 degrees F., say for an hour and a half, depending of course, upon the grade of stock used.

In addition to this would be the presence of zinc and sulphur, which are certainly not germ food. It must be a fairly robust germ, extraordinarily tenacious of life that will survive entombment and vulcanization in a jar ring.

RUBBER FOOTWEAR ACTIVE.

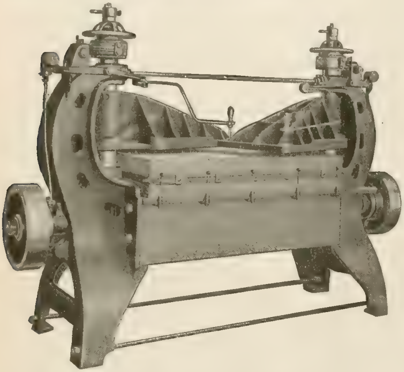
Present indications encourage the belief that the year 1920 will establish the record to date in the demand for rubber footwear of all kinds. An exceptionally snowy winter, which did not get its stride until after the new year came in, taxed manufacturers of arctics, overs and boots to capacity. With the passing of Easter and the coming of numerous signs of an early spring, other lines came to the front. Thus far, the demand for seasonable goods has been unusually large, and the variety of handsome styles of rubber and fabric shoes is great enough to attract many away from leather shoes for summer wear, especially in view of the continued high prices of leather shoes.

The less expensive athletic and outdoor shoes are rapidly increasing in popularity, affording economy, durability, comfort and attractiveness. Incidentally the high cost of leather footwear is increasing the demand for overs and footholds in order to protect the leather from water damage. Rubber boots are becoming regarded more and more as a necessary part of every man's outfit, and a comparatively new foot covering known as the rubber bootee is coming into popularity. It resembles the arctic overshoe, but has the quality of a rubber boot as far as it goes. Thus in many ways rubber footwear in its varied forms is rivaling leather footwear and for many purposes in certain seasons is a very practical "substitute."

New Machines and Appliances.

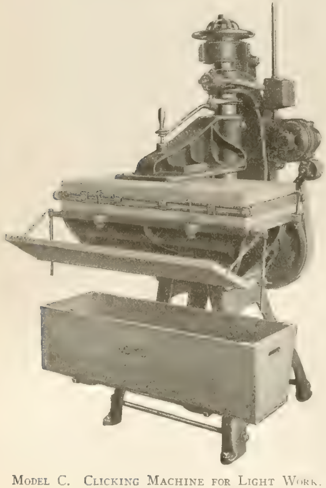
IMPROVED CLICKING MACHINES.

Fabric cutting practice in the rubber factories of this country is showing a strong tendency toward the use of clicking machines in place of the old-style beam dinker. Two types are used—one for quantitative and qualitative cutting of all fabrics, and the other on work of a lighter nature.



Model B. Clicking Machine for General Work.

In the use of the clicking machine many advantages are claimed over the old-fashioned method; it eliminates the great liability of injury; it is less laborious to operate, and it is more economical in the use of materials, in that the percentage of scrap is reduced to the minimum.



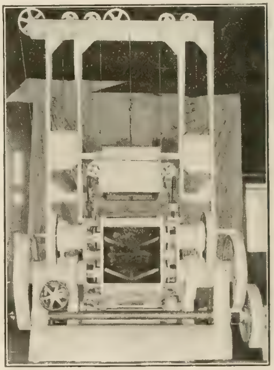
Model C. Clicking Machine for Light Work.

The cutting block of the ordinary dieing-out machine is a very inconvenient height and some of the dies are heavy and hard to move. In the clicking machine the working surface is at a restful height and in plain view; the die is light in weight and easily shifted and practically all danger of operating has been eliminated. With the fabric directly below his eyes on the cutting board the workman can place his dies on the clicking machine to cut more economically.

One of the greatest advantages claimed for the clicking machine is the accuracy of its work. On the beam dinker a heavy die is forced through many thicknesses of fabric, causing the material to spread, thus producing inaccurate cutting. (United Shoe Machinery Corporation, Albany Building, Boston, Massachusetts.)

A NEW ENCLOSED MIXING MACHINE.

In the accompanying illustration is shown a mixing machine of the enclosed type, possessing structural features that are designed to produce a maximum product in a minimum of time.



The Elmco Mixer.

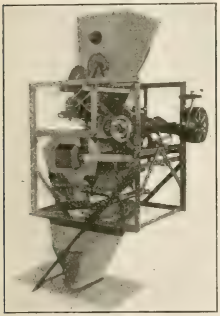
The frame of this machine is of substantial construction and sufficiently high so that the clearance of the mixing tank from the floor is at least 30 inches when tilted. The mixing tank is made of close-grained gray iron casting and jacketed and the inside is machined smooth. The heads are also made of close-grained gray iron casting, and are fitted with special stuffing boxes. The agitator is of special design, capable of mixing the rubber with the compound thoroughly. The agitator shafts are hollow and provided with heating or cooling fixtures.

The dust-proof feed-hopper is clamped tightly on the mixing trough when the machine is in operation. It contains separate compartments for the various materials, which are fed into the mixing trough by a compression feeding device that forces the required amount into the mixing trough. To increase efficiency, a dustproof compression cover can be raised sufficiently high to allow the dumping of the mixing tank for discharge. Means are provided for tilting the mixing tank either by hand or power.

This type of machine is only built in 75 gallons capacity, weight 3,400 pounds. (The East Iron Machine Co., Lima, Ohio.)

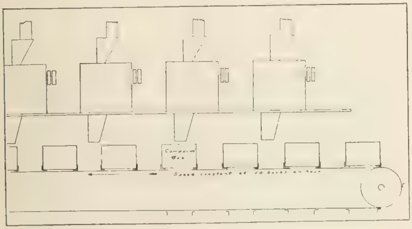
AUTOMATIC MACHINE FOR WEIGHING RUBBER INGREDIENTS.

In "Rubber Machinery," by Henry C. Pearson, the possibilities of an automatic machine for weighing compounding ingredients was suggested. "It is a swift, accurate and secretive weighing mechanism which works faster than any expert human weigher. The suggestion is that a gang of these machines could handle the ingredients that go to make up a compound, one machine to weigh whiting, another litharge, still another sulphur, and so on. Each machine takes its material from a bin, weighs it and delivers it into a common pan."



Automatic Pigment Weigher.

The realization of this prophecy is shown in the two illustrations herewith—one of the actual machine and the other, an installation plan of several machines. Each machine automatically weighs a different ingredient and discharges it into the compound boxes as they pass under each machine. (Automatic Weighing Machine Co., Newark, New Jersey.)



Section of Six-Gang Compound Weighing Installation.

PEERLESS DUPLEX HACK-SAW BLADES.

This radical improvement in hack-saw blades consists in fine teeth at the toe and coarser teeth at the heel of the blades. The advantages of this design are obvious to every hack-saw user. At the beginning of the cut and on each succeeding stroke, the fine teeth at the toe of the blade cut easily and true at the slow starting speed, preparing the way for the faster cutting of the coarser teeth which come into play at high speed, as the rest of the blade enters the work.

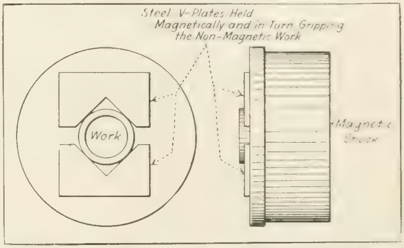
Peerless duplex blades are made in two types; all hard tungsten steel and flexible carbon steel. The former is especially adapted for use by tool makers in cutting tough steels, and by expert mechanics for general use.

The carbon steel flexible type is hardened on the tooth edge only. The remainder of the blade is only toughened to prevent excess stretch when tensioned. In plumbing, electrical and steam-fitting work, or in other trades where the material to be cut is of thin, irregular section, and where the work cannot be held rigidly in a vise or reached from an easy sawing position, it is the first choice of all good workmen. (Peerless Machine Co., Racine, Wisconsin.)

MAGNETIC CHUCKS.

Milling, planing, grinding and turning machines are now being equipped with magnetic chucks that have fully demonstrated their superiority over the old-fashioned jaw-chucks.

An interesting development is the use of magnetic chucks for grinding rubber gaskets and hard rubber electrical products. This is accomplished by two steel plates provided with "V" slots that grip the work through action of the magnetic chuck on the steel plate. This will be more readily understood by reference to accompanying illustration. This particular work is

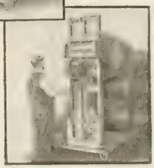


Rubber Gaskets or Hard Rubber Articles Held in Magnetic Chuck of Surface Grinder.

carried out on rotary surface grinders that are arranged with rotary magnetic chucks and are very accurate and fast for this class of work. (The Heald Machine Co., Worcester, Massachusetts.)

PORTABLE ELEVATOR OR PILING MACHINE.

This portable elevator for elevating cases, bales, barrels, etc., for piling purposes, is a combined hand and motor operated machine. It is similar in construction to hand-operated and motor-operated portable elevators, but is equipped with a crank for hand operation, and with a small motor, the cord and plug of which may be conveniently attached to an ordinary lamp socket. The motor is small enough to be thrown directly on the line without the use of a starting box and is controlled by a simple knife-switch mounted on the elevator. The change from one form of operation to the other may be instantly effected.



Upper View Hand Operated

Lower View Motor Operated

The Combination Revolvator.

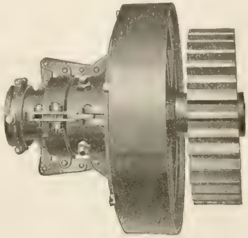
The advantage of this feature is apparent. The elevator may be operated by motor wherever current is available and by hand in those odd corners of the plant where current is unavailable. When operating by motor the manual labor of cranking is eliminated and a load as heavy as 1,800 pounds may be raised at approximately three times the speed attained by the average man operating by hand.

The machine may be furnished with any one of three different types of bases, revolvable, non-revolvable, or open and for use in connection with skids. The motor attachment may be fur-

nished for application to any hand-operated portable elevator. (Revolvator Co., Jersey City, New Jersey.)

A DISK TYPE FRICTION CLUTCH.

The simplicity of construction and the mechanical features embodied in the friction clutch here shown should recommend its use to rubber engineers.



THE PLAMONDON CLUTCH AND GEAR.

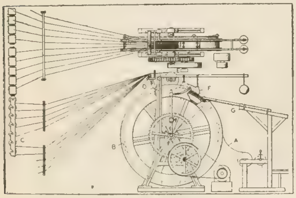
The continuous friction surfaces consist of three parts that are dust proof. The friction plate on the standard clutch is lined on both sides with continuous hard maple segments and can be removed for relining without disturbing the other parts. For special conditions the friction plate may be fitted with asbestos fiber, vulcanized fiber, or other friction surfaces. The pressure developed by the double toggles is such that the larger sizes of clutches are readily engaged and disengaged by means of ordinary hand levers, without the use of geared operating devices. The positive action of the double toggle movement in both directions, engages and disengages the clutch without the use of springs. The adjustment for wear is made entirely by one adjusting collar only, giving a uniform pressure on all parts of the friction surfaces. (A. Plamondon Manufacturing Co., 12-24 North Clinton street, Chicago, Illinois.)

MACHINERY PATENTS.

MACHINE FOR MAKING STORAGE BATTERY SEPARATORS.

A COMPOSITE BODY of rubber and fibrous material for making porous battery separators is formed on the machine here shown in side elevation and plan.

A strip of soft uncured gum *A* is fed on the steam heated drum *B*, and a large number of cotton threads from spools *C* are passed over guide *D* and around pressure roller *E*. Supplementing the internal heat of the drum, external heat is applied to the rubber strip by the curved iron *F* attached to the pressure-roller lever. As the drum revolves the threads are practically embedded in the soft rubber strip in a substantially side-by-side position extending across the periphery of the drum.



BATTERY SEPARATOR MACHINE.

When a strip of the desired thickness is formed, it is cut transversely and run off the drum by means of the chute *G* to a receiving table. A suitable number of these strips are superposed and compressed in a press vulcanizer where the composite body of rubber and fiber is semi-cured, after which it is cut into sections of the proper thickness. (Harry L. Boyer, assignor to Joseph Stokes Rubber Co., Trenton, New Jersey. United States patent No. 1,330,976.)

OTHER MACHINERY PATENTS.

THE UNITED STATES.

NO. 1,333,882. Apparatus for trimming heel-pads, rubber soles and tips for boots, etc. J. Sumner, Leyland, assignor to Wood Milne, Limited, Manchester—both in England.

1,333,927. Tire-making machine. E. C. McGraw, assignor to The McGraw Tire & Rubber Co.—both of East Palestine, O.

1,334,185. Machine for making tire casings. W. C. Stevens, assignor to Firestone Tire & Rubber Co.—both of Akron, O.

1,334,629. Mold for tires. M. L. Munger, Lincoln, Neb.

1,335,101. Air bag with removable outer surface layer, for vulcanizing pneumatic tires. F. Fenton, assignor to The Miller Rubber Co.—both of Akron, O.

1,335,124. Apparatus and method for removing entrapped air from uncured rubber articles. T. Midgley, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls—both in Massachusetts.

1,335,150. Mold and process for making tires. P. I. Anderson, Des Moines, Ia.

1,335,353. Air bag for vulcanizers. J. H. Smith, San Francisco, Calif.

1,335,783. Repair vulcanizers. A. A. Dorsey, Lawrence, Kans.

1,335,879. Apparatus and method for building pneumatic tires. B. Darrow, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

1,336,220. Repair vulcanizer. W. A. Gwynn, assignor to S. E. Gwynn—both of St. Louis, Mo.

1,336,319. Machine for placing washers in rubber-heel molds. B. W. Martin, Zanesville, and H. Sams, Akron—both in Ohio.

1,336,328. Apparatus for wrapping and unwrapping tires. C. Ziegler, Barberton, O.

1,336,329. Apparatus for wrapping and unwrapping tires. C. Ziegler, Barberton, O.

THE DOMINION OF CANADA.

197,732. Tire-opening machine. W. C. Stevens, Akron, O., U. S. A.

197,785 Vulcanizing machine. The City Trust Co., assignee of J. Porzel—both of Buffalo, N. Y., U. S. A.

198,140. Apparatus for applying cushion tires to rims. W. C. Stevens and C. W. Steele, coinventors—both of Akron, O., U. S. A.

198,158. Machine for pressing rubber. C. H. Allred, Medicine Hat, Alta.

198,477. Repair vulcanizer. M. L. Munger, Lincoln, Neb., U. S. A.

198,558. Apparatus for separating tires from cores. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of J. J. Shea, Hartford, Conn., U. S. A.

198,565. Tire cutting or trimming machine. The Goodyear Tire & Rubber Co., assignee of E. A. Nall—both of Akron, O., U. S. A.

198,610. Apparatus for supporting tire casing and spreading beads. E. Ramsdell, assignee of F. M. Case—both of Cleveland, O., U. S. A.

198,816. Vulcanizing apparatus. Firestone Tire & Rubber Co., Akron, assignee of O. F. Beck, Lawndale, and J. W. Speers and R. R. Jones, both of Akron—all in Ohio, U. S. A.

198,822. Segmental tire-core. The Goodyear Tire & Rubber Co., assignee of C. Wattleworth—both of Akron, O., U. S. A.

198,823. Interlocking tire-mold. The Goodyear Tire & Rubber Co., assignee of C. Wattleworth—both of Akron, O., U. S. A.

THE UNITED KINGDOM.

137,569. Drive for rubber mill F. Iddon, School Lane, Leyland, Lancashire.

137,820. Rubber mixer. Farrell Foundry & Machine Co., 30 Main street, assignee of D. R. Bowen, 5 Clover street, and C. F. Schnuck—all of Ansonia, Conn., U. S. A.

AUSTRALIA.

To Americans.

11,963. Machine to shape fabric for cord tires. J. D. Thomson, Ohio, U. S. A.

11,330. Press for hollow rubber articles. W. Spruson, for F. T. Roberts and R. H. Rosenfeld, Cleveland, O., U. S. A.

GERMANY.

321,106. Mold for solid rubber tires, casings, and the like. Leonhard Herbert, Frankfort am Main. (Date of application, October 13, 1918.)

PROCESS PATENTS.

THE DOMINION OF CANADA.

NO. 197,734. Manufacture of cushion tires. F. W. Strong, Dallas, Tex., U. S. A.

197,784. Vulcanizing rubberized fabric or sheet rubber. The City Trust Co., assignee of Joseph Porzel—both of Buffalo, N. Y., U. S. A.

198,686. Manufacture of solid tires, with means to permit escape of entrapped air during vulcanization. D. E. Goodenberger, Akron, O., U. S. A.

198,772. Manufacture of tires from cord fabric. J. C. Tuttle, Akron, O., U. S. A.

198,821. Preparation of tire tread and side wall stock. The Goodyear Tire & Rubber Co., assignee of B. Darrow—both of Akron, O., U. S. A.

THE UNITED KINGDOM.

137,948. Finishing fabric by beetling roll of alternate layers of rubber or rubberized fabric and the fabric to be finished, etc. J. H. Wrigley, 4 Darley Road, Whalley Range, Manchester, and A. B. Henshilwood, 1430 Leeds Road, Thornbury, Bradford, Yorkshire.

AUSTRALIA.

To Americans.

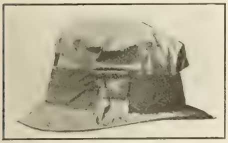
10,077. Molding rubber balls. W. J. Spruson, for F. T. Roberts and R. H. Rosenfeld, Cleveland, O., U. S. A.

11,667. Retreading pneumatic tires. S. H. Goldberg, Chicago, Ill., U. S. A.

New Goods and Specialties.

A BRITISH RUBBER HAT.

THE SPRING trade in Britain is reported to be brisk in weatherproof and rainy-day hats, some of which are of oiled silk combined with velvet, others of oiled silk entirely. The woman's hat shown here, however, is of most interest to the rubber trade because it is made of rubber. It has a full, one-piece crown and a plain brim, wired, while the trimming consists of a band and bow of rubber of a contrasting color. The edge is of the same color as the trimming and the hat is lined but not reversible as are some of the models of oiled silk or mackintosh material. These hats are said to be in good demand in overseas markets as well as in Britain. (Edward Macbean & Co., Limited, Glasgow, Scotland.)



("The India-Rubber Journal.")
THE RUBBER HAT ABROAD.

BATHING CAPS OF THE SEASON.

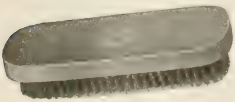
Three attractive bathing caps pictured below represent some of the newer models which are being displayed at the present time. They are made of high-grade rubber in different colors trimmed with ornaments of contrasting shade. The "Victory" at the left is polka-dotted in white and has a full shirred body

"VICTORY" CAP. "SERVICE" CAP. DIVING CAP.

with enclosed sponge rubber head-band, this latter feature being patented, while an ornament finishes the top. The center cap, "Service," is patterned after a service cap. The seams are bound with rubber of contrasting color and the front is decorated with stars. The cap at the right is a large diving cap, having a round crown to which the body of the cap is neatly and securely bound. A buckle ornament in contrasting colors constitutes the trimming on one side, and the head-band is in two colors. (The Faultless Rubber Co., Ashland, Ohio.)

A BRUSH FOR THE HANDS AND NAILS.

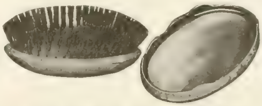
Brush manufacturers, seeking to meet the popular demand for brushes having the bristles set in rubber, are putting something novel on the market every now and then. The brush at the left is for cleaning the nails and is made of the best black bristle securely vulcanized in a rubber block. It can be sterilized in boiling water without danger of the back coming off or splitting, a feature which appeals to those who insist on having personal belongings thoroughly sanitary.



"O. D. S." NAIL-BRUSH.

POCKET HAIR-BRUSH AND MIRROR.

Women will appreciate the novelty illustrated here—a sanitary hair-brush which, with its mirror-lined cover, forms a pocket case of great convenience. The brush itself is of high-grade black bristle set in a rubber cushion which can be removed for the purpose of sterilizing. This is accomplished by light pressure of the finger and is replaced as easily. The cover contains a mirror. The aluminum case is light in weight and non-corrosive. Both the nail-brush and the hair-brush are made by the same concern. (O. Dennin's Sons, Inc., Troy, New York.)



"O. D. S." POCKET HAIR-BRUSH AND MIRROR.

THE "ERIE CORD" TIRE.

One of the latest additions to the growing list of cord tires is the "Erie Cord." The design of this tire is both rugged and attractive with a remarkably bulky anti-skid tread of the highest quality of rubber composition. "Erie Cords" have been satisfactorily demonstrated in service tests and are being guaranteed for 12,000 miles. (The Erie Tire & Rubber Co., Sandusky, Ohio.)

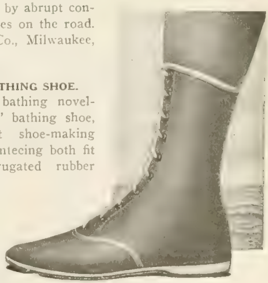
"ERIE CORD" TIRE.

LUDINGTON ARMORED PNEUMATIC TIRE.

The Ludington armored pneumatic tire casing contains a layer of thin, flexible, resilient brass plates reinforcing the carcass from bead to bead, interposed as a layer dividing the fabric plies into two groups. The plates are laid snugly, edge to edge, at the tread but separate as they approach the bead. Above and below the layer of plates are thick plies of cushion rubber which unite along the side walls and prevent separation of the inner and outer layers of fabric plies, while the metallic layer serves to prevent both punctures and blow-outs. Each plate is corrugated midway between tread and bead to allow transverse movement for equalization of the air pressure and to obviate possible breakage of the plates by abrupt contact with hard obstacles on the road. (Ludington Rubber Co., Milwaukee, Wisconsin.)

RUBBER-SOLED BATHING SHOE.

Among the latest bathing novelties is the "Bruxshu" bathing shoe, embodying the best shoe-making principles, thus guaranteeing both fit and style. A corrugated rubber sole is fastened to the usual upper of fabric by a special patent process, and in some models there is a leather counter to support the back and low rubber heels to add to the wearer's comfort in walking on the beach. These shoes, it is claimed, will wear an entire season. (Brooks Shoe Mfg. Co., 1735 North Sixth street, Philadelphia.



THE "BRUXSHU" BATHING SHOE.

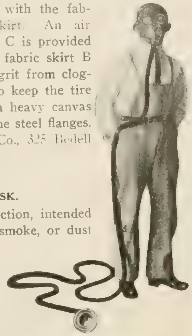
A NEW THREE-IN-ONE TIRE.

The "Luck Botherless" tire claims to provide against rim cuts, blow-outs, punctures, sand blisters, etc., by its ingenious construction. The inner tube D is enclosed inside the fabric skirt B, which bears the rubber tread cushion G and is, in turn, inclosed within protective flanges of steel, fastened with eight bolts to the felloe E of the wheel. These flanges extend from near the bottom of the felloe to above the juncture of the solid rubber tread with the fabric skirt. An air space C is provided between the flanges A and the fabric skirt B of the tire, to prevent mud or grit from clogging. It also has a tendency to keep the tire cool. The beads have an extra heavy canvas covering and are protected by the steel flanges. (Luck Tire & Manufacturing Co., 325 Bedell Building, San Antonia, Texas.)

"Luck Botherless" Tire.

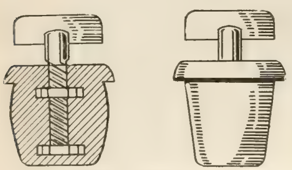
GAS OR SMOKE MASK.

A mask of improved construction, intended to protect workmen from gas, smoke, or dust is made of aluminum and rubber, as illustrated. It has an inflated face rim and is fitted with specially constructed spiral tubing so flexible that the natural air supply cannot be cut off by twisting or knotting. The tubing is carried by a belt and the head-piece fastens with adjustable elastic straps. (Improved Aluminum Gasco Protector Co., Chicago, Illinois.)


"Gasco" Protector.

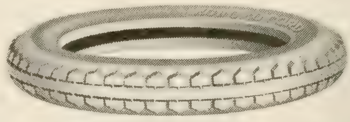
EXPANDING AND CONTRACTING STOPPER.

No more unpleasant experiences with corks that do not fit the containers for which they are needed or that break in extraction. The one here pictured is a welcome novelty, indeed. It is made of pure red rubber, molded around a nickel screw, traveling between two brass washers, firmly embedded and keyed in the rubber. This screw is swiveled in the lower washer to turn without engaging the thread. As the screw is turned to the right, the upper washer is brought closer to the lower one, thus expanding the rubber in between so as to enlarge its diameter, as illustrated in the cross-sectional view. The reverse movement forces the washers apart, elongates the rubber, and provides positive contraction, permitting the stopper to be easily withdrawn from the bottle or container. (The Sampson Appliance Corporation, 13 East 16th street, New York.)


"Sampson" Adjustable Stopper.

A SILVER ANNIVERSARY CORD TIRE.

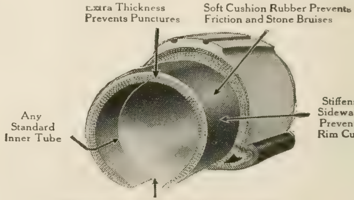
The new cord tire herewith illustrated, produced to celebrate the silver anniversary of pneumatic tire production, has a distinctive twin grip tread, with a center rib to support the weight of the automobile, while on either side there is a row of pavement-gripping wedges intended to stop any tendency to skid laterally. The color combination produced by the white tread and gray side walls is one which harmonizes with the finish of any car. (The Kokomo Rubber Co., Kokomo, Indiana.)


"Kokomo Cord" Tire.

NOVEL SUB-TIRE.

A novel sub-tire that slips within any tire casing is made in all standard sizes and is said not only to protect the casing, but to double its life and prevent blow-outs.

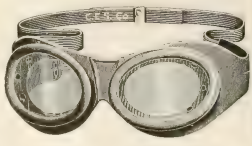
Many automobile users seem to prefer the sub-tire to the uncertainties of retreading. An additional safeguard against injury to inner tubes is said to be provided by the sub-tire, and the general wheel resiliency much enhanced. Although the product is but a new one, the sales now reach $100,000 a year and the rapid growth of the business has necessitated the recent removal of the plant to larger quarters. (Planet Rubber Co., 223 East 9th street, Los Angeles, California.)



Planet Sub-Tire

RUBBER SUIT AND SAFETY GOGGLES.

The diverse operations carried on in the modern industrial factory make an insistent demand for adequate protection for the workman. The rubber suit shown here is acid, fire and waterproof, provided with snap buttons on front and at wrists and ankles. The rubber-rimmed goggles are air and gas tight, held by elastic straps. (The Safety Equipment Service Co., 2044 East Ninth street, Cleveland, Ohio.)


Rubber Rimmed Goggles.


"Protexal" Suit.

THE SALVAGING OF TRUCK TIRES BY THE ARMY.

To efficiency experts in the United States Army service, few things had been more distressing than the practice among soldiers of removing solid motor truck tires by direct application of heat. For a long while officers charged with the correction of wasteful methods vainly experimented in the hope of finding a better method. The difficulty lay, of course, in the adhesion of the hard rubber layer to the metallic wheel-bands. The soldiers removed the tires from the wheels easily enough but much rubber was ruined by heat and lessened in value as scrap, and generally the hard rubber base remained with the rubber.

The heat process was a makeshift at best, for often spoilage quite equalled salvage. Usually a dozen tires were piled on top of one another, being raised from the ground by bricks or stones, and the cracks between the rims were plastered with mud. A wood fire was built in the stack thus created, and in about five minutes the tires would fall off, provided they had been notched all the way through at one point before heating. The mud was used to keep the flames from coming through the cracks and burning the rubber, but too often it failed in its purpose.

Finally an improvement on the heat method was evolved at Camp Logan, Texas, and the process proved so satisfactory that a general order was issued by the United States Army Director of Purchase and Storage in Washington to all depot, camp and post supply officers to discard all other methods of removing rubber from steel bands and employ that devised at Camp Logan. The instructions were as follows: provide two posts or trees about 10 feet apart; a double and a single ⅝-inch block; 30 feet of ½-inch rope; two heavy steel knives 14 by 2 inches; two carpenters' 2½-inch wood chisels; a pricker to remove stones from rubber; one steel ring or a half dozen 6-inch rings of hay wire, doubled.

The tire is placed against the post, resting on the ground in an upright position and the rope wrapped once around the tire, then around the post and tied so that the tire may be shifted easily. On the other post the rope is wrapped twice and tied permanently about three feet from the ground. The double block is hooked on the post with a permanent tie and the single block played out to the tire.

With the knife cut across the top of the tire at a 45-degree angle, down to the iron rim and nick each side of the tire at the base of the cut. Slip one of the hay wire rings into the cut and pull tight to catch in the nicks at the sides of the rubber, hooking the single block in the wire ring.

One operative, handling the tackle, tightens up on the tire carefully to start the rubber; a second operative helps to handle the tackle and steady the tire, and a third, using the wood chisel, cuts in at the edges where the rubber hangs.

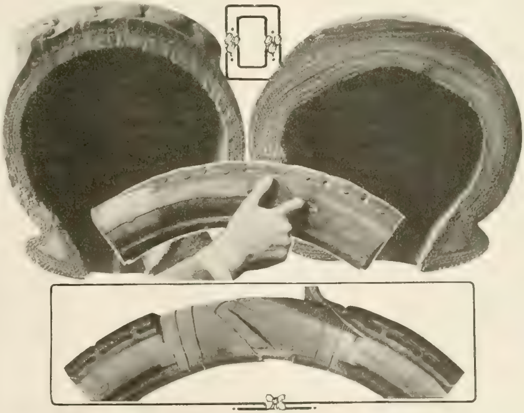
As the blocks are steadily pulled, the rubber peels down to the cement, leaving the fabric and cement on the iron band.

United States Army Method of Stripping Solid Truck Tires. Heat Process Shown in Insert.

When the tire is peeled to the ground, it is shifted upward, the rubber again nicked at each side, the hay wire ring loosened from the peeled section and placed in newly cut nicks. The blocks are again attached and the peeling finished.

THE RIGHT AND WRONG OF A BLOW-OUT REPAIR.

The most frequent mistake made by repair men in repairing a blow-out is failure to remove the worn fabric from the injured portion of the tire, the tendency being to add rather than replace layers of fabric. Here are shown three views of a four-inch, five-ply fabric tire which was repaired by adding eight plies of new fabric to the five plies of worn fabric in the tire. After running a few hundred miles the tire blew out again. It was found on examination that eight plies of extra fabric extended to the point of the blow-out. In running, a "hinge" had formed at the merging point of the five- and the thirteen-ply sections that worked backward and forward, thus weakening the structure and causing the blow-out.



Unsuccessful Tire Repair Pictured. Upper Left—Cross Section Five-Ply Tire before Repairing. Upper Right—after Repairing, Thirteen Plies Instead of Five. Center Picture—Blow-Out Occurred at Merging Point of Five and Thirteen Plies. Lower—Correct Method of Fabric Preparation.

The lower picture shows a tire stripped back in the approved method of repairing a blow-out. All the fabric, except just enough for a foundation, has been removed in steps to avoid sharp breaks between the old and the new fabric. The repair man then begins the process of building up, carefully following the standard of practice and using only the best materials available.

THE OBITUARY RECORD.

A GREAT MAN IN THE TELEPHONE INDUSTRY.

Theodore Newton Vail, chairman of the board of directors of the American Telephone & Telegraph Co., of which he had been president until last June, and also a director of the United States Rubber Co., died April 16, 1920, at the Johns Hopkins Hospital in Baltimore, of a complication of heart and kidney diseases, after a surgical operation had proved ineffectual. He had been brought to the hospital from Jekyll Island, off the Georgia coast, where he had passed the winter. He was in his seventy-fifth year, having been born June 16, 1845, in Carroll County, Ohio.

Theodore N. Vail.

Mr. Vail's name is written as indelibly in the history of the telephone as is that of Alexander Graham Bell, for his executive ability and faith in the invention were as essential to its successful practical establishment as were Bell's experiments.

Vail rose from the ranks. His family had moved to Morristown, New Jersey, when he was an infant, and there he went to school and attended the Morristown Academy, intending to be a doctor. He learned telegraphy and when he was twenty-one went West with his parents; there he worked for the Union Pacific railroad and attracted the attention of General Grenville M. Dodge, who had him appointed a clerk in the railway mail service. He organized the service so well that by 1876 he had been called to Washington as assistant, and soon after as chief superintendent.

He left the government service in 1878 to become general manager of the new Bell Telephone Co. The hard fight he made to put the company on its feet is one of the epics of American industry. Very soon he saw the possibilities of the long-distance service and fought hard to secure the capital for the lines from Boston to Lowell and to Providence, that demonstrated the feasibility of the idea. In 1885 he became president of the American Telephone & Telegraph Co. that was to develop that side of the business. By 1887 he was obliged to give up and attend to his health, when he retired to his farm at Lyndonville, Vermont.

In 1893 he visited South America and his spirit of enterprise was again aroused. At Buenos Aires he bought a horse-car line, applied electricity, established a telephone system, and devoted ten years to developing Argentina. In 1904 he retired again, returning to his Vermont farm. Then he lost his wife and his only son, and in 1907 was ready to accept the call to return to the presidency of the American Telephone & Telegraph Co. and try to straighten out its affairs. In three years he was enabled to buy out the company's old competitor, the Western Union, and in 1910 became president of that company also. In 1914 the two were to have been amalgamated, but the Government stepped in to forbid it. With the outbreak of the war and the Government taking control of both systems, Mr. Vail was put in charge, remaining at the head of both till they were returned to their owners. This was only one of his many activities during the war. In June, 1919, he finally gave up the presidency of the American Telephone & Telegraph Co.

The large use of rubber in the telephone business, as insulating material for instruments and their parts, and for other purposes, naturally interested Mr. Vail in rubber. He shared in the development of the United States Rubber Co., and for some years has been a director.

Harvard, Princeton, Dartmouth and Middlebury conferred on Mr. Vail their honorary degree of Doctor of Laws, the University of Vermont made him a Doctor of Science and New York University a Doctor of Commercial Science. In 1912, Mr. Vail presented to the Massachusetts Institute of Technology the library of George Edward Deering, said to be the most nearly complete collection of books on electricity in the world; for this he is believed to have paid $100,000. He also founded the Lyndon Agricultural School at Lyndon, Vermont.

Mr. Vail, besides being a director in many business concerns, was a trustee of the Boston Museum of Fine Arts and a director of the Boston Opera House, a member of the Metropolitan Museum of Arts, American Geographical Society, American Natural History Society, American Academy of Political and Social Science; of the New York, Union League, New York Athletic, Automobile of America, Metropolitan, Hobby, Jekyl Island, National Arts, Railroad, Sleepy Hollow, Westchester Country, Larchmont Yacht, Union and other clubs; and of the Sphynx and Royal Automobile Clubs of London.

In 1907, Mr. Vail married the second time and is survived by his widow.

Professor Karl Dieterich, Ph.D., director of the Helfenberg chemical factory, died in Dresden at the end of March, age 51 years. He was interested in the employment of rubber and cognate materials in pavements, and published investigations in rubber and resins.

STATEMENT OF INDIA RUBBER WORLD.

Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, of The India Rubber World, published monthly at New York, New York, for April 1, 1920.

State of New York, }
County of New York. } ss.:

Before me, a notary public in and for the State and county aforesaid, personally appeared E. M. Hoag, who, having been duly sworn according to law, deposes and says that she is the business manager of The India Rubber World, and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, The India Rubber Publishing Co., 25 West Forty-fifth street, New York City.

Editor, Henry C. Pearson, 83 Agawam Road, Waban, Massachusetts.

Managing editor, none.

Business manager, E. M. Hoag, 25 West Forty-fifth street, New York City.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.)

Henry C. Pearson, 83 Agawam Road, Waban, Massachusetts.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by her.

E. M. Hoag, Business Manager.

Sworn to and subscribed before me this 31st day of March, 1920.

[seal] Thomas P. Burke, Notary Public.

My commission expires March 30, 1921.

INTERESTING LETTERS FROM OUR READERS.

RUBBER AND METALLIC SUBSTANCES APPLIED TO CLOTH.

TO THE EDITOR:

DEAR SIR: I am writing to ask if you know anything of the process used in decorating cloth like the enclosed sample. I know it was an ancient art in India. The question is how to reproduce it with modern methods.

If you can refer me to any writing on the process of applying rubber to cloth which may be used with metallic substances, I shall be very grateful.

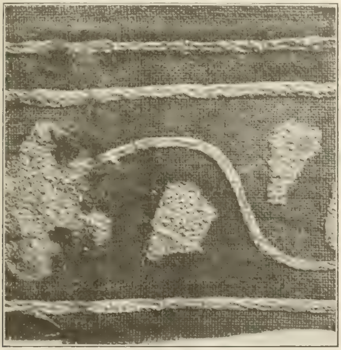
This is a technical subject about which I know very little and I was unable to get satisfaction from books.

I shall be very grateful to you for an early reply.

GRACE G. DENNY,
In charge of textile laboratory.
University of Washington, Seattle, Washington.

REPLY BY THE EDITOR.

The sample of cloth ornamented with gold flowers which you sent me is of exceeding interest. It may be a rubber product,



PERSIAN FABRIC ORNAMENTED WITH "GOLD AND RUBBER"

at least in part. The milk of a rubber tree, the *Ficus elastica*, was used in India more than a thousand years ago. It is probable that the rubber from it was also used. A native could easily make a thick rubber paste and apply it to fabric in crude lines of ornamentation; then, while still adhesive, dust it thickly with metallic powder. That used on the sample looks like pyrites. If it is, exposure of the decorated surface to the sun would result in the type of vulcanization known as solarization, or sun-cure, the three concomitants, rubber, sulphur (or a sulphide) and heat, being present. I do not, of course, assert that this is the fact, but it is not impossible.

I recall something of this sort of native work in Kuala Lumpur, F.M.S., where a coolie decorated his Chinese shoes with stripes in blue and crimson. The body of the stripe was freshly coagulated rubber exposed to heat to render the surface sticky. This was then dusted, one stripe with a blue powder, the other with a crimson. The whole was then thoroughly dried out in strong sunlight.

With regard to work of this type, in our own day Charles Goodyear did some very fine ornamental work on fabric and leather, using a thick rubber cement which was dusted over with "flock" of various colors. None of this work is in existence to-day, as far as I know.

Twenty-five to thirty years ago, when the rubber surfaced "gossamer" was popular, the unvulcanized surface was ornamented by applying starches, and in a few instances, metallic powders, after which the garment was cured.

To imitate the sample to-day, a thick paste of rubber applied from a collapsible tube in the form of decoration, this to be dusted while sticky with bronze powder, brass filings, or any mineral powder desired. If the rubber paste is to be sun-cured, it should contain sulphur. Or it could be cured in dry heat, or, containing no sulphur, be exposed to the fumes of chloride of sulphur. There is no doubt that very beautiful and permanent decorative effects could be obtained by the process outlined.

THE EDITOR.

SPECIAL LIBRARY CENSUS.

TO THE EDITOR:

DEAR SIR: At a time when the Government is counting up its inhabitants, the Special Libraries Association is enumerating the special library collections of the country, because there does not exist at present an adequate directory of special libraries.

In the spirit of cooperation. and in order to list the special information sources of the country, the Special Libraries Association—the national body of special librarians—submits the following questions and respectfully asks you to take the trouble to answer them. When compiled, the directory will not be used as a mailing list for advertisers, but merely for the purpose stated, namely, to have in a central place, a record of the special information sources of the country.

A special library has been defined as:

> A good working collection of information either upon a specific subject or field of activity; it may consist of general or even limited material serving the interests of a special clientele; and preferably in charge of a specialist trained in the use and application of the particular material.

If your library comes within the above qualifications, the Special Libraries Association will appreciate the following information from you:

(1) Name of institution or company.
(2) Name by which library is known.
(3) Name of librarian or custodian.
(4) Can it be classified as any of the following: Financial; business; legal; engineering or technical; institutional; municipal; reference; agricultural.
(5) If not, how can it be classified?
(6) Does it serve a special clientele?
(7) Would your librarian be willing to assist other special libraries to a reasonable extent?

The above data should be sent to William F. Jacob, Chairman Library Census Committee, care of General Electric Company, Schenectady, New York, who will be glad to answer any questions relating thereto.

ON EXPANSION OF RUBBER COMPOUNDS DURING VULCANIZATION.

TO THE EDITOR:

DEAR SIR: I have read with great interest the paper on the "Expansion of Rubber Compounds during Vulcanization," communicated by C. W. Sanderson to the Rubber Division of the American Chemical Society and reprinted in your journal, February 1, 1920. Mr. Sanderson states that one of the first questions which arose in connection with the expansion of rubber was whether or not there was a break in the curve, or, in other words, a volume change *at the point of vulcanization.* The author does not, however, explain what he means by the point of vulcanization, and, as matter of fact, vulcanization has now been shown to take place perfectly gradually although it increases more rapidly than the rise in temperature. He also states that "we know that a physical change takes place, and that the specific gravity increases." The specific gravity is,

however, presumably determined on the raw and vulcanized rubbers at room temperatures, whereas Mr. Sanderson's measurements of expansion have been taken at the temperature of vulcanization. The difficulty as regards the increased specific gravity of vulcanized rubber can probably be explained by assuming that vulcanized rubber possesses a greater cœfficient of temperature expansion than raw rubber so that although a given weight of vulcanized rubber may occupy a larger volume than that of raw rubber at the vulcanizing temperature, it may occupy a smaller volume at room temperature.

I therefore suggest that, to make the matter clear, Mr. Sanderson should amplify Conclusion 5, by stating definitely what he means by the point of vulcanization; and Conclusion 6 also may require modification unless it can be shown that the specific gravity of vulcanized rubber is greater than that of raw rubber at the temperature at which vulcanization is taking place.

HENRY P. STEVENS.

15 Boro', London Bridge, S. E. 1.

SANDERSON'S REPLY.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

DEAR SIR—Dr. Stevens' points are well taken, but I believe his objections will be met if I make my meaning clearer.

(1.) The phrase, "point of vulcanization" was perhaps an unfortunate expression to have used. I think everyone will agree that vulcanization does take place gradually and my experiments bear this out by showing that there were no breaks in the cures. By "point of vulcanization" I simply meant to describe that region of vulcanization to which rubber is cured in ordinary practice.

(2.) In discussing the changes in specific gravity I simply attempted to prove that the increase was due to the external pressure which is applied during the cure. I did this by comparing the results obtained under different degrees of external pressure. Samples cured with low external pressure showed almost no increase in specific gravity, while those cured with high external pressure showed considerable increase in specific gravity.

C. W. SANDERSON.

THE EDITOR'S BOOK TABLE.

"A TABLE OF TENSILE STRENGTHS OF RUBBER. BY HENRY W. Jacobsen and Joseph E. Partenheimer, 1919. Printed for the Fisk Rubber Co., Chicopee Falls, Massachusetts.

THIS publication consists of a series of tables arranged for ascertaining the tensile strength of rubber test pieces. The information sought is tabulated under the dimensions of the cross-section of the test piece arranged at the top of the table, with observed pounds' pull registered at the breaking point recorded at the side. This compilation will be found very convenient in eliminating calculations in testing laboratories where the routine calls for many tensile tests and quick information as to the results.

"THE METRIC FALLACY." BY FREDERICK A. HALSEY. THE American Institute of Weights and Measures, New York, 1919. (Cloth, octavo, 9¼ by 6 inches, 229 + 10 pages.)

Mr. Halsey's plea against the general adoption of the metric system appears, after fifteen years, in a second, revised edition, brought up to date, several chapters by Samuel S. Dale having been added.

"INORGANIC CHEMICAL SYNONYMS AND OTHER USEFUL Chemical Data." By Elton R. Darling, New York. D. Van Nostrand, 1919. (Cloth, 4½ by 7 inches, 100 pages.)

This book is the outcome of a series of articles dealing with the subject which appeared in "The Chemical Engineer" in 1918. It is prepared for the use of students, but will be found a convenience by the experienced chemist. About one-third of the book is taken up by various useful tables of data concerning the elements, specific gravity, temperature comparison, and standards of weights and measures. The remaining pages are devoted to lists of chemical synonyms in chapters arranged alphabetically by elements, each list being preceded by a brief account of the element, including its discovery and leading characteristics.

The book concludes with a cross-index of chemical names as an aid in finding true chemical names and other synonyms associated with them.

"INDUSTRIAL CHEMISTRY." A MANUAL FOR THE STUDENT and Manufacturer. Edited by Allen Rogers. Third Edition, 1920. D. Van Nostrand, New York. (Cloth, 6 by 9 inches, 1232 pages.)

The third revised edition of this standard work on industrial chemistry appears after an interval of five years since the publication of the second edition. It has been enlarged by over two hundred pages and seventy new cuts.

The chapter on rubber has been enlarged by the inclusion of new matter in nearly every section, although an exhaustive treatment of the subject is not attempted. The chapter closes with two pages of bibliography which includes references to certain important legal decisions in causes relating to rubber-working processes and products. The references to the literature of rubber are extremely few. No mention is made, under periodical literature, of the leading rubber journals of America, England, France, or Germany, all of which are important in the industrial field.

NEW TRADE PUBLICATIONS.

GUTTA PERCHA & RUBBER, LIMITED, TORONTO, CANADA, ISSUED its price list of "Maltese Cross" rubber footwear on March 1 for the season of 1920-21. Coincident therewith appeared an attractive 64-page illustrated catalog numbered S-24, showing the company's latest styles in boots, lumbermen's arctics, excluders, overs, slippers and footholds. It comprises a varied and interesting line of attractive appearance and well-known quality.

"THE THERMOID NEWS" IS THE TITLE OF A VERY NEAT SEMI-monthly factory paper published by the Thermoid Rubber Co., Trenton, New Jersey, for the benefit of its employes. It is full of helpful hints, practical talks on trade topics, and entertaining chats about the staff and operatives in the big Trenton plant. Chester A. Charles is editor, assisted by Fred Birkholtz, Harry W. Searfoss, E. W. Craft, Richard A. Kirk and P. Krier.

THE HABIRSHAW ELECTRIC CABLE CO., NEW YORK CITY, HAS ISsued a 16-page illustrated pamphlet entitled "1650," outlining succinctly and entertainingly the development of insulated wires and cables from Guericke's first experiment in 1650 to the present day. Incidentally some very interesting facts about the great Habirshaw industry are presented, together with several views about the firm's plant at Yonkers, New York.

THE CHICAGO CHEMICAL BULLETIN, PUBLISHED MONTHLY BY the Chicago Section of the American Chemical Society, has issued a pamphlet of 11 pages entitled "Chemists' First-Aid Treatment", by Paul Nicholas Leech. The emergency treatment of burns, abrasions, and bruises, and of internal conditions are treated briefly but adequately. There are also addenda from the "Handbook of Therapy" on poisons.

THE MOTOR & ACCESSORY MANUFACTURERS' ASSOCIATION ISSUES under the title, "The Triumph of Team-Work," a handsome pamphlet containing letters from many firms, praising the work of the association.

L. E. KNOTT APPARATUS CO., BOSTON, MASSACHUSETTS, IN their Catalog 24C present a valuable descriptive list of chemical and biological apparatus, the former of which are of interest to rubber chemists.

THE BUFFALO FOUNDRY & MACHINE CO., BUFFALO, NEW YORK, has selected a landscape of unusual beauty and brilliancy of color, Thomas Moran's "Castle in Old Mexico, Built During the Days of Maximilian," to decorate its calendar for 1920. The picture,

17 by 25 inches in size, is finely reproduced and an ornament to any office.

AN INTERESTING WALL MAP ISSUED BY THE RUBBER ASSOCIATION of America, Inc., shows at a glance the location of each industry that is represented by members of the Association. The spots are crowded thickly in Massachusetts, Connecticut, New Jersey and Ohio; they make a good showing, too, in Rhode Island, Pennsylvania and Indiana. There are fourteen west of the Mississippi and five in Canada.

"The Hex," A MONTHLY HOUSE-ORGAN CONSISTING OF EIGHT pages, 12 by 14½ inches, is being issued by The Black & Decker Manufacturing Co., Towson Heights, Baltimore. The name is derived from the trade-mark of the concern which represents a hexagonal seal bearing the company's name. Each issue contains news of interest from the several departments of the organization and is illustrated with photographs and sketches.

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

(796.) An inquiry has been received for the addresses of rubber manufacturers who make tubes which can be inflated and contracted vertically, each inside measurement of the container.

(797.) Inquiry is made as to the address of the present manufacturer of the Schirm dipping machine.

(798.) Request is made for standard inner tube specifications.

(799.) A subscriber asks where he can purchase pontianak resin.

(800.) An inquiry has been received as to where a sewing machine for stitching on tire shoes can be obtained.

(801.) A rubber manufacturer desires late information and formulas for making dipped and molded goods.

(802.) A request is made for the address of some rubber company that will make a few sample semi-solid rubber tires, the inquirer having his own mold.

(803.) Inquiry is made for the addresses of manufacturers of gutta percha tissue, for use by piano-player action manufacturers.

(804.) A reader asks information concerning "Azijnzuur," used for coagulating rubber on plantations.

(805.) A manufacturer requests information as to where he can obtain a machine for rolling finger cots.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Requests for each address should be on a separate sheet, and state number.

DISTRICT OFFICES.

New York: 734 Customhouse
Boston: 1801 Customhouse
Chicago: 504 Federal Building.
St. Louis: 402 Third National Bank Building.
New Orleans: 1020 Hibernia Bank Building.
San Francisco: 307 Customhouse.
Seattle: 848 Henry Building

COOPERATIVE OFFICES.

Cleveland: Chamber of Commerce.
Cincinnati: Chamber of Commerce; General Freight Agent, Southern Railway, 96 Ingalls Building.
Los Angeles: Chamber of Commerce.
Philadelphia: Chamber of Commerce.
Portland, Oregon: Chamber of Commerce
Dayton, Ohio: Dayton Chamber of Commerce

(File No. FE-114.) A firm in Singapore wishes to get in touch with American firms interested in rubber, gutta percha, jelutong and other products.

(34,401.) A company in Egypt wishes to buy tires and accessories. Quote f. o. b. New York. Payment in United States currency; confirmed credit in New York bank.

(34,402.) A merchant in Canada wants to secure a distributing agency for automobiles and tires. Quote f. o. b. Canadian destination. Payment cash.

(32,413.) A man in Algeria wishes to secure an agency for the sale of automobiles and tires. Quote c. i. f. Algeria. Payment against documents. Correspondence may be in English.

(32,437.) Several firms in Syria wish to be put in communication with manufacturers and exporters of rubber goods.

(32,458.) General importers and exporters in Syria desire to be placed in touch with manufacturers and exporters of rubber goods.

(32,473.) A firm of engineers and contractors in Siberia wishes to get in touch with manufacturers and exporters to secure agencies for rubber goods for industrial purposes. Correspondence may be in English.

(32,476.) Firms in Syria wish to enter into relations for the purchase of rubber goods.

(32,502.) A commercial firm in Turkey desires to secure an agency for the sale of rubber overshoes. Quotations c. i. f. Turkish port. Correspondence may be in English.

(32,561.) American representative of firms in China wishes to get in touch with exporters for the sale of rubber-plantation machinery.

JUDICIAL DECISIONS.

FACTS IN THE SCHRADER CASE.

THE CASE of A. Schrader's Son, Inc., maker of tire valves, charged with violation of the Sherman Anti-trust Act, has so far been a contest on legal technicalities and not on the merits of the case. The decision of the Supreme Court, at the beginning of April last, remands the case for trial to the District Court of the Northern District of Ohio. The Schrader company was indicted about the time that the Colgate soap company was put on trial for conspiracy under the Sherman Law. It was averred that in selling their tire valves, valve parts and other tire accessories to wholesalers, they themselves fixing the prices at which they should be sold and declaring that they would not sell to anyone who did not accept their terms, violated the law. The company demurred to the indictment but the District Court overruled this and the case came up again in September last, the Schrader company expecting to contest it on the facts in the case.

On June 2, 1919, however, the Supreme Court gave its decision on the Colgate case (United States Reports, Volume 250, page 301), Justice McReynolds reading the decision. District Judge Westenhaver thought the two cases were similar and had the Schrader case argued again on the demurrer. He stated in his decision that he believed the Supreme Court had held in the Colgate case that a manufacturer could choose his own customers and announce in advance that he would only deal with such as maintained his prices. The only difference he could see in the Schrader case was that the prices appeared in a written license agreement which was signed by the tire-makers and jobbers. He consequently allowed the demurrer and dismissed the indictment.

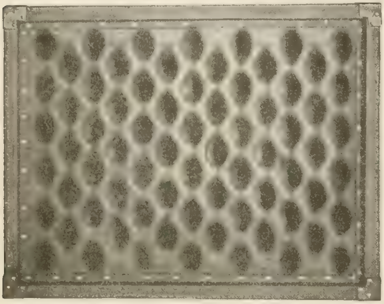
From Judge Westenhaven's decision the Government appealed to the Supreme Court which, on April 2, through Justice McReynolds, overruled the demurrer and sent the case back to the District Court to have the indictment tried. In the course of his decision, he intimated that there was a difference between the Schrader and the Colgate cases, and that the written agreement in the former's mode of business, constituted a violation of the law. That matter must be settled, however, in the trial which is to come.

RUBBER IMPORTERS LIMITED, to deal in crude rubber, has been incorporated in Singapore by the Rubber Importers & Dealers Co., Inc., New York City, which has had its own offices in Singapore for some time.

DIAMOND FIBER FOR RUBBER WORKING EQUIPMENT.

THE HARD, TOUGH, HOMOGENOUS MATERIAL with texture closely resembling horn, known as "fiber," is made from cotton cellulose, chemically hydrated. This product has remarkable properties and is being utilized by manufacturers everywhere in a great variety of products. Somewhat as in the case of rubber, new uses for it are daily being discovered.

Among rubber manufacturers fiber is being used for making such equipment as inner tube trays, bulb trays, books, boards, barrels, compound boxes and trucks. For all these purposes it is practically indestructible and for many other uses it is superior and less expensive than steel, brass, iron, tin, wood, vulcanite or leather. It is impervious to oil, grease or ordinary



STANDARD RUBBER BULB TRAY.

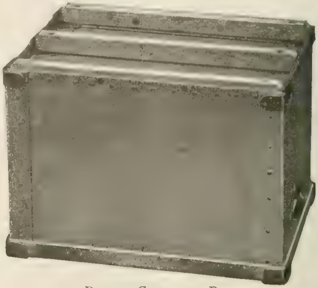
organic solvents, is unaffected by severe vibration, and may be worked into almost every conceivable form just as metals are machined. It cannot, however, be molded. Its tensile strength varies from 12,000 to 15,000 pounds per square inch and its resistance to compression, about 30,000 pounds per square inch. Its dielectric strength is approximately 200 volts per millimeter of thickness. The color incorporated in the material is permanent, the natural colors being gray, black and dark red, and the usual forms are sheets, rods and tubes, also special forms such as gears, bushings, washers, etc.

SHEET STOCK SEASONING BOOKS.

Fiber is especially adapted to use in rubber manufacturing because it eliminates all risk of damage to the uncured rubber by its freedom from splinters or roughness since fiber does not dent, split or crack and has a smooth, polished surface.

Another hydrolized cellulose fiber product of much interest to rubber manufacturers is that known as rubber parchmoid. This is a substitute for holland cloth at a cost of about 60 per cent less. It is strong and pliable with highly finished surface to which rubber will not adhere. It is water, air and oil proof and is especially suited as a wrapper for raw rubber.

The accompanying illustration shows a standard fiber bulb



RUBBER COMPOUND BOX.

tray in which impressions are made of the same shape as the uncured bulbs. A fiber angle frame is fastened around the bulb holder. This frame is made flat on top and bottom so that the frames can be stacked when not in use. Trays are usually made to hold 72 bulbs. Powdered soapstone is not necessary in using these trays.

Fiber seasoning books are made in dimensions as required. They are constructed with 1/16-inch fiber bottom. The wood frame is completely covered with fiber angles and reinforced with iron corner castings. There is a special construction for holding the leaves in place, and new leaves can be put in the book in less than three minutes. One type of book is specially designed for use in rubber footwear factories.

INNER TUBE SEASONING TRAY.

Fiber compound boxes are made extra strong to withstand hard usage in rubber mills. Fiber not less than .090 to .100-inch in thickness is used. The moldings are covered with metal and the corners protected with heavy steel castings. Snugly fitting joints prevent leakage or sifting of the contents and there are no projections to catch particles of the contents when the compound is dumped into the mixer. The boxes being slightly tapered can be nested when not in use; 24 by 18 by 12 inches is the standard size for compound boxes.

Inner tube trays have fiber bottoms with fiber angles securely riveted to the bottom. The flat, smooth heads of the rivets are on the inside of the tray. Two-inch hardwood molding covered with metal is used, with iron castings on the corners. These trays cannot splinter because there is no exposed wood and therefore the rubber tube is protected from puncture or injury. The usual dimensions of inner tube trays are 2 inches deep by 16 inches wide by 120 inches long.

THE DEPARTMENT OF AGRICULTURE ANNOUNCES THAT AFTER February 16, 1920, persons requesting the classification and certification of cotton, according to the Cotton Futures Act as amended by the Act of March 4, 1919, shall pay a fee of forty cents per bale.

Index to "Rubber Machinery" will be sent free upon request.

THE GUTTA PERCHA & RUBBER MFG. CO.

ESTABLISHED 1855

MANUFACTURERS OF

RUBBER BELTING, PACKING, HOSE, MATS, MATTING

AND

MECHANICAL RUBBER GOODS

OF EVERY KIND

Warerooms: Nos. 126-128 Duane St., NEW YORK

BRANCH STORES:

301 West Randolph St. CHICAGO	71 Pearl Street BOSTON	241 Chestnut Street PHILADELPHIA	34 Fremont Street SAN FRANCISCO

HENRY SPADONE, Pres. WALTER W. SPADONE, Vice-Pres. ALFRED A. SPADONE, Sec'y GEO. B. DICKERSON, Treas.

HOOD RUBBER CO.

MANUFACTURERS OF

Rubber Boots and Shoes

Rubber Sole Canvas Shoes

Tennis Shoes

Pneumatic Tires and Tubes

Solid Tires for Trucks

WATERTOWN, MASS.

64 YEARS

1856 TYRIAN TRADE MARK ESTABLISHED 1856 1920

Tyer Rubber Co., Inc.

Manufacturers of

DRUGGISTS' RUBBER GOODS

"TYRIAN"

Automobile Tires and Inner Tubes
Stationers' Rubber Bands

RUBBER MOLD WORK A SPECIALTY

ANDOVER, MASS., U. S. A.

H. A. ASTLETT & CO.

113-117 Pearl Street, New York

CABLE ADDRESS "ASTLETT," NEW YORK

CRUDE
WASHED & REFINED
RUBBER

Annual Report of the United States Rubber Co.

The twenty-eighth annual report of the United States Rubber Co., presented at the annual meeting April, 20, 1920, showed a gratifying business for the calendar year 1919. Net sales amounted to $225,589,465, an increase of almost $10,000,000 over 1918, the latter year including a large volume of business incident to the war. The net income before interest, but after providing for depreciation of plants and adequate reserves for Federal, Canadian and British taxes on income and profits, amounted to $21,396,099. Deducting $3,665,862 for interest charges leaves a net profit of $17,730,237. From this there remained to be deducted $5,041,476 for dividends on preferred stock, $19,567 for dividends on minority stock of subsidiaries, $720,000 for dividend on common stock paid October 31, 1919, and $1,378,576 for reserve for dividend on common stock payable January 31, 1920, leaving a balance for the year of $10,570,618 to be carried to surplus account. The surplus at the beginning of the year amounted to $41,848,051, from which $108,506 was deducted for adjustments made during the year, making the surplus as of December 31, 1919, $52,310,163.

The financial condition of the company, according to Chairman Colt, "was never better than it is to-day." Expanding business and advancing costs will in time require more capital. Sales so far this year "show a substantial increase over last year," and with the completion of new plant facilities, notably in the tire division, sales and profits, he believes, should be larger for 1920 than they were in 1919.

THE CHAIRMAN'S REPORT.

To the Stockholders of the United States Rubber Co.:

In compliance with the by-laws of the company, the chairman of the board of directors submits to the stockholders this annual report for the fiscal year ended December 31, 1919.

The financial statement, as compiled by the comptroller and certified by the public accountants, is appended hereto and made a part hereof. This statement gives a consolidated general balance sheet as of December 31, 1919, of the United States Rubber Co. and its subsidiaries, after excluding all offsetting accounts between the companies.

VOLUME OF BUSINESS AND PROFITS.

The net sales of the company for the year 1919 were $225,589,465, an increase of more than $10,000,000 over the sales of the previous year, which latter included a large volume of business incident to the war. This war business in 1918 was $25,000,000 greater than in 1919.

The net income before interest, but after making provision for depreciation of plants and adequate reserves for Federal, Canadian and British taxes on income and profits, amounted to		$21,396,099
The net interest charges amounted to		3,665,862
Thus leaving net profits for the year		$17,730,237
The dividends on United States Rubber Co. preferred stocks amounted to	$5,041,476	
The dividends on minority stock of subsidiary companies amounted to	19,567	
Making a total of		5,061,043
Leaving surplus for the year applicable to the common stock		$12,669,194
From which there was deducted:		
Dividend on common stock paid October 31, 1919	$720,000	
Reserve for dividend on common stock payable January 31, 1920	1,378,576	
Making a total for common stock dividends		2,098,576
Leaving balance for the year carried to surplus account		$10,570,618
The surplus at the beginning of the year amounted to	$41,848,051	
From which there was deducted for adjustments made during the year	108,506	
Thus leaving		$41,739,545
Making the surplus as of December 31, 1919		$52,310,163

AMENDMENT OF CHARTER.

At a special meeting of our stockholders held September 9, 1919, it was voted to increase the authorized first preferred stock from $70,000,000 to $100,000,000 and the authorized common stock from $40,000,000 to $200,000,000, and to retire the small remaining balance of second preferred stock, thus simplifying the capitalization of the company and providing the opportunity for future financing through the issuance of common stock when the same seems desirable.

INCREASE IN THE COMMON STOCK.

Pursuant to such action of the stockholders, an offering of our common stock of 100 per cent, or $36,000,000, was made at par, pro rata, to our common stockholders of record September 13, 1919, subscriptions being payable October 1, 1919, or in four instalments, at the election of the stockholder. All of the stock so offered was subscribed for by the stockholders, a very large percentage of stockholders electing to pay in full on October 1, and the company received, as of that date, $33,683,450, and the balance of $2,316,550 was thereafter paid in instalments as provided. The company, however, had the use of this money for but three months of the year, and a considerable amount was held to liquidate short time maturing obligations.

STOCK CARRIED FOR EMPLOYES.

With a view to increasing the zeal and efficiency of the employes of the company, by encouraging them to have direct personal interest in its success, your directors have from time to time provided through a "Stock Subscription and Profit Sharing Plan," a "Value Sharing Plan," and options on stock in certain special cases, for such employes to acquire such stock by carrying it for them for certain periods, over 4,500 employes being included this year in such plans. Your chairman cannot but feel that the enthusiasm and earnestness which such personal interest has engendered has had much to do with the unusual growth of our business and profits.

When the common stock was doubled in amount, the company through a subsidiary acquired and agreed to carry for not exceeding five years the additional amounts to which such employes were entitled to subscribe with respect to stock received by them or carried for them under such plans.

DIVIDENDS UPON COMMON STOCK.

In October, 1919, your directors placed our common stock upon an 8 per cent dividend basis, believing that they were amply warranted in so doing, and the earnings of the year together with the future outlook of business, would indicate that such action was conservative.

On January 8, 1920, the board of directors voted to distribute $9,000,000 of the surplus of the company, as a stock dividend of 12½ per cent, to common stockholders of record February 5, 1920.

It will be noted that the surplus of the year 1919 itself was sufficient to cover this stock dividend as well as the cash dividends paid.

INVENTORIES.

Inventories of manufactured goods and materials have been taken at cost where cost was below market, and at market where the market was below cost. The market today is generally above cost.

MAINTENANCE OF PLANTS.

The plants and properties of the company have been maintained as heretofore in the highest state of efficiency, and adequate reserves have been made for possible depreciation by charges against current earnings.

EXPANSION OF PLANTS.

In order to provide for the constant and rapidly increasing demand for its product of automobile truck and passenger car tires, the company commenced in the early part of 1919 a substantial expansion of its tire manufacturing plants both in the United States and in Canada. This expansion includes important developments at each of the company's five tire plants, and it is confidently expected that these improvements will more than double the productive capacity of the tire plants by the early part of next year.

All expansions and improvements have been made with a view to effecting every economy in manufacture and at the same time to maintaining the highest possible quality of the product.

SINKING FUND FOR RETIREMENT OF BONDS.

Pursuant to the requirements of the indenture securing the company's first and refunding mortgage 5 per cent gold bonds,

$690,000, being 1 per cent of the total amount of bonds issued, was paid to the sinking fund trustees on January 1, 1919.

The call for tenders resulted in the purchase of bonds to the par value of $793,000, and these bonds have been retired and the bonded indebtedness reduced by a like amount.

UNITED STATES RUBBER EXPORT CO., LIMITED.

The export sales of the company have increased over the previous year.

Adverse exchange conditions prevailing in some of our foreign markets were successfully met and a satisfactory profit maintained.

Your directors, realizing the value of export markets as a stabilizing factor and the importance of such an outlet, are continuing the policy referred to in the last annual report of maintaining and materially extending our export business.

GENERAL RUBBER CO.

Since 1904 this subsidiary has protected our requirements (now including our Canadian company) of crude rubber in a most satisfactory manner. On January 1, 1920, the name of their London branch, William Symington & Co., Limited, was changed to "General Rubber Co., Ltd." The General Rubber Co. now directly or through its subsidiaries entirely owns and operates our houses at London, Liverpool, Singapore, Colombo. Pará and Manáos. This efficient organization has been recognized by others to such an extent that outside dealers and manufacturers are entrusting to it a large portion of their orders.

RUBBER PLANTATIONS.

During the year 1919 the production of our plantations in Sumatra has shown a good increase over previous years due largely to the growth of the trees. It is our intention to continue the extension policy as rapidly as possible in order that eventually a much larger percentage of the rubber consumed by our factories may be obtained from our own plantations, and in connection with this it should be borne in mind that our consumption of crude rubber greatly increases from year to year. In this extension program, the company is not confining itself to Sumatra, which is under the government of Holland, but planted properties and areas suitable for planting already have been acquired in other territories, principally on the Malay Peninsula, which is under the British Government.

As stated in my report for 1918, the management of the present properties and the new areas being acquired and developed are under the direct control of the United States Rubber Plantations, Incorporated, the subsidiaries of which at December 31, 1919, were the Holland American Plantage Maatschappij, Si Pare Pare Rubber Maatschappij and Nederland Langkat Rubber Maatschappij, which together own over 90,000 acres in Sumatra, the planted area of which is over four times the size of any other American owned plantation and is the largest unit of rubber planted area in the world.

OUTLOOK FOR 1920.

The sales of the company so far this year show a substantial increase over last year. With the completion of our new construction now in process, notably in the tire division, our sales and profits for 1920 should be larger than they were in 1919.

GENERAL FINANCIAL CONDITION.

The financial condition of the company was never better than it is to-day. However, its expanding business, outlays for new construction to meet the same, and also the advancing cost of practically all materials entering into our manufactured product (with the one exception of crude rubber), will in time require more working capital.

FINAL.

I am pleased to make mention of the continued fidelity and ability shown by the officers, heads of departments, our Far Eastern and foreign staffs, and other employes of the company and its subsidiaries.

Respectfully submitted,
Samuel P. Colt, Chairman.

THE COMPTROLLER'S REPORT.

UNITED STATES RUBBER CO. AND SUBSIDIARY COMPANIES.

Consolidated General Balance Sheet, December 31, 1919.

ASSETS.

Cash	$20,037,646.20
Accounts receivable	40,770,427.90
Notes and loans receivable	1,377,339.05
United States Liberty Bonds and Victory Notes and Canadian Victory Bonds	3,479,902.15
Notes receivable of employes given for purchase of capital stock, secured by such stock to the par value of $9,709,900	8,576,043.41
Manufactured goods and material	87,633,699.00
Total current assets	$161,875,057.71
Securities owned and held in the insurance fund	2,331,778.75
Securities owned, including stock of United States Rubber Co. held by subsidiary companies	5,522,317.19
Plants, properties and investments, including rubber plantations	148,610,520.27
Prepaid and deferred assets	1,194,530.09
Total assets	$319,534,204.01

LIABILITIES, RESERVES AND CAPITAL.

Accounts payable and accrued liabilities		$22,902,570.50	
Acceptances payable for importation of crude rubber		1,430,148.20	
Notes and loans payable		0.00	
Total current liabilities			$24,332,718.70
United States Rubber Co. first and refunding mortgage 5 per cent gold bonds, due 1947	$68,207,000,000		
Less treasury bonds, deposited as security for United States Rubber Co. 5-year 7 per cent secured gold notes, due December 1, 1923	9,000,000,000		
		$59,207,000.00	
United States Rubber Co. 5-year 7 per cent secured gold notes, due December 1, 1923		6,000,000.00	
Canadian Consolidated Rubber Co., Limited, 6 per cent gold bonds, due 1946		2,600,000.00	
			67,807,000.00
Total liabilities			$92,139,718.70
General reserves		$13,021,666.29	
Insurance fund reserve	$1,825,138.51		
Employes accident fund reserve	776,370.21		
		2,601,508.72	
Reserve for depreciation of property and plants		14,812,254.16	
Reserve for dividend on preferred stock, payable January 31, 1920		1,260,442.00	
Reserve for dividend on common stock, payable January 31, 1920		1,378,576.00	
Total reserves			33,074,447.17
Capital stock—First preferred	$63,022,100.00		
Capital stock—Common	72,000,000.00		
Minority—Canadian Consolidated Rubber Co., Limited, stock	278,500.00		
Total capital stock		$135,300,600.00	
Fixed surpluses—subsidiary companies	$6,709,275.00		
Surplus	52,310,162.92		
		59,019,438.14	
Total capital stock and surpluses			194,320,038.14
Total			$319,534,204.01

Respectfully submitted,
W. G. Parsons, Comptroller.

MANAGEMENT.

The management of the business is in the following competent hands:

OFFICERS.

Samuel P. Colt, chairman; Lester Leland, vice-chairman; Charles B. Seger, president; James B. Ford, vice-president; Homer E. Sawyer, vice-president in charge of footwear division; Elisha S. Williams, vice-president in charge of mechanical goods division; Ernest Hopkinson, vice-president in charge of development department; J. Newton Gunn, president of United States Tire Co. in charge of tire division; Samuel Norris, secretary; W. G. Parsons, vice-president and comptroller; H. B. Hubbard and William O. Cutter, assistant comptrollers; W. H. Blackwell, treasurer; John D. Carberry, assistant secretary and assistant treasurer; Sherwood S. Green, assistant treasurer; George E. Smith, auditor.

DIRECTORS.

James S. Alexander, Walter S. Ballou, James C. Brady, Nicholas F. Brady, Middleton S. Burrill, Samuel P. Colt, Harry E. Converse, Sir Mortimer B. Davis, James Deshler, James B. Ford, James Newton Gunn, Francis L. Hine, Ernest Hopkinson, Henry L. Hotchkiss, Lester Leland, Nathaniel Meyers, Samuel M. Nicholson, Raymond B. Price, Homer E. Sawyer, Charles B. Seger, William H. Truesdale, Theodore N. Vail, Frank A. Vanderlip, Elisha S. Williams.

EXECUTIVE COMMITTEE.

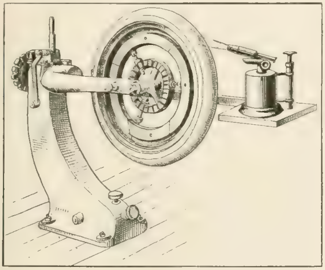
Samuel P. Colt, Lester Leland, Charles B. Seger, James B. Ford, Walter S. Ballou, Nicholas F. Brady.

THE BUNSEN BURNER IN RUBBER REPAIR.

By Arthur C. Squires

Every rubber man knows that melting rubber spoils it, whether the rubber is vulcanized or not, but, like many other rules conserving rubber, there are exceptions. A well-known case in point is the sticking of the iron shafts into rubber wringer rolls. This has been done successfully for years by heating the shaft red hot and forcing it through the rubber roll. The hot iron melts the rubber that it comes in contact with and forms a tenacious film that is tremendously adhesive. Indeed, it is one of the strongest bindings known.

Along the same line is the melting of a vulcanized rubber surface for patching. This has also been done with a hot iron, but



Preparing a Tire for Retreading by the Blue-Flame Process.

a better way is to use a controlled blue flame; for this the Bunsen burner or blow-torch is ideal. A quick searing of a rubber surface—being careful not to scorch the fabric—effects a semi-devulcanization of the rubber surface and melts some of the rubber. A patch cemented on this never lets go. Hot water bottles, which are most difficult of repair, respond to this method better than to any other. So, too, inner tubes are exceedingly well mended by the blue-flame method. The applicability of it to auto tires has also quite lately been thoroughly demonstrated. Even auto tires which have been worn down nearly to the fabric of the carcass are being successfully semi-devulcanized and retreaded by this new method.

It is not necessary to file, roughen or clean the worn parts of a tire, as has been customary. The blue flame removes all foreign matter, sulphur bloom, and moisture, leaving a clean, sticky surface. This is covered with a solution consisting of 5 per cent pure rubber dissolved in 95 per cent of carbon tetrachloride or benzol and given time to dry.

A new tread is best constructed by applying 2-inch-wide strips of unvulcanized tread stock to the sticky tread surface and stitching the strip smooth and fast all around the face of the tire. The new tread is formed of strips of semi-devulcanized stock cut to the desired width and thickness of the tread, superposed and stuck fast on the unvulcanized strip. Next a strip of unvulcanized tread stock cut wide enough to cover and overlap the built up tread completely around the circumference of the tire completes the assembly that is now ready to be cured in a sectional vulcanizer or retreading mold.

A complete new tread built on a tire 4½ by 35 inches requires 2½ pounds of new unvulcanized stock and 7½ pounds of vulcanized tire strippings. The weight of the retread stock used in retreading a tire should be known. This fact can be ascertained by vulcanizing a foot length of standard retreading stock in the mold free from contact with the tire.

The semi-vulcanized stock mentioned is thus prepared. Tread strippings from worn tires are cut to the proper width and the surface treated with the flame of the burner. The vulcanized rubber is semi-devulcanized and its surface rendered very sticky. After it is applied as a new tread and vulcanized it forms a very tenacious and durable stock at a small cost.

ALUMINUM IN THE RUBBER INDUSTRY.

Steel and iron mandrels, molds and cores have been and still are very generally used in many branches of the rubber industry. Similarly maple forms or lasts have been the rule in the manufacture of rubber boots and overshoes. Steel, iron and wood leave much to be desired in the way of adaptability, though from differing causes.

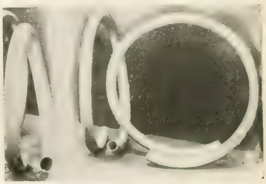
Mandrels, molds and cores are not only heavy to handle, but used in connection with the process of vulcanization are more or less seriously subjected to rusting and pitting, thus transferring rough and discolored surfaces to the rubber cured in contact with these defects.

Boot trees and lasts for large overshoes where made of maple wood are subject to deterioration by the heat of vulcanization and undergo a slow carbonization with the result that when continuously handled, as they are, the sharp angles wear away rapidly, thus changing the form and fit of the goods made upon them.

These defects have been very completely removed by the introduction of aluminum alloy to replace steel, iron and wood, particularly for the places indicated. A few facts with regard to aluminum will be of interest in this connection.

INNER TUBE MANDRELS AND CORES.

In the first place sulphur has no effect on it at all; further, it is light, having little more than one-third the weight of iron. This is important for the men who handle the mandrels. A two-inch aluminum tube ten gage and ten feet long will weigh about nine pounds, while the same mandrel in iron will weigh twenty - six. This makes considerable difference in the speed with which the mandrel can be handled. The illustration shows a couple of tube mandrels used in an English tire factory and in accordance with their usual practice they are curved to the form of the tire. Still it is found that the rubber tube is quite easily peeled off.



Aluminum Mandrels

Aluminum cores are also used for outer covers, but in the shape of a closed circle the joint in the metal being carefully welded. Tube mandrels are, of course, made of smaller tube in straight lengths, but whereas a steel one will weigh a hundred pounds the same apparatus in aluminum will only weigh thirty.

LABELS FOR BRANDING HOSE, TIRES, ETC.

Aluminum can be rolled very thin, in fact, nearly as thin as gold, and there is a great demand for strip about ten one-thousandths of an inch thick for brands. When a pattern or lettering has to be stamped on a rubber hose or tire it is, of course, necessary to interpose a thin strip of metal bearing the lettering or design to be impressed in the rubber. Some rubber manufacturers use tin for this purpose, but tin is more than three times as heavy, and although it costs more to the pound, aluminum is at least seventy-five per cent cheaper, because of the greater area due to its lesser gravity.

ALUMINUM TIRES AND LASTS.

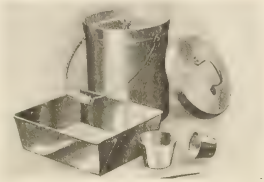
Rubber boots and overshoes are now made on aluminum lasts of a special alloy devised by a British company for this purpose. This metal pours freely into the mold, and is strong and easily

polished. The same metal can be applied to make the various molds used for other purposes in the rubber trade, etc.

The cast metal withstands heavy pressures employed in molding and as it polishes perfectly imparts a lustrous finish to the molded goods.

ALUMINUM ON THE RUBBER PLANTATION.

In the gathering and preparation of rubber latex a great variety of utensils is necessary. It is here that aluminum has found ready adaptability for its lightness and resistance to corrosion. Latex cups and spouts, collecting pails and coagulating pans, are a few of the aluminum accessories in daily use on a rubber plantation.



Aluminum Latex Utensils.

EMERGENCY REPAIRS ON BALLOONS.

When an Army balloon in use is ripped, the soldier aeronauts do not nowadays exhaust the big rubberized silk bag of its gas in order to mend the rent. They have found that by swift, well-directed work such damage can be corrected readily on a filled balloon, and with a minimum loss of gas and time. As soon as the balloon breaks or is torn by contact with a tree, pole, chimney or other object, a hurry call is given and soon a crowd of soldiers surround and seize the big gas bag. By tugging at the ropes holding the basket they maneuver the balloon until the gaping part is turned underneath. The object of this is to save the hydrogen; for with the ripped side up the lighter-than-air gas soon escapes. Even when the torn part is below, there is much leakage, and, what is also objectionable, there is an admission of air, which if allowed to continue far, lessens the buoyancy and often necessitates refilling.

Repairing Balloon, Ross Field, California.

While the gas bag is thus held captive the repairers pull the torn flaps together and hold them while others sew the torn section with a baseball stitch of stout linen thread. At the same time others prepare the cement of pure Pará rubber dissolved in naphtha, while others cut a patch of balloon material slightly larger than the torn part. The cement having been brushed on the patch and torn surface, the patch is applied and rolled down thoroughly with a hand roller. In a few minutes it is dry and the balloon ready for use again.

A disadvantage of the emergency repair is, that a patch can be put on one side (the outer) only, and the rolling has to be done against a yielding, cushion-like surface; although very good results are obtained by the resistance afforded by the distended bag, which is ordinarily inflated with about 18 pounds' pressure.

When time can be taken for a job the balloon is turned inside out and laid flat. Then a patch is applied on each side of the stitched part, the rolling is done against a hard, smooth surface, and the result is a bag that for all practical purposes is as good as new. The cement used in the slower and more thorough operation is the same as used in the hasty repair work.

PNEUMATIC TIRES FOR PACKARD TRUCKS.

A new line of pneumatic-tired trucks has been put on the market by the Packard Motor Car Co. of Detroit, in order to meet the demand for greater speed and wider expansion of transportation by motor trucks. The necessary gear ratios and machinery details have been carefully studied out. Demountable rim equipment is provided so as to make it easier to handle the giant size tires. The use of metal wheels of the spoke type renders it possible to employ a slot in the rim for the valve stem and thus enable the tire to be assembled on the wheel by rolling it into position and then sliding it over the wheel, instead of lifting tire and rim assembly so as to insert the valve stem through a hole in the rim, as is the practice with small, light tires.

The trucks are made in 1½-ton, 2-ton and 3-ton sizes, full details of each being given in the company's circular. The sizes of tires, all single pneumatic, are, for the 1½-ton trucks—front 36 by 6, rear 38 by 7; for the 2-ton trucks—front 36 by 6, rear 40 by 8; for the 3-ton trucks—front 38 by 7, rear 44 by 10. Just four sizes of tires are used.

FIFTY MILLION SMALL TIRES?

"The smallest automobile in earth" as far as we know is shown in the above picture. This little car was built by Fritz Reuter, of San Antonio, Texas, who operates a large automobile machine shop. He built the car of odds and ends from Fords to Pierce-Arrows.

This clever little piece of handiwork is run by electric motor and storage battery and is the result of one and one-half years of work during spare moments. The figure on the back of the car is a statuette of the widely known "Time to Re-tire" boy of The Fisk Rubber Co.

The Smallest Automobile.

Ten million six-year-olds equipped with these Lilliputian cars would use 50,000,000 tires. Added to what the grown-ups require it means a rubber shortage by 1925.

News of the American Rubber Industry.

FINANCIAL NOTES.

The B. F. Goodrich Co. has issued $30,000,000 in four-year seven per cent convertible gold notes, due April 1, 1925, that at 98¼ and accrued interest will yield more than 7.40 per cent. These notes carry detachable warrants giving holders a call on common stock at $80 a share.

The Fisk Rubber Co. for the year ended Dec. 31, 1919, shows surplus after federal taxes of $3,994,657, equivalent after preferred dividends to $5.99 a share ($25 par) against $2,506,853 or $19.50 ($100 par) earned on $8,000,000 common stock in 1918. Net sales in 1919 were $43,613,975. Income account compares:

	1919.	1918.	1917.
Net profits	$4,956,685	$3,760,279	$3,578,484
Federal taxes	962,028	1,253,426	549,913
Balance	3,994,657	2,506,853	3,028,572
Preferred dividends	1,055,489	946,750	972,850
Deduction	*835,049	*589,659	475,685
Surplus	2,104,118	970,444	1,580,037

*Retirement preferred stock.

Stockholders of the Hood Rubber Co. voted to increase the authorized common stock of the company from $3,500,000 (of which $3,000,000 is outstanding) to $5,500,000. The $2,000,000 additional stock will be distributed as a stock dividend, to common stockholders of record April 10, in proportion of two new shares for every three shares now owned.

The Miller Rubber Co.'s sales for March, 1920, totalled $3,600,000, according to the company's report. Total sales for 1919 were $26,476,211, an increase of nearly $11,000,000 over the previous year. At the present rate the sales total for 1920 will be $50,000,000. Capitalization of the company was recently increased to $60,000,000 to care for an oversold condition.

DIVIDENDS.

The American Zinc, Lead & Smelting Co., St. Louis, Missouri, and New York City, has declared a dividend of $1.50 per share, payable May 1 on preferred stock of record April 15, 1920.

The Ames Holden McCready System, Montreal, Quebec. declared a quarterly dividend of one and three-quarters per cent, payable April 2 on preferred stock of record March 19, 1920.

The Canadian-Connecticut Cotton Mills, Limited, New York City and Sherbrooke, Quebec, Canada, recently declared a two per cent quarterly dividend, payable April 1 on preferred stock of record March 20, 1920.

The Canadian General Electric Co., Limited, Toronto, Ontario, declared the following dividends: two per cent quarterly on common stock, two per cent extra, and three and one-half per cent semi-annual on preferred stock, all payable April 1 on stock of record March 13, 1920.

The Corn Products Refining Co., New York City, declared the following dividends: one per cent quarterly and one-half of one per cent extra, both on common stock, and one and three-quarters per cent quarterly on preferred stock, all payable April 20 on stock of record April 5, 1920.

The Dayton Rubber Manufacturing Co., Dayton, Ohio, declared a quarterly dividend of $1.75 per share, payable April 1 on preferred stock of record March 20, 1920.

E. I. du Pont de Nemours & Co. (incorporated), Wilmington, Delaware, declared a quarterly dividend of one and one-half per cent, payable April 26 on stock of record April 10, 1920.

The First National Bank, Boston, Massachusetts, declared a quarterly dividend of four per cent and an extra dividend of one per cent, both payable April 1 on stock of record March 24.

The Globe Rubber Tire Manufacturing Co., Trenton, New Jersey, declared its regular quarterly dividend of one and one-half per cent and a stock dividend of ten per cent, both payable April 1, 1920.

The B. F. Goodrich Co., Akron, Ohio, has declared its regular quarterly dividend of $1.50 per share, payable August 16 on common stock of record August 5, 1920.

The Goudey Gum Co., Boston, Massachusetts, declared a quarterly dividend of $2 per share, payable April 1 on preferred stock of record March 27, 1920.

The Hood Rubber Co., Watertown, Massachusetts, has declared its regular quarterly dividend of one and three-quarters per cent, payable May 1 on preferred stock of record April 21, 1920.

The Kelly-Springfield Tire Co., New York City, has declared the following dividends: quarterly, cash $1 per share and stock three per cent, payable May 1 on common stock of record April 17; quarterly, $2 per share, payable May 15 on eight per cent preferred stock of record May 1, 1920.

The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio, has declared its regular quarterly dividend of one and three-quarters per cent on outstanding preferred stock.

The Monatiquot Rubber Works Co., South Braintree, Massachusetts, declared a quarterly dividend of $1.75 per share, payable April 1 on preferred stock of record March 23, 1920.

The Mutual Tire & Rubber Corporation, New York City, declared an initial dividend of one per cent, payable April 19 on stock of record March 27, 1920.

The Standard Tire Co., Willoughby, Ohio, recently declared initial quarterly dividends of one and three-quarters per cent on preferred stock and of one and one-half per cent on common stock payable April 1 on stock of record March 25, 1920.

The Sterling Tire Corporation, Rutherford, New Jersey, has declared the following dividends: one per cent annual on common stock, eight per cent on eight per cent preferred stock, series B, and one and three-quarters per cent quarterly on seven per cent preferred stock, all payable April 15 on stock of record April 1, 1920.

The Tyer Rubber Co., Andover, Massachusetts, has declared its regular quarterly dividend of $1.50 per share, payable May 15, 1920, on preferred stock.

The United States Rubber Co., New York City, has declared quarterly dividends of two per cent on both common and preferred stock, payable April 30 on stock of record April 15, 1920.

The Winnsboro Mills, Winnsboro, South Carolina, declared a quarterly dividend of two per cent, payable April 1 on stock of record March 26, 1920.

The Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, declared quarterly dividends of two per cent on its common and preferred stock, payable April 30 and April 15, respectively, on stock of record April 2, 1920.

LIBERTY BONDS A BETTER INVESTMENT THAN EVER.

Thrifty rubber workers are finding the present favorable market prices of Liberty Bonds a very profitable investment for their savings, and some of the large rubber companies are encouraging and assisting their operatives in the purchase of these securities. Owing to the great demand for $50 and $100

bonds the Treasury Department has issued instructions to the Federal Reserve Banks which will expedite the exchange of bonds of larger denominations for the small units. Ways and means are also provided whereby the smaller bonds may be obtained in the first instance.

NEW INCORPORATIONS.

Artcraft Tire Co., The, September 16, 1919 (Iowa), $1,000,000. A. Smith, president; L. C. Merritt, vice-president; B. J. Kraft, secretary and treasurer. Principal office, Des Moines, Iowa. To manufacture, sell and deal in rubber goods.

Baldwin Tire Co., March 31, 1920 (New Jersey), $100,000. H. M. Smith; K. M. Baldwin, both of 654 Clinton avenue; J. M. Baldwin, 27 Frelinghuysen avenue—both of Newark, New Jersey. Principal office, 27 Frelinghuysen avenue, Newark, New Jersey. Agent in charge, J. M. Baldwin. To manufacture, import, export, and buy automobile tires, supplies, etc.

Block Tire & Rubber Co., February 21, 1920 (Indiana), $1,500,000. G. R. Wilson, president and treasurer; L. C. Zebring, vice-president; E. N. Ely, secretary. Principal office, Lafayette, Indiana. To manufacture automobile tires and rubber goods.

Burlock Rubber Clothing Co., The, January 19, 1920 (Wisconsin), $250,000. C. Burlock, president; F. E. Foster, secretary, both of 297 Third street, Milwaukee; J. Sell, vice-president, 1012 Washington street; E. J. Fitzgerald, 313 Third street, both of Wausau, both in Wisconsin. Principal office, Wausau, Wisconsin. To manufacture, buy, sell, export, import and generally deal and trade in leather, rubber and gutta percha.

C. L. Tire Shop, Inc., April 20, 1920 (New York), $35,000. J. B. and D. L. Cothran, both of 125 Hamilton avenue, New Rochelle; C. G. Loew, Poughkeepsie, both in New York. Principal office, Poughkeepsie, New York. To manufacture auto tires.

Doyle Tire & Rubber Co., The, October 21, 1919 (Ohio), $300,000. D. A. Doyle, Jr., president and treasurer; M. J. Soply, vice-president and sales manager; F. H. Kelsey, vice-president; A. W. Doyle, secretary. Principal office, Doyle Block, Akron, Ohio. To manufacture cord and fabric tires.

Enterprise Vulcanizing Co., Inc., April 16, 1920 (New York), $10,000. A. and M. Herman, both of 205 Frost street; C. H. Paulsen, 402 Dean street—both in Brooklyn, New York. To do tire repair business, etc.

Everybody's Garter Co., Inc., April 20, 1920 (New York), $10,000. A. Landau, 836 Broadway, New York City; C. Weintraub, 995 Eastern Parkway, Brooklyn; M. Landau, Floral Park, Long Island—all in New York. Principal office, Floral Park, New York. To manufacture suspenders, garters, etc.

Ford Tire & Rubber Co., April 5, 1920 (Delaware), $3,000,000. F. R. Hansell; J. V. Pimm; E. M. MacFarland—all of Philadelphia, Pa. To manufacture tires.

Gillette Rubber Products Co., The, March 18, 1920 (West Virginia), $600,000. D. L. McConaughy; A. M. Replogle; S. Patterson, all of 928 Frick Building; C. O. Lind, 289 Union Arcade—both in Pittsburgh, Pennsylvania; T. S. Wilson, 19th and Prospect streets, Cleveland, Ohio. Principal office, Cleveland, Ohio. To manufacture automobile tires and other rubber products.

Gutta Percha Products Co., Inc., April 13, 1920 (New York), $20,000. K. F. Wallin, 1512 Pacific street; B. McMillan, 15 Aberdeen street, both of Brooklyn; J. J. Brawley, 1029 Ogden avenue, New York City—both in New York. To manufacture and deal in rubber, gutta percha, etc.

Habirshaw Electric Cable Co., February 28, 1920 (Delaware), authorized capital $1,350,000 preferred; 300,000 shares common, no par value. Principal office, 10 East 43rd street, New York City. Delaware agent, The Capital Trust Co. of Delaware. J. N. Shreve, president and treasurer; G. F. Waterbury, vice-president; J. S. Keith, secretary. To manufacture and sell insulated wires and cables and to hold stock of corporations engaged in a similar line of business.

Hennessy-Fennell Tire Co., November 15, 1919 (Iowa), $10,000. F. D. Hennessy, president and treasurer; E. A. Brown, vice-president; T. P. Fennell, secretary. Principal office, southwest corner Eighth and Nebraska streets, Sioux City, Iowa. To rebuild and repair tires.

Imperial Rubber Co., The, March 27, 1920 (Ohio), $25,000. F. T. Flinn, president, Ashland; S. S. Hobbs, vice-president, Oberlin; H. A. Flinn, secretary and treasurer; H. H. Hoberg, general manager; F. L. Strauss, the latter three of Orrville; all in Ohio. Principal office, Orrville, Ohio. To manufacture rubber sundries and specialties.

Industrial Rubber Corp., April 9, 1920 (New York), $100,000. L. Price, 894 Riverside Drive; N. Bolden, 305 West 148th street; E. L. Alexander, 385 Central Park West—all of New York City. Principal office, Long Island City, New York. To manufacture rubber products.

Jackson Tire & Rubber Co., April 5, 1920 (Delaware), $7,925,000. T. L. Croteau; M. A. Bruce; S. E. Dill—all of Wilmington, Delaware.

Kentucky Tire Pump Co., October 11, 1919 (Kentucky), $50,000. W. J. Ruby; H. H. Coal; F. P. Taylor—all of Madisonville, Kentucky. Principal office, Madisonville, Kentucky. To manufacture automobile accessories.

Knickerbocker Rubber Co., Inc., April 13, 1920 (New York), $25,000. Walter B. and Thomas B. McDonald, both of 646 56th street; T. A. McNamara, 410 Sixth street, both in Brooklyn, New York. To manufacture rubber tires, etc.

Lewen Patents, Inc., April 12, 1920 (New York), $500. M. H. Behr, 123 East 57th street; H. L. Lewen, 528 West 30th street, both of New York City; W. J. Boller, 318 Lincoln avenue, Rockville Centre, Long Island; both in New York. To deal in patents, tires, etc.

MacArthur & White, Inc., March 26, 1920 (New York), $5,000. W. MacArthur; A. R. White, both of Akron, Ohio; A. Paegelow, 2653 Decatur avenue, Fordham, New York City. To manufacture rubber goods.

National Steam & Stencil Works, Inc., April 7, 1920 (New York), $5,000. R. Count; C. Essinger, both of 472 Bainbridge street, Brooklyn; J. Engel, 1702 Woodbine street, Ridgewood—both in New York. To manufacture rubber stamps, stencils, checks, etc.

New York Tire Stores Corp., March 29, 1920 (New York), $250,000. S. and A. Jaffe, 2126 Vyse avenue; J. Tiler, 3 West 111th street, both in New York City. To do tire business.

Orester Tire Co., Inc., April 3, 1920 (New York), $95,000. J. Orester, G. E. Scherer, C. J. Parker—all of Syracuse, New York. Principal office, Syracuse, New York. To conduct a tire business.

Rubber-Crêpe Manufacturing Co., Inc., April 2, 1920 (New York), $100,000. W. W. Lesselbaum, F. Druss, E. Eisenstein—all of 128 Broadway, New York City. Principal office, Queens, New York City. To manufacture rubber goods.

Scott Rubber Co., Inc., April 2, 1920 (New York), $125,000. G. L. Kerr, 790 Riverside Drive; W. H. Palen, 18 East 28th street, both in New York City; H. B. E. Scott, 26 Cottage street, Poughkeepsie—both in New York. Principal office, Poughkeepsie, New York. To manufacture rubber goods, etc.

Sewell Cushion Wheel Co., April 5, 1920 (Delaware), $1,000,000. T. L. Croteau, M. A. Bruce, S. E. Dill—all of Wilmington, Delaware. Head office, Detroit, Michigan.

Smith Rubber & Tire Co., April 14, 1920 (New York), $50,000. E. B. McCaffrey; R. L. Gray; I. M. Jacobson—all of 1777 Broadway, New York City.

Synthetic Leather & Waterproofing Co., March 29, 1920 (Delaware), $1,000,000. T. L. Croteau, M. A. Bruce, S. E. Dill—all of Wilmington, Delaware. To manufacture leather, imitation leather, belting, etc.

Tirometer Valve Corporation of America, September 30, 1919 (West Virginia), $250,000. J. Collins, president; G. P. Daniels, first vice-president; I. Pulverman, second vice-president and general manager; S. A. Moore, secretary and treasurer; T. J. Walsh, sales manager. Principal office, Charleston, West Virginia. To manufacture the Pulverman Tirometer valve.

FIRESTONE'S EASTERN SALES MANAGER.

JOSEPH E. MAYL, eastern sales manager of the Firestone Tire & Rubber Co., Akron, Ohio, is a native of Dayton, Ohio, in which city he was born December 15, 1888. His education was obtained in St. Mary's College, Dayton, and later in the University of Pennsylvania, Philadelphia.

JOSEPH E. MAYL.

Mr. Mayl began his business career with the Chalmers Motor Co. in June, 1909, and from September, 1910, until May, 1911, was with the Gordon Motor Co., Richmond, Virginia. On the latter date he came to the Firestone company as a salesman in the St. Louis, Missouri, branch and his advancement since that time has been rapid. In December, 1915, he was promoted to manager of the Memphis, Tennessee, branch and in May, 1917, was transferred in the same capacity to the Cleveland, Ohio, branch. December, 1918, found him New England district manager with headquarters in Boston, Massachusetts, and since January of the present year he has been eastern manager with headquarters in Akron, Ohio.

Obviously Mr. Mayl's record of achievement is still far from complete.

EUROPEAN FOOD DRAFTS.

Rubber companies are requested to inform their foreign-born employes concerning the plan of the American Relief Administration, 115 Broadway, New York City, of which Herbert Hoover is chairman, to facilitate the distribution of food in the European countries threatened with famine, by means of "food drafts." Those employes who are anxious to help their relatives in the home countries have been sending money, which is of little use, owing to the prohibitive price of food.

Food warehouses are now open at Hamburg for Germany, Warsaw for Poland, Vienna for Austria, Budapest for Hungary and Prague for Czecho-Slovakia, with branches in the principal towns. These depots will honor food drafts issued by American banks, and give out the food called for to the person to whom the draft is sent.

The plan is endorsed by the American Bankers' Association, the American Red Cross, the Y. W. C. A., and the Governments of the five countries involved. The food will be given out only at the warehouses and the buyer of the draft will be notified when the food has been delivered.

NEW PRESIDENT OF A. SCHRADER'S SON, INC.

CHARLES SCHWEINERT, the recently elected president of A. Schrader's Son, Inc., Brooklyn, New York, presents a notable instance of that constant advancement through long and faithful service which has been one of the chief bulwarks of success in American industry. Thirty-four years ago he entered the employ of the company in the capacity of office boy, and has ever since been associated with the growth and development of the concern from a small three-story factory in New York to the present seven-story fireproof building occupying an entire block in Brooklyn. He has an intimate knowledge of every detail of the business, gained from experience, and enjoys among the firm's workmen a wide popularity no less genuine than the esteem in which he is held among the men who have made and now direct the tire industry. Both rejoice for and with him in this culminating stage of his advancement.

CHARLES SCHWEINERT.

Mr. Schweinert is an ardent sportsman and numbers among his clubs the New York Athletic Club, the Columbia Yacht Club, Society of Automobile Engineers, Machinery Club and the Akron City Club.

STATEMENT AND BALANCE SHEET OF THE INTERCONTINENTAL RUBBER COMPANY.

THE DIRECTORS of the Intercontinental Rubber Company, 15 Exchange Place, Jersey City, New Jersey, have submitted to their stockholders the following balance sheet and statement of surplus account for the fiscal year ended December 31, 1919. The statements have been prepared and certified to by Messrs. Loomis, Suffern & Fernald, chartered public accountants, New York City.

CONDITIONS IN MEXICO.

Operations at the company's Torreon factory were suspended on June 30, 1919, due to decreased shrub deliveries and low crude rubber prices. Advantage was taken of the opportunity to carry out extensive repairs and alterations, the latter designed to decrease the cost of production and increase recovery of rubber. Prices having somewhat recovered and a satisfactory demand for guayule rubber having developed, operations were resumed on December 15. General conditions throughout Mexico have, on the whole, improved and it is believed that a recurrence of paralyzing disorder is improbable. Claims for physical losses and damage to property during the revolutionary period have been lodged with a Claims Commission constituted by the Mexican Government, and the case will be followed with due diligence.

AMERICAN CONGO COMPANY IN AFRICA.

A number of years ago it became apparent to the directors of your company that wild rubber could not be profitably produced from the African Concessions of the American Congo Company in competition with Malaysian plantations, which will this year produce 90 per cent of the world's supply. Various unsuccessful attempts were made to utilize the Congo Company's position to financial advantage, and in 1916 the option to purchase 500,000 hectares of land for Frs. 10,000,000 was allowed to expire, nothing having developed to warrant the expenditure of additional capital. Therefore, during 1919 the directors took advantage of an opportunity to sell the company's stock in the American Congo Company for $25,000 in cash plus a contingent interest in a claim against the German Government for rubber confiscated in Belgium. Although difficult to establish and collect, the claim may ultimately have a value to your company of $56,250. The established loss of $170,112.50 was charged on the company's books against the general reserve previously set up against contingencies of this character.

SUMATRA PLANTATION.

The development of the Sumatra plantation continues to show satisfactory progress, but with increased costs due to the fact that rice, the principal food of the estate laborers, now costs eight times the pre-war price.

ARIZONA GUAYULE PLANTATION.

Experimental work on the Arizona guayule plantation has continued with what the directors believe to be very encouraging results.

CHILEAN NITRATE SYNDICATE.

Your company has participated in a syndicate formed to purchase and exploit a large tract of proven nitrate land in the Republic of Chile. The enterprise is promising, but its final development may be held in abeyance until there is an improvement in the general situation with regard to new construction and the procurement of equipment.

INVESTMENT SECURITIES.

The item of Investment Securities is made up of Liberty Loans, bonds and short-time notes. As will be seen by reference to the Surplus Account, the sum of $58,202.27 was deducted from income to adjust this account to the market quotations of December 31, 1918.

BY ORDER OF THE BOARD OF DIRECTORS.
WILLARD P. SMITH, Secretary.

April 5, 1920.

CONDENSED BALANCE SHEET—DECEMBER 31, 1919.

ASSETS.

Investments in		
Merged and subsidiary companies:		
By cash	$3,762,159.09	
By stock issues	28,198,575.30	
		$31,960,734.39
Patents (exclusive of subsidiary companies)		15,141.77
Accounts and notes receivable, etc.:		
Advances to subsidiary companies	$305,653.71	
Sundry accounts	78,800.90	
		384,454.61
Advances on rubber		6,061.43
Investment securities		1,379,346.27
Cash		316,258.74
		$34,061,997.21

LIABILITIES.

Capital stock: common	$29,031,000.00
Accounts payable, taxes accrued, etc.	20,596.43
Reserve accounts	564,321.21
Surplus (as below)	4,446,079.57
	$34,061,997.21

SURPLUS ACCOUNT

Surplus December 31, 1918		$4,417,297.77
Total profits and income from investments, etc.	$215,237.25	
Less:		
Administration, general expenses and taxes	55,923.08	
	159,314.17	
Depreciation in market value of securities at December 31, 1919	58,202.27	101,111.90
		$4,518,409.67
Charges against surplus:		
Cost of caring for Mexican properties (or shut-down expenses) 1918-1919		72,330.10
Surplus December 31, 1919		$4,446,079.57

UNITED STATES TIRE PROMOTES SALES EXECUTIVES.

Substantial promotion has come to six of the oldest executives in the sales department of the United States Tire Co. through the creation of six important new positions. The entire country has been divided into six large divisions, each to be under the direction of a sales manager, working directly under George S. Shugart, general sales manager.

In making these appointments the company has followed its custom of filling good positions with men developed in its own ranks, thus offering an incentive to those who remain in the organization to qualify for better places. It is worthy of note that the average length of service of the six appointees is eighteen years with the company, or with companies now merged with it.

E. H. Kidder, who advances from the position of Boston district manager to New England sales manager, has been a familiar figure in tire circles in New England for fifteen years. After six years as a salesman, he took charge of the United States Tire Company's Boston branch in 1911, and in 1916 he was made district manager. His activities have centered in Boston since that time, except for a year spent in the service of the Emergency Fleet Corporation during the war. The position to which he has just been promoted gives him supervision of sales throughout New England, with headquarters in Boston.

E. S. Roe, who becomes Eastern sales manager, with headquarters at New York, is one of the oldest tire men in the United States in years of service, and is unquestionably the dean of the tire fraternity in New York. Next year he will complete a quarter century in the tire business. His connection with the industry began April 1, 1896, when he entered the bicycle tire repair shop of the Hartford Rubber Works Co., in New York City, as a repairman, and worked up through various office positions to be counter salesman. When an uptown branch of his company was opened he was made manager, which meant little, for he was the only man there and did everything from sweeping out to selling.

In 1903 the two New York branches of the Hartford were consolidated and Mr. Roe became New York district manager. When the United States Tire Co. superseded the Hartford in 1911, he was made New York branch manager by the larger concern, and in 1913 took charge of the New York district.

Thomas R. Burton, who takes over the sales managership of the Detroit division, is a twenty-year man in the company's service. He began as salesman for Morgan & Wright in New York in 1900, and nine years later was made Boston branch manager by the same company. In 1911 he became Pittsburgh branch manager for the United States Tire Co., and in 1912 went to New York as assistant to the eastern district manager. In 1914 he assumed the duties of district manager at Atlanta, remaining there until 1918, when he acted for a time as district manager at Boston and later in an executive capacity in the general offices at New York City. In June, 1919, he was made district manager at Kansas City.

P. C. Anderson, western sales manager, began as an office boy 23 years ago at a wage of $2.50 a week, with Morgan & Wright, then located in Chicago. He worked up through various clerical positions, and in 1910 became assistant branch manager. On the formation of the United States Tire Co. he was made office manager at Chicago for the larger company, and a year later, central district office manager. In 1914 he took charge of the Minneapolis branch. Five years ago he became branch manager at Chicago, and on January 1, 1917, stepped up another grade to the position of Chicago district manager.

Harry H. Hubbard, southwestern sales manager, entered the company's employ in 1903 as a bill clerk in the office of the G. & J. Tire Co. at Indianapolis. He served in the adjustment department and as traveling salesman until 1911 when, upon the formation of the United States Tire Co., he became Indianapolis branch manager for the larger firm. From 1912 to 1917 he was branch manager at St. Louis, and then went to Minneapolis for a year as district manager. The next year he spent as district manager at Kansas City. For the past year he has acted as western manager of distributers' sales, with headquarters at Chicago.

E. H. Kidder. E. S. Roe. Thomas R. Burton. P. C. Anderson. Harry H. Hubbard. William C. Price.

The connection of William C. Price, new southern sales manager, with the company, dates back to 1908, when he began as a traveling salesman at Pittsburgh for the Hartford Rubber Works Co. In 1912 he became a salesman for the United States Tire Co. at Cincinnati, and made a record that brought him promotion to the place of branch manager and then district manager in that city. In 1918 he went to Dallas, Texas, and established the company's new Texas district, and in October, 1919, was made district manager at Atlanta.

GRAND RAPIDS TRUCK TERMINAL OUTGROWN.

The rapid growth of the "ship by truck" movement in various sections of the country seems to forecast a greatly increased consumption of truck tires, both solid and the new giant pneumatics. The Minneapolis truck terminal, described at some length in the December issue of The India Rubber World, has close parallels in Grand Rapids, Michigan; St. Paul, Minnesota; and Louisville, Kentucky, while others will be added to the list with the coming of spring. The Ship by Truck Bureau of the Firestone Tire & Rubber Co., Akron, Ohio, is largely responsible for the movement.

The Grand Rapids truck terminal, which operates under the name of the Associated Truck Lines of Grand Rapids, was started in June, 1919. There are now 19 routes operating 32

motor trucks. Goods from wholesale and retail stores are carried from 22 to 50 miles into the country and neighboring towns, while farm produce and miscellaneous goods are handled on the return trips. By this means Grand Rapids merchants have stopped the inroads of Milwaukee wholesalers on their business made possible by lake transportation. By September the terminal was forced to move to larger quarters and is now handling more than 170,000 pounds of freight daily.

MEETING OF COMMITTEE D13, AMERICAN SOCIETY FOR TESTING MATERIALS.

Committee D13 of the American Society for Testing Materials met at the United Engineering Societies Building, New York City, April 16, 1920, and adopted the report of the Sub-committee III on Testing Machines and also voted to adopt the General Methods for Testing Cotton Fabrics designated as D39-18T, following a few minor changes.

Important papers on "Testing Machines and Laboratory Procedure," by W. O. Jelleme, A. E. Jury, and E. H. Barnwell, preceded a general discussion of proper recommendations by the committee on type of testing machines for textiles and suitable capacities for fabrics of varying strengths. The variables affecting the indicated breaking strength of a fabric to which special attention was drawn in the paper above mentioned were: (1) the design of the jaw; (2) machine capacity; (3) machine rate of load; (4) speed of pulling jaw.

The committee's recommendation in the matter of suitable machines for textile testing favored the inclined balance of pendulum type, limiting the use of individual machine to that capacity corresponding to the pull exerted when its pendulum makes an angle with the vertical not exceeding 40 degrees, beyond which point the rate of loading varies sufficiently to make accurate comparative tests impossible on machines of different capacities. The rate of loading recommended is 250 pounds per inch of travel of the head jaw, namely, the jaw attached to the dynamometer.

"The Measurement of Crimp in Yarns and Fabrics," by A. N. Gadsby and E. D. Walen, of the Textile Research Co., stated that crimp should be considered as the difference in distance between any two points on a yarn in a fabric and between the same two points after the yarn has been removed and straightened. The importance of determining crimp is indicated by the fact that the difference between the crimp of the warp and the filling of a tire fabric, designated as "off square," shows the disproportion in which the strain on the fabric will come in the finished tire.

Other papers of interest were "Possibilities of Air Conditioning for Textile Testing Laboratories," by A. M. Thompson, of the Cramer-Parks Company; "Moisture Effects upon Ducks of Varying Weights, and Fabrics of Unusual Character"; also "Variation of Apparent Strength with Machine Capacity," by G. B. Haven; "Experiments on Impact Testing for Fabrics," by E. D. Wallen, briefly discussed the breakage of groups of yarns from fabrics by their resistance to breaking by the sidewise impact of a swinging pendulum.

RUBBER BOOTS AND RAINCOATS FOR THE ARMY.

During the war the Clothing and Equipage Division of the Quartermaster General's Office bought 2,885,092 pairs of rubber hip boots at a cost of $14,616,432 and 8,329,791 raincoats at a cost of $44,932,308. In the first year of the war, from April 1, 1917, to June 30, 1918, the unit price of boots was $4.82 and the 1,370,619 pairs cost $6,606,384; in the year, June 30, 1918, to June 30, 1919, the price was $5.289, and the 1,514,473 pairs cost $8,010,048. The stock on hand to be accounted for on June 30, 1919, was 687,781 pairs, of which 116,202 were at supply depots, 600 at camps and posts, and 571,069 were overseas or in transit; 102,148 pairs were lost at sea during the war.

The price of raincoats the first year was $5.21 so that the 4,744,822 supplied cost $24,720,523. In the second year they had devised different coats for foot and mounted men. The raincoats for the latter cost $5 each so that $330,000 was paid for the 66,000 coats furnished. Most of the coats, however, were for the men who had to march, the price being $5.65 and the 3,516,369 raincoats supplied cost $19,878,785. The number in stock on June 30, 1919, was 354,965 infantry and 25,457 horsemen's coats in the United States and 886,464 raincoats in all overseas, making a total of 1,264,886 coats on hand. Besides these, 34,990 raincoats had been lost at sea.

GENERAL MANAGER, SYRACUSE RUBBER CO., INC.

George R. Loggie, treasurer and general manager of the Syracuse Rubber Co., Inc., Syracuse, New York, was born March 27, 1882, in Aberdeen, Scotland. Coming to this country with his people when a boy, he early set out to take care of himself, his only assets being a healthy body and an active, ambitious mind. In 1901 he entered the factory of the Diamond Rubber Co., Akron, Ohio, as a laborer and learned the manufacture of tires from the bottom up. From that time to the present he has been identified with the tire business in various capacities. He found time, however, to attend night school and eventually became an instructor in a business college which he attended. For a time he was a salesman for the Miller Tire & Rubber Co., and afterward was placed in charge of the Miller branch at Syracuse, New York.


George R. Loggie.

After a few years in Syracuse he tried to start a tire factory and failed, but one failure did not discourage him, and in 1919 he organized the Syracuse Rubber Co., Inc., and was elected treasurer, general manager, and a member of the board of directors.

Mr. Loggie is a member of the Elks and of the Optimist Club and is popular socially as well as in business circles.

W. R. GRACE & CO. PIONEER RUBBER IMPORTERS.

The interest of W. R. Grace & Co. dates back to 1854, when a group of rubber boot and shoe manufacturers appointed the firm their sole importing agent. The growth of the business brought about the formation of Sears & Co. in 1859 as a branch house at Pará and Manáos, and most of the rubber consumed in the United States passed through the hands of W. R. Grace & Co. From the early 'seventies until 1886 the greater portion of the crude rubber coming into New York went to that firm.

With the attempt of Charles R. Flint to monopolize the rubber market, Mr. Grace undertook to withdraw from the rubber trade, but to do this completely was impossible with an importing house of such magnitude. The dealings, however, were as small as possible till Mr. Grace died in 1904.

When plantation rubber became of importance, W. R. Grace & Co. became interested in crude rubber again, and since 1912

have had agencies in the principal markets of the world, London, Pará, Manáos, Singapore, Batavia, Medan, and Ceylon, with many correspondents throughout South America and the Orient.

C. KENYON CO. TO MANUFACTURE CORD TIRES.

On April 1, the C. Kenyon Co., Brooklyn, New York, operating the largest fabric rubberizing plant in the United States, started manufacturing Kenyon Cords, a new high-grade cord tire.

KENYONS' PLANT, BAY RIDGE, BROOKLYN.

Back of the Kenyon entry into the tire manufacturing field are over sixty years of experience in handling and manipulation of rubber, and the resources of a great plant equipped with modern tire-making machinery.

The decision of the Kenyon company to make cord tires is a logical development of their business and previous history. Starting in 1857, the company had acquired through long and varied experience an intimate and unique knowledge of rubber, its compounding, and its application to fabric. The two plants on Pacific street, Brooklyn, and on the Bay Ridge waterfront employ nearly 3,000 persons, and the products range from raincoats to the large rubber blankets used in offset printing plants. The company has been successful in producing cord fabrics for other tire manufacturers, and it is natural, in view of this, that the Kenyon brothers should decide to begin the manufacture of tires.

KENYONS' PLANT, PACIFIC STREET, BROOKLYN

The Kenyon company intends to produce oversize cord tires of the highest grade exclusively. Furthermore, the Kenyons have patented a new tread of rectangular form and truly non-skid properties because it offers a straight line resistance to both the side and forward skid. The tires are to be made at the Bay Ridge factory, a building of modern concrete construction and equipment, completed only last year, and having an initial capacity of 500 tires daily with provision for enlargement. Besides every mechanical feature known to make the building safe, the factory contains such provisions for the service and health of the employes as a cafeteria with food at cost, recreation and smoking rooms, a roof garden and a finely-equipped hospital with a competent medical staff.

GOVERNMENT SALE OF HIP BOOTS AND OVERSHOES.

The director of sales of the War Department announced that the Surplus Property Division of the Quartermaster General's office had disposed of rubber goods at the subjoined prices, on the bids received up to the afternoon of February 15, 1920:

New rubber hip boots: 120 pairs at $4.00, 120 at $3.65, 600 at $3.271, 2,000 at $3.25, 120 at $3.15, 240 at $3.10, 3,000 at $3.065, 1,000 at $3.015, 120 at $3.00, 840 at $2.90, 5,740 at $2.85, 1,200 at $2.775, and 48,520 at $2.75, nearly all of the last to one company.

New all rubber overshoes: 200 at $2.05, 200 at $2.00, 200 at $1.75, 2,400 at $1.50, 6,142 at $1.49, 250 at $1.465, 1,000 at $1.45, 200 at $1.41, 2,000 at $1.40, 4,480 at $1.35, 1,000 at $1.33, and 67,440 to one company at $1.29.

GEORGE W. SHERMAN, SALVAGE EXPERT.

GEORGE W. SHERMAN, for many years connected with The B. F. Goodrich Co., and now devoting his time to the development of the Akron Industrial Salvage Co. and other personal interests, graduated from the Massachusetts Institute of Technology in 1894 and immediately became connected with Colgate & Co., soap manufacturers, as assistant mechanical engineer. He was later identified with the Boston Woven Hose & Rubber Co. as master mechanic, and subsequently entered business for himself in Boston as a consulting mechanical engineer.

GEORGE W. SHERMAN.

Late in 1901 he came to Akron and was sent to Liverpool, England, by the stockholders of The Diamond Rubber Co., which at that time owned the Northwestern Rubber Co., of Liverpool. This company was engaged largely in reclaiming rubber, and Mr. Sherman served there as superintendent. Coming back to Akron several years later, he became the first mechanical engineer of the Alkali Rubber Co., now The Philadelphia Rubber Works Co. In 1908 he returned to the Diamond Rubber Co. and assumed charge of all by-product, scrap and salvage work, continuing as the head of these departments and in the same capacity for The B. F. Goodrich Co. after the consolidation, until his resignation on January 1 of this year.

It was during the war that Sherman organized the Akron Industrial Salvage Co., having as its members one hundred and twenty-five Akron manufacturers and merchants. The value that these members gained from their waste products so increased the scope of the work that it now calls for practically all of Mr. Sherman's time. His plan of organization was so thorough and effective that the Department of Commerce issued a special government bulletin dealing with the detailed development of the plan and its vast possibilities.

In addition to his other activities, Mr. Sherman is also in charge of the chemical department of The McAdoo-Akron Co., a new corporation recently organized to manufacture a rubberized cotton work glove.

EASTERN AND SOUTHERN NOTES.

By Our Regular Correspondent.

THE FISK RUBBER CO., Chicopee Falls, Massachusetts, has added to the site of its proposed building at Broadway, Eighth avenue, and Columbus Circle, New York City, the properties at Nos. 956-958 and 960-962 Eighth avenue.

The United States Rubber Reclaiming Co., Inc., will occupy temporary quarters at No. 20 West 60th street, New York City, pending the erection of its new building.

The Rubber Importers & Dealers Co., Inc., New York City, has increased its authorized capital from $500,000 to $1,000,000, and will remove on May 3 from its present location at Nos. 67-69 Wall street, to larger quarters at No. 200 Broadway.

The Triplex Tire Corporation, 903 Sixth avenue, New York City, has changed its name to Martin Tire Corporation. James Martin is president. The "Mono" cord tire and "Martin" supercord tire, manufactured by this concern, were illustrated and described in our issue of February 1, 1920, on page 300.

Alfred Smith, Limited, dealer in chemicals for the rubber trade, will remove on May 1, 1920, from 98 Maiden Lane to Room 25, No. 98 Park Place, New York City.

Charles E. Wood, crude rubber broker, has removed from 149 Broadway to 287 Broadway, corner of Reade street, New York City.

In order to promote fraternalism among New York City rubber trade employes, the Rubber Trade Employes Social Society held an informal supper and dance at the Hotel McAlpin, April 14, when a very enjoyable evening was spent by the three hundred attending.

Pell & Dumont, Inc., dealer in crude rubber, has removed from 68 Broad street to 6-9 Hanover street, New York City.

Edwin M. Berolzheimer has been elected vice-president of the Eagle Pencil Co., New York City, in charge of factory operation.

The Morse Chain Co., Ithaca, New York, has moved its Greensboro, North Carolina, office to 404 Commercial Bank Building, Charlotte, North Carolina, where a complete exhibit of chain drives will be in operation. George W. Pritchett is southeastern manager.

Dunlop America Limited has closed its temporary office in New York City and established its whole staff in temporary quarters on the site of its new factory at Buffalo, New York. Quarters have been built to take care of 1,000 workmen on the new plant, and about 1,200 are being employed on the project. The foundations of some of the buildings are already completed and towers erected for the pouring of concrete for the finished-product warehouse, to be 560 feet long and four stories high. P. D. Saylor is vice-president and general manager. Mail for the company should be addressed to Postoffice Box No. 448, Buffalo, New York.

The Hewitt Rubber Co., Buffalo, New York, is building a two-story addition to its office building, which will cost approximately $25,000.

The Hydraulic Press Manufacturing Co., Mount Gilead, Ohio, has opened an office in the Mutual Life Building, Buffalo, to take care of business in that territory. R. K. Havlicek is in charge.

E. I. du Pont de Nemours & Co., Wilmington, Delaware, has elected the following directors for the ensuing year: F. D. Brown, H. F. Brown, E. G. Buckner, R. R. M. Carpenter, Walter S. Carpenter, Jr., Frank L. Connable, William Coyne, A. Felix du Pont, Alexis I. du Pont, Eugene du Pont, Eugene E. du Pont, H. F. du Pont, Irenée du Pont, Lammot du Pont, P. S. du Pont, J. B. D. Edge, H. G. Haskell, J. A. Haskell, J. P. Laffey, C. A. Meade, Charles A. Patterson, Charles L. Patterson, F. W. Pickard, H. M. Pierce, John J. Raskob, Charles L. Reese, W. C. Spruance, and F. G. Tallman.

Yarnall-Waring Co., Chestnut Hill, Philadelphia, has recently opened an office in the Candler Annex, Atlanta, Georgia, in charge of D. T. Newman, formerly with the Philadelphia sales office.

The factory staff of the New Castle Rubber Co., New Castle, Pennsylvania, as recently organized, consists of: L. C. Sturgis, works manager; K. E. Rogers, purchasing agent; C. A. Hemingway, manager material service; V. C. Hossellman, manager factory accounting; Willis H. Grant, chief chemist; F. T. Zesiger, operating superintendent; R. J. Carl, material preparation superintendent; M. H. Daniels, technical superintendent. C. L. Copley, formerly operating superintendent, has been placed in charge of the cord tire development department.

THE RUBBER TRADE IN NEW JERSEY.

By Our Regular Correspondent.

TRENTON NOTES.

THE TRENTON RUBBER MANUFACTURERS began to feel some uneasiness over the recent railroad strike because of the scarcity of coal and the fact that raw materials might run short. The Empire Rubber & Tire Corp. was the only rubber plant that was compelled to shut down for a couple of days because of the scarcity of coal. The plant is now in full operation again. The various rubber companies have their warehouses overcrowded with goods due to the strike and it will take some time to get the product started on the road. Meantime, customers were compelled to wait for the shipment of supplies. Fortunately the Trenton concerns had enough raw materials on hand to tide them over the strike.

Hyman A. Rosenthal, proprietor of the Nearpara Rubber Co., 79 Prince street, Trenton, whose plant was destroyed by fire a short time ago, has awarded a contract for a new structure. The main plant will be constructed of steel, one story in height, and will measure 100 by 125 feet. There will also be a boiler room and power plant attached. The company expects to be ready for operation again by June 1. The machinery, which was badly damaged by flames, will be overhauled and rebuilt by the William R. Thropp & Sons Co., of Trenton. The fire entailed a loss of between $90,000 and $100,000. A temporary office building has been erected to take care of business until the new works is completed.

Andrew Wurfflein, father of Peter E. Wurfflein, Canadian representative of the New England Rubber Co., died recently at his home in Trenton.

John A. Lambert, treasurer of the Acme Rubber Manufacturing Co., who was recently made president of the Trenton Chamber of Commerce, has stirred up the Trenton merchants by declaring that outrageous profiteering is being carried to extremes. He has called a meeting of the merchants to discuss the high cost of living. He has also taken up the question of a shortage of houses in Trenton, and says that he finds that the scarcity of dwellings is not as great as reported.

The Pocono Rubber Cloth Co., which recently purchased the plant of the Howard Demountable Rim Co., Trenton, and 4½ acres of land, has awarded a contract for the erection of extensive additions. The contract calls for the erection of a power house, 43 by 45 feet; an engine room, 25 by 70 feet, and a drying and unloading building, 26 by 170 feet. The buildings will be one story, of brick and concrete, and the entire work will cost about $50,000. There will also be another structure to house two large vulcanizing rooms. The work is to be completed in eight weeks.

The Acme Tire Co., of which W. Bradford Stryker is general manager, is having a new building erected on East Front street, Trenton. The company's present home will be razed to make room for city improvements.

The Ajax Rubber Co., Inc., Trenton, recently gave an entertainment at the Crescent Temple and had as guests its 1,200 em-

ployes and their families. All the higher officials of the company were present when manager Louis P. Destribats announced that the concern had decided to grant free life insurance to all the employes of the works. At the entertainment exclusive motion pictures were shown and the guests enjoyed a banquet and dancing. The company reports conditions prosperous and will shortly enlarge the plant.

William J. B. Stokes, treasurer of the Thermoid Rubber Co., and Mrs. Stokes have left for an extended trip through the West Indies and Panama. They will be absent for several weeks and will stop at Havana, Kingston, Santiago, Costa Rica, Panama and the Bahama Islands.

MISCELLANEOUS NEW JERSEY NOTES.

The Manhattan Rubber Manufacturing Co., of Passaic, New Jersey, will build a plant on the Whippany River, near Morristown, for the purpose of reclaiming rubber. Several buildings of reinforced concrete, to cost $500,000, will be erected and the company will employ 250 men. Later, homes for the workmen will be erected.

The Lambertville Rubber Co., Lambertville, New Jersey, will erect a large brick building along the creek and will eventually do away with the present frame factory buildings. The company will also erect a brick building for its printing office.

The Rubber Celluloid Products Co. will erect a one-story brick storage building at its plant at Newark, New Jersey, 39 by 69 feet, at a cost of $11,000.

During the recent transportation tie-up the Somerset Rubber Reclaiming Works, New Brunswick, New Jersey, maintained a fleet of motor trucks in constant operation to afford their customers prompt service.

The Intercontinental Rubber Company, Jersey City, New Jersey, at its annual meeting on April 5, elected the following officers and directors: G. H. Carnahan, president; E. B. Aldrich, vice-president; J. C. Treadwell, vice-president; W. P. Smith, secretary and treasurer: G Harrington, assistant secretary; directors—G. H. Carnahan, chairman; E. B. Aldrich, H. A. Bingham, C. A. Corliss, W. Dutton, J. R. Morron, Elton Parks, W. C. Potter, F. T. Rosen, C. H. Sabin, W. P. Smith, and H. H. Vreeland.

The Fulton Rubber Type, Ink and Pad Company, which was incorporated under the laws of New Jersey, December 13, 1905, changed its name on June 11, 1915, to Fulton Specialty Company. The principal office is now located at 128-142 Fulton street, Elizabeth, New Jersey, and the agent in charge is E. Rogers Underwood. The authorized capital stock of the company is $150,000, and the company manufactures stamp pads, rubber type, daters, etc

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

While there is little change in the business situation among the Rhode Island rubber mills, the textile establishments engaged in the production of tire fabrics throughout the state, are being driven to their utmost capacity with day and night shifts. Nearly every concern now identified with this growing branch of the rubber industry either has new buildings in process of construction, or is planning extensions of a material size.

The majority of the rubber industries are still rushed with work and have plenty of orders ahead, but the problem of securing enough help is a handicap to many manufacturers who are also confronted by labor unrest. Nor is the shortage of help the only contingency. Railroad strikes with the consequent tie-ups, embargoes, and congestions of freight by rail and by boat, prevent the transportation of supplies and finished products, while the steadily skyrocketing of wages and shortening of hours add to the general disorganization.

Because of the embargo on freight, by both rail and water, the National India Rubber Co., Bristol, early in the month chartered a small 200-ton steamer to help out in the unusual emergency that arose primarily through the strike of longshoremen in New York, and was added to by the consequent strike among the railroad employes. The steamer brought to Providence 175 tons of freight from New York, and loaded all she could carry of the nearly 1,000 tons which had accumulated at the State Pier waiting for transportation. Otto B. Munroe, traffic manager of the Revere Rubber Co., was in charge of the work.

One of the most interesting and important events of the past month in connection with the whole rubber industry was the transportation of upwards of 1,000,000 pounds of cotton fabric, valued at $2,500,000 from Providence and vicinity, to Akron, Ohio. The shipment was made on 100 automobile trucks and was for the purpose of relieving the shortage of tire fabric, due to the railroad strike through the Middle West and the resultant express and freight embargoes. This is said to be the biggest truck transportation venture ever attempted from the East, both in point of distance and volume, as well as in value. The material was collected from the following mills in this vicinity, which usually ship the cotton fabric to Akron by the railroads: Connecticut Mills, Danielson, Connecticut; Naushon Weaving Co. and Passaic Cotton Mills, New Bedford, Massachusetts; Jenckes Spinning Co., Pawtucket, Rhode Island; Ninigret Mills and Westerly Textile Co., Westerly; and Goodyear Cotton Mills, Inc., Killingly, Connecticut.

Each fleet averaged twenty trucks, headed by a pilot car. Spare trucks for use in case of emergencies were placed along difficult parts of the route in the mountains where the regular machines might break down. The contents of each truck was insured at $25,000 for the trip. The cotton fabric is valued at $2.50 a pound, so that the 1,000,000 pounds which were moved within a week was worth $2,500,000. The use of trucks will be continued at least until freight service becomes normal, the trucks returning here from Akron loaded with western products which have a market in this vicinity, so that no truckage distance is wasted.

About 500 members and friends were present at the first annual dance of the Davol Rubber Company Benefit Association, Providence, held on April 16. A short address on the benefits to be derived from membership in the association was given by general manager Wesley. The association is open to all persons over 16 years of age employed by the concern. The officers are as follows: president, Joseph Harris, Jr.; vice-president, M. Burnham; secretary, A. Goff; treasurer, C. Bamford; directors—Frederick Keenan, Anna Riley, Nellie Ward and Thomas Ryan.

The Goodby-Rankin Co., with headquarters at Providence, has opened its new quarters at 37-49 Snow street, removing thereto from 57 Westminster street, where the company has been located for nearly twenty years. The new building has four floors and a large basement, with two elevators for freight and a large sunny show and salesroom, with every facility for handling the firm's large tire trade.

The Hayward Rubber Co. is fitting up a new store on Union street, near Washington street, Providence. There will be new balconies, show cases, counters, new entrance, new windows, hardwood floors, steel stairways and paneled work.

The O'Bannon Corporation, at West Barrington, Rhode Island, will erect a 100,000-gallon water tank on its premises, for fire protection.

Good progress is being made on the new mill being erected for the Mount Hope Spinning Co., Warren, Rhode Island. This concern has been operating 13,000 spindles on tire fabric, but with the new mill 26,000 spindles will be available. The new structure, which is 200 feet long, and two stories high, will be occupied the first of August. A new warping room extension

is being erected which almost connects the old and the new structures. Other improvements are under consideration and it is expected that the coming summer and fall will witness numerous additions to this plant and its equipment.

The Ninigret Co., manufacturers of tire fabrics, is enlarging its plants at both Pawtucket and Westerly, Rhode Island, to practically double their capacity, by the purchase of property adjacent to its present holdings. It intends to erect new buildings of the latest type, to be equipped with modern up-to-date machinery. During the past month the concern has purchased a large tract of land on Middle and Fountain streets and Central avenue, in Pawtucket, the revenue stamps affixed indicating an outlay of approximately $39,500. Only a short time previous the corporation purchased property immediately adjoining its plant in Pawtucket, at a cost of $35,000.

Work is to be started soon on a $15,000 brick addition, one-story high, to the plant of the Phillips Insulated Wire Co., at Pawtucket. It will be 45 by 81 feet, of mill construction with steel beams. Other additions and improvements will probably be carried into effect during the coming summer.

The American Wringer Co. is erecting a new building on Social street, Woonsocket, where rubber-covered mechanical rolls will be made. It is to be a three-story brick structure, 180 by 60 feet, and will be completed early in October. More than 100 hands will be employed in the new mill.

THE RUBBER TRADE IN MASSACHUSETTS.

By Our Regular Correspondent.

RUBBER GOODS amounting to $20,757,875 represented about one-thirteenth of the value of all manufactures in Massachusetts for the year 1918, according to the thirty-third annual report of the director of statistics, which has just been published. Substantial gains over the previous year are shown, and the state still maintained its leading position in the manufacture of rubber boots and shoes.

Eight establishments with an invested capital of $27,562,384, using stock and materials valued at $21,673,939, and paying wages amounting to $11,162,572 to an average of 13,815 wage earners, produced rubber boots and shoes to the value of $54,098,670. Wage earners averaged $808 annually, there being about 8 males to 5 females.

Forty-three establishments with an invested capital of $44,-791,412, using stock and materials valued at $31,481,177, and paying wages amounting to $7,588,584 to an average of 7,613 wage earners, produced other miscellaneous rubber goods to the value of $66,659,205. Wage earners averaged $996.79 annually, there being about 12 males to 3 females.

The total value of rubber goods exports is not stated, but nineteen establishments selling rubber products exclusive of rubber boots and shoes exported goods valued at $1,814,350.

The average number of wage earners in the rubber industry of the state shows remarkable uniformity throughout all months of the year, operatives on rubber boots and shoes averaging 287 working days, and operatives in all other lines of rubber goods 278.8 working days. Weekly salaries ranged from $5 to $35 and above. On rubber boots and shoes most male workers received from $16 to $30 or more; female, from $10 to $25; minors, from $10 to $18. In other miscellaneous lines most male workers received from $15 to $35 or above; female, from $12 to $30; minors, from $7 to $13. Of the 21,428 average rubber workers in the state, only 1,775 were under eighteen years of age.

Whereas, most of the rubber footwear is produced in or near Boston, most of the miscellaneous rubber products are manufactured elsewhere in the state. In metropolitan Boston five establishments, with an invested capital of $23,591,113, using stock and materials valued at $17,581,737, and paying wages amounting to $9,729,789 to an average of 12,075 wage earners, produced rubber boots and shoes to the value of $44,475,483. Wage earners averaged $805.78 annually, there being about 7 males to 5 females. Miscellaneous rubber goods to the value of $17,417,810 were produced by twenty-four establishments with an invested capital of $9,715,814, using stock and materials costing $7,183,310, and paying wages amounting to $2,048,186 to an average of 2,220 wage earners. Wage earners averaged $922.61 annually, there being about 8 males to 3 females.

The Hood Rubber Co., Watertown, Massachusetts, has announced that the plant will close down on Saturdays for twelve weeks during the summer months, with all operatives in the employ of the company for more than three months receiving full pay for a six-day week. Operatives with the company less than three months will receive half-pay for these Saturdays, except those who have worked less than one month, who receive no compensation. The plan takes the place of a summer shut-down and is intended to give an equivalent for Saturday half-holidays during the season of outdoor recreation in a business where half-holidays are difficult to arrange. It is on trial as an experiment this year as it was last and has not been adopted permanently.

"Multibestos Company" is the new firm name recently adopted by the stockholders of the Standard Woven Fabric Co., Walpole, Massachusetts.

The Tyrian Service Association, the recently formed employe organization of the Tyer Rubber Co., Andover, Massachusetts, held the second of a series of dances on the evening of April 6. Frederick H. Jones, treasurer and general manager of the company, was present and in a brief address expressed appreciation of the spirit of cooperation manifested. These dances are held to promote community feeling in the organization and the proceeds are used to aid and bring comfort to sick and needy employes.

The Avon Sole Co., Avon, Massachusetts, will enter the tire field shortly with a new tire developed by Everett T. Packard. The company is being reorganized and the plant will be doubled to take care of the new tire building machinery.

Everlastik, Inc., has completed a new three-story mill addition in Chelsea at a cost of approximately $75,000.

Rubber manufacturers are finding their factory papers published in the interests of employes a very potent means of promoting their Americanization work. Not only are the advantages of American citizenship made plain to foreign-born workers, but the March issue of the "Bowohoco News," for example, tells on its front page exactly how to become a naturalized citizen. Incidentally, this news sheet of the Boston Woven Hose & Rubber Co., Cambridge, not only contains the timely personal mention of the plant, but is one hundred per cent American, patriotic and common sense in its suggestion and inspiration. It is a shop paper with interest and a moral for every worker.

The Monatiquot Rubber Works Company, South Braintree, Massachusetts, is bringing an additional reclaiming unit into operation, which it is believed will increase the company's output by 20 per cent. The laboratory, also, has been enlarged and is now in charge of J. F. O'Donnell. The company has recently introduced to the trade two new products for specific uses in rubber compounds.

BOSTON NOTES.

More than 200 members of the Employment Managers' Association met at a luncheon dinner and conference on mutual benefit associations and group insurance at the Hotel Vendome, Boston, April 8. Dr. R. S. Quinby, president of the association and service manager of the Hood Rubber Co., Watertown, presided.

In his address, Dr. Quinby said that the big corporations fully realize that the health of the workers is important to the life

of the concern, and told of the health methods used at the Hood Rubber Co. plant, where some 10,000 men and women have a very small sick rate. Every new employe is given a thorough physical examination to discover defects that can be corrected. When a worker is absent, a nurse calls at his home. If he continues ill, the foreman of the department calls and, upon his report, a sick benefit is paid.

Frank A. Vanderlip, a director of the United States Rubber Co., and former president of the National City Bank of New York, will lecture on business economics at the Harvard graduate school of business administration, beginning September 1.

A conference of all the New England managers of the service department of the United States Tire Co. was held at the Hotel Thorndike, Boston, early last month. Factory representatives were present to discuss technical features of tire construction. R. R. Drake, of New York, at the head of the department, gave a talk on courtesy and business correspondence. A banquet and theatre party furnished the entertainment features.

The Firestone "Ship by Truck" movement is rapidly gaining ground in and about Boston, and despite the severe winter has proved of material assistance to the railroads, especially during the freight and express embargoes when terminals were badly congested and the shortage of freight cars was particularly acute.

It was estimated that approximately 35 per cent of the freight awaiting loading at the railway terminals during the embargoes was intended for delivery at points not more than 50 or 60 miles distant from Boston. The vast bulk of that 35 per cent was capable of being delivered by motor truck.

Aside from the efficiency of delivery, the added service which the motor truck can render, the motor express if more widely used by shippers in New England would relieve a very real burden under which the old-established systems of transportation are laboring.

More than 500 independent trucking operators are listed with the bureau, and wholesalers, manufacturers and others are learning that they may call on the bureau at any time for help in rushing cargoes to distant points or in bringing into the city merchandise and produce from manufacturers in other cities or from the farms. This service, it should be said, is given without cost and without obligation.

The annual costume party of The B. F. Goodrich Co. employes was held on the evening of April 15 at Hotel Hemenway, Boston. The affair was a most enjoyable one, with about five hundred in attendance. Prizes were awarded for the prettiest and funniest costumes. The judges were District Manager F. T. Moore, W. H. Hickey, E. E. Leach and Frank Keene.

The Campbell Motors Corporation, 715 Beacon street, Boston, has been appointed New England distributer for Stronghold tires and tubes and is appointing local dealers throughout the territory. Chester I. Campbell and A. N. Dodge will direct the sales organization.

Green & Swett, 821 Boylston street, are Boston distributers of Madison tires.

The Simplex Rubber Co., 65 Broad street, Boston, has been incorporated under the laws of Massachusetts with a capitalization of $50,000 to manufacture and distribute the Marconi heel rubber, a patent non-skid, tight edge, no-cement rubber heel. Major William F. Killip is president of the company, and William F. Donovan is secretary. The moving spirit in the organization is Gilbert F. Quinn, a man of long and varied experience in the shoe and rubber heel and sole business with the Goodyear and Firestone companies, and the Dryden Rubber Co., of Chicago, Illinois.

The Gillette Tire Co., 587 Boylston street, Boston, is a branch of the Gillette Rubber Co., Eau Claire, Wisconsin, and New York City, and has no connection with the Gillette Rubber Co., formerly at 110 Federal street, Boston, now out of business.

GENERAL MANAGER OF FIRESTONE STEEL PRODUCTS CO.

L. G. FAIRBANK, newly elected vice-president and general manager of the Firestone Steel Products Co., Akron, Ohio, brings to his office a varied business experience well fitting him for his important duties, and enabling him to view problems from the other man's standpoint as well as his own.


L. G. FAIRBANK.

Born in Cleveland, Ohio, February 27, 1886, he was educated in the West High School of that city and in 1905 entered the employ of the Struthers Furnace Co. as a stenographer. Two years later he entered the bookkeeping department and the following year was made purchasing agent.

Attracted by the rubber industry, he obtained a position in the dealers' helps department of the Diamond Rubber Co. in 1910, and two years later went to the Firestone Tire & Rubber Co. as assistant advertising manager. From that time his advancement has been rapid, even in a fast-growing organization conspicuous for constant promotion of men of merit. In 1916 he was made an eastern district manager; in 1918 eastern sales manager, and assumed his present duties the first of the present year.

Mr. Fairbank is a member of all Masonic orders, including the thirty-second degree, Knights Templar and Shrine.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

THE story of rubber in Akron this year will be the expansion of the industry to the four quarters of the world. The business has grown to such proportions that it is no longer possible to confine it to the city itself.

Although approximately $10,000,000 worth of new buildings are now definitely under way, announcements have been made of branches and factories in South America and in the Orient, following the announcement that the Firestone Tire & Rubber Co. will erect a plant in Los Angeles to compete with the Goodyear Tire & Rubber Co. in its new field.

As one means of offsetting mounting costs of raw materials, particularly cotton for fabric, the Firestone Tire & Rubber Co. is sending American machinery into the Far East to replace time-consuming methods of handling crude rubber. The machinery will go into a million-dollar plant the company is erecting on the Kalang River at Singapore, Straits Settlements, the center of the world's crude rubber market. The plant will be operated by a Firestone subsidiary company—The Firestone Tire & Rubber Co. (S. S.), Limited—which was organized for the purpose.

In addition to replacing tedious manual labor with machinery, the plant will clean, condition and compress the rubber in such manner that it will occupy less space aboard ship, thereby saving on freight charges. The cleaning process, carried on by coolie-operated machines, will also effect a saving in that it will permit the rubber to go to the skilled hand of the mill operator immediately upon its arrival in Akron.

The Goodyear company recently announced the establishment of a complete rubber plant in Rio Janeiro, Brazil, primarily to take care of the rubber products business of South America, but also to prepare crude rubber for the manufacture of rubber goods in Akron. The Brazilian plant will cost approximately $1,000,000.

The Goodyear Tire & Rubber Co. is about to build a rim plant in the southern part of Akron on the Baltimore & Ohio Railroad. This move naturally follows the success of the Firestone entry into the rim and steel products business. The new factory will be a one-story brick and steel structure 250 feet wide and 660 feet long and will accommodate 500 workmen. Steel for the structure is arriving daily and a large part of the rim making machinery, for which contracts were let many months ago, has arrived on the ground. It is expected that the new rim factory will be completed about July 1, at which time the present rim department, of 600 daily capacity, will move into the new building.

The Firestone rim plant is being practically doubled and the new addition is nearly complete and ready for operation.

Akron business men and rubber manufacturers do not look upon The Goodyear Tire & Rubber Co.'s Los Angeles and Canadian projects as in any way injuring the position of Akron in the rubber world. Figures prepared by the Akron Chamber of Commerce indicate that if the rubber factories of the city do not expand in the future it will still require the city at least five years completely to catch up with its present industrial development. Much gossip has gone the rounds regarding the moving of rubber plants from Akron, but a personal interview by the writer with practically all the leaders in the rubber industry indicates that these men look upon Akron as the center from which their industries will expand. Akron, they hold, will always be the center of the industry.

For the present, at least, the housing situation in Akron has seriously handicapped the expansion of the industry here. It is estimated that the city is at least 20,000 homes short. Manufacturers hesitate to ask thousands of men to come to the city to fill their plants to 100 per cent capacity when it is practically impossible at present to bring their families and establish homes.

The Akron plan for Americanization promises to be a model for the whole country. The plan was approved at a meeting of Americanization directors at New York City recently and will probably be adopted at a national meeting to be held in Minneapolis, Minnesota, next summer. E. C. Vermillion, formerly with the Firestone Tire & Rubber Co., is now director of Americanization for the city.

Statistics prepared by the Chamber of Commerce of Akron show that Akron plants import an average of 103,374 ship tons of raw materials a year and export 58,016 ship tons. Approximately 42,120 ship tons of tires and rubber goods are exported yearly through Atlantic ports and 6,124 through Pacific ports.

The peak demand for automobile tires in the world will be 80,000,000 a year, it is stated in a report recently made public by the Akron Chamber of Commerce. The estimate includes tires for both pleasure cars and trucks. According to the same report, 45,600,000 tires are being manufactured in the United States at the present time.

At the end of the present year the demand will be 57,000,000 tires a year, it is stated. The figures are based upon the estimates of automobile and truck manufacturers that during the present year 1,600,000 pleasure cars and between 375,000 and 450,000 trucks will be turned out.

With an enrolment of 5,700, the new Goodyear Industrial University was dedicated in Akron last month. The Industrial University makes its advent into the educational world with a faculty of 117, the school's 65 class-rooms being housed in a new $2,500,000 recreational hall of the Goodyear Tire & Rubber Co. The classes, which are free, offer 33,000 employes, courses ranging from Americanization work to post graduate studies for college men and women.

The B. F. Goodrich Co., Akron, is preparing "New Goodrich Field," formerly Liberty Park, for spring athletics. It contains ten acres and improvements will cost $15,000. Athletics at the plant are under the direction of Eddie Connors.

The executive committee of the board of directors of The B. F. Goodrich Co., Akron, has announced that the employes of the company will be permitted to purchase stock of the company. Plans for a campaign to sell the stock to the employes will be announced before July 1.

A large part of the electricity used in The B. F. Goodrich Co., Akron, will be brought 100 miles from West Virginia. The power plant near Wheeling has a capacity of 120,000 kilowatts.

Among the rubber companies which have announced that they will have baseball teams in the field this spring are the Amazon, General Tire, Goodrich, Goodyear, Kelly-Springfield, Miller, Philadelphia and the Star companies.

Rubber company officials are assisting in the formation of a flying club in Akron. The membership will be made up of ex-army fliers. The government war work in aviation in Akron has given the industry a boost here upon which the fliers are depending for a great portion of their success. Commercial aerial transportation will be the main object of the new club.

The Miller Rubber Co. has announced that all unsalaried employes of the company will be given a two-weeks' vacation with pay. Salaried employes will continue to have their regular vacations with pay. If the employes recently granted vacations

Evidence of the Remarkable Growth of Akron During the Last Few Years Is Shown by the Accompanying Photograph. The View Was Taken From the Top of a 250-Foot Brick Smokestack Being Erected by The B. F. Goodrich Rubber Company and Shows How the City Has Expanded in All Directions to Maintain Its Place as the Rubber Center of the World

wish to work they will be given double pay for the period considered as their vacation.

The Goodyear Tire & Rubber Co., Akron, has purchased from the Government the Wingfoot aviation station near Akron and will continue to build and test dirigibles. The consideration paid for the station has not been made public, but it is estimated that approximately $400,000 was paid for it. Tentative plans call for establishment of a flying school for the training of airship pilots, in anticipation of the needs of airship lines in various sections of the country.

Announcement has been made that the Miller Rubber Co. will build extensions to its plant in Akron to cost approximately $861,000. Three buildings are contained in the program. Increased business made the additions necessary.

The Portage Rubber Co., Akron, has elected the following officers for the ensuing year: M. S. Long, president; J. W. Maguire, vice-president; H. M. Kerr, secretary; W. E. Wilson, treasurer, and R. J. Cole, assistant treasurer.

The McAdoo-Akron Company, Akron, was incorporated in July, 1919, and specializes in the manufacture of "Wearflex" rubberized cotton gloves in two styles, one fully rubberized and one palm-faced, reinforced with rubberized fabric. The present officers of the company are: J. S. Pattie, president; G. H. Van Hyning, vice-president; C. D. Benson, secretary; H. C. Wissman, treasurer; T. O. McAdoo, general manager, and B. E. Rockwood, assistant general manager. The directors include the above in addition to G. W. Sherman, F. H. Lahrmar, Dr. S. E. McAdoo and C. K. Strobel.

MID-WESTERN NOTES.

By Our Regular Correspondent.

EARL P. LOGAN, the new director of sales for the Kokomo Rubber Co., Kokomo, Indiana, is one of the youngest sales executives in the business. He left the banking business to take up tires. He was branch manager for the Kokomo company at Dallas, Texas, then district sales manager at St. Louis, and more recently department manager at Chicago.

EARL P. LOGAN.

The International India Rubber Corporation, South Bend, Indiana, has appointed H. C. Buchanan production superintendent. Mr. Buchanan formerly held a similar position with the Kelly-Springfield Tire Co. at Akron, Ohio.

The Akron Engineering Co., Akron, Ohio, is building a new plant for the Lynch Tire & Rubber Co., formerly of Kansas City, but now of Carthage, Missouri. The structure will be approximately 60 by 300 feet, including power house, office, etc., and tires, tubes, and other rubber products will be made.

The Hannibal Rubber Co., 305-306 Hannibal Trust Company Building, Hannibal, Missouri, has completed 80 per cent of its $150,000 modern tire and inner tube plant, and will install machinery to cost approximately the same amount. It will manufacture the "Mark Twain" tire and the "Indian Joe" inner tube, and expects to be able to market production by the autumn. A. E. Gibson is secretary.

The Nebraska Tire & Rubber Co., Omaha, Nebraska, has elected the following officers for the ensuing year: Alva Smith, president; G. C. Peironnet, vice-president; F. M. Holloway, secretary; and W. W. Wuchter, treasurer and general manager.

APRIL MEETING OF THE MID-WEST RUBBER MANUFACTURERS ASSOCIATION.

The April meeting of the Mid-West Rubber Manufacturers' Association was held at the Chicago Athletic Association on Tuesday, April 13, and was attended by fifty members. Luncheon was served at noon, after which remarks were made by a number of those present, and many points of interest to the members of the trade were brought out.

President John T. Christie occupied the chair, and urged upon all those present the importance of extending the membership of the Association to accomplish the aims for which it was organized. He pointed out that the Association is dependent entirely upon its income from initiation fees and annual dues, and that in order to develop the organization and put it upon firm financial footing every member will have to constitute himself a special membership committee, and try to bring at least one new member to each monthly meeting. If this could be done, there would be no question about the success or the influence of the organization. He was very glad to announce that the board of directors has recommended favorable action upon the following applications for membership:

Regular Members.

Braender Rubber & Tire Co.	Rutherford, New Jersey
The Meyer Rubber Co.	Columbiana, Ohio
The India Tire & Rubber Co.	Akron, Ohio
Master Tire & Rubber Co.	Dayton, Ohio
The Cleveland Rubber Corporation Co.	Cleveland, Ohio
Fort Wayne Tire & Rubber Mfg. Co.	Fort Wayne, Indiana
Zenith Tire & Rubber Co.	Cleveland, Ohio
Iowa Cord Tire Co.	Des Moines, Iowa
The National Tire & Rubber Co.	East Palestine, Ohio
The Spreckels Savage Tire Co.	San Diego, California

Associate Members.

Bolle-Watson Co., Inc.	New York City
Bloomingdale Rubber Co.	New York City
Sessions Engineering Co.	Chicago, Illinois
General Electric Co.	Chicago, Illinois
The Herman Tire Building Machine Co.	Lancaster, Ohio
The H. B. Bixler Co.	Akron, Ohio
Meyer & Brown, Inc.	New York City
Tower Cotton Mills, Inc.	Niles, Michigan
The Banner Machine Co.	Columbiana, Ohio
Albert E. Burr Co.	New York City
J. T. Johnstone & Co., Inc.	New York City
Rubber Importers & Dealers' Co., Inc.	New York City
E. S. Kuh & Valk Co.	New York City
L. Littlejohn & Co., Inc.	New York City
Baird Rubber & Trading Co.	New York City
Brander & Curry, Inc.	New York City
Manhasset Manufacturing Co.	Providence, Rhode Island

Upon motion duly adopted the above members were unanimously elected.

Among those who spoke briefly at the meeting were: Ole Hibner, The Cleveland Rubber Corporation Co., Cleveland, Ohio; F. M. Hutchinson, Braender Rubber & Tire Co., Rutherford, New Jersey; W. F. Harrah, National-Standard Co., Niles, Michigan; H. B. Bixler, The H. B. Bixler Co., Akron, Ohio; W. H. Herman, The Herman Tire Bldg. Machine Co., Lancaster, Ohio; Harry Hunter, The Hunter Dry Kiln Co., Indianapolis, Indiana; J. C. Brown, Fort Wayne Tire & Rubber Mfg. Co., Fort Wayne, Indiana; G. G. Yule, The Falls Rubber Co., Cuyahoga Falls, Ohio; C. A. Brunner, General Electric Co., Chicago, Illinois; W. E. Lape, The Barrett Co., Chicago, Illinois; R. Paul McElrath, McElrath Tire & Rubber Co., Ravenna, Ohio.

The remarks of Edward S. Babcox, vice-president of the Akron Advertising Agency Co., Inc., in which he made some comments and suggestions in respect to the immediate future of the demand for tires were listened to with great interest.

After the general meeting of the Association the rubber manufacturers held a further session.

THE RUBBER TRADE ON THE PACIFIC COAST.

By Our Regular Correspondent.

LOS ANGELES NOTES.

Much of the success of the young and flourishing Samson Tire & Rubber Corporation, Los Angeles, California, is due to the energetic president and general manager, Adolph Schleicher, who founded the corporation, although he modestly gives the major part of the credit to his loyal and capable coworkers. Mr. Schleicher is a graduate of Purdue University, Indiana., where he specialized in civil engineering. After building plants for the Home Telephone Co. in Indianapolis, the Columbus, Greene, and Richmond traction companies and part of the McKinley Traction Co.'s plant, he became vice-president of the Mutual Tire & Rubber Co. of New York. He is a director and was formerly president of the Monterey Land Co., and for eight years was president of the Pacific Slope Development Co. of Los Angeles. Mr. Schleicher was also president of the International Electric Co. of Delaware until that concern was merged into a larger one.

ADOLPH SCHLEICHER.

The Goodyear Tire & Rubber Co. of California is making a special effort to finish its flying field in Los Angeles. The aerodrome and its equipment is reported to be the finest in the country excepting only those built by the Federal Government. A complete hangar for dirigible airships is being added to the four airplane hangars the company already has on its 80-acre aviation field, part of a 320-acre reservation, adjoining the new plant at the old Ascot race track. The flying field has been loaned to the city and is three-quarters of a mile long by half a mile wide. It will offer every facility for airmen to land and replenish their supplies. While the airship hangar will house any heavier-than-air balloon, it will be largely used for sheltering the new 95-foot "pony blimp" which the company exhibited at the recent San Francisco aero show. The manufacture of such dirigibles on a commercial scale will soon be part of the routine of the company's work. The first "blimp" will be used for the company's dispatches between here and Phoenix, Arizona, the center of the Goodyear cotton plantations.

Nelson & Price, Los Angeles, have taken over the distribution of India tires, made by the India Tire & Rubber Co., Akron, Ohio, for southern California and New Mexico.

The Ideal Rubber Company, formerly at 203 West 50th street, Los Angeles, has removed to 5019 Moneta avenue.

A decided advantage to present and prospective tire manufacturers in Southern California is expected through the operations of the newly-formed International Commerce Corporation, which intends to establish a direct shipping service between Los Angeles and the Dutch East Indies, as well as British India, New Zealand and Australia. The concern is well financed and has already set up agencies in twenty-eight American cities to look after exports and imports.

A concern starting under favorable auspices in the tire-selling line is the newly-incorporated Guasti, House & Giulli, Inc., with handsome salesrooms at 737 Terminal street, Los Angeles. The company has contracted with the Perfection Tire & Rubber Co., Fort Madison, Iowa, for an exceptionally large order of tires, thereby securing the sole agency for California and Arizona. The officers are: Secundo Guasti, Jr., president; Elliott M. House, vice-president, and Nicola Giulli and William Dobson, treasurer and secretary, respectively.

In addition to F. A. Seiberling, president of The Goodyear Tire & Rubber Company, Akron, Ohio, three other directors of the company are in Los Angeles studying the new plant. They are: George M. Stadelman, chief of sales; F. H. Adams and H. B. Manton. The Goodyear "Flying Squadron" of 110 experts is due in Los Angeles May 15 to give the big concern a proper start. It will be headed by C. R. Langdon. C. C. Slusser, manager of the personnel department, will come to assume the factory management, while Herman Barron of the Akron organization will be California division superintendent.

F. A. Seiberling, president of the Goodyear Tire & Rubber Co., Akron, Ohio, recently spent a week in Los Angeles. He came especially to attend the convention called to urge the development, with Federal aid, of the Colorado river water power project. He also noted with much satisfaction the work being done on the company's mammoth tire plant here and was confident that actual manufacture could be started in June.

F. A. Osterloh, Jr., of the Goodyear Tire & Rubber Co. of California, Los Angeles, has just returnd from a month in Phoenix, Arizona, where he was looking after the Goodyear interests in the cotton-growing belt.

The Miller Rubber Co. of California, formerly located on Pico street, has moved to its new home at 1233 South Hope street, Los Angeles, where it is said to have one of the best-equipped tire sales and storage establishments on the Pacific coast.

The J. B. Wood Tire Co., Hewitt tire and tube distributers for southern California and Arizona, is temporarily located at 464 East Third street, Los Angeles, pending the building of its new quarters at Third street and Central avenue.

Work on the forty-acre plant of the Goodyear Textile Mills Co., adjoining the Goodyear Tire & Rubber Co.'s tire plant now in course of erection at Ascot Park, Los Angeles, is progressing so well that the company expects to operate it in July. The textile factory will run 33,000 spindles in making about 150,000 yards of cotton fabric a week, all of which will be taken under contract by the Goodyear tire concern. The latter has covenanted with the textile company to operate a plant that will turn out a minimum of 3,000 tires a day to supply the demand west of the Rockies.

The Los Angeles Horseshoe Tire Co., of which Charles Daley is manager, and which is the sole distributer for the Pacific Rubber Co. here, has moved into new quarters at 1037 South Figueroa street.

Nelson & Price, Inc., has been appointed Los Angeles distributer of the products of the India Tire & Rubber Co., and will be assisted by Bert Mooser.

SAN FRANCISCO NOTES.

Among the speakers at a dinner given by the Advertising Club at the Palace Hotel, San Francisco, recently were A. H. Kroh, Goodyear Tire & Rubber Co.; Barney Oldfield, Oldfield Tire Co.; and C. F. U. Kelly, former president, Kelly-Springfield Tire Co.

The recent big automobile show, the finest ever held in San Francisco, has resulted in greatly stimulating sales of tires and accessories. Every exhibitor reports a quickened state of trade, and all declare the sales prospects for 1920 very encouraging. There were some 80 exhibits of tires, vulvanizers and accessories.

The National Aeronautic Exposition was held in the Exposition Auditorium, San Francisco, April 21-28, 1920.

The Power Rubber Co., San Francisco, distributer of Racine tires for northern California, and of which James E. Power is the head, is erecting a new building. The company has just opened a new salesroom in Fresno, and has branches in Oakland and San José as well as a dealers' organization for other coast cities.

Thomas F. Minehan, who has been in business on Market street, San Francisco, for fourteen years, has been appointed distributer for products of the Lehigh Tire & Rubber Co.

Complete success marked the first annual Pacific Coast Automotive Equipment Exposition which was held in the Civic Auditorium, San Francisco, and which closed on the 4th of April after running a week. Over 5,000 dealers from all parts of the West had exhibits of some sort, and the big eastern concerns were also well represented. One of the striking features was a model tire repair and vulcanizing shop in charge of George Parker, who, with assistants, gave lessons day and night in tire repairing.

The West Coast Rubber Co., San Francisco, of which Charles Williamson is sales manager, has taken the agency for west of the Rockies for the Bonner inner tubes made by the Story Rubber Corporation, of New York City.

A branch of the Braender Rubber & Tire Company, Rutherford, New Jersey, has been opened at 131-133 Eighth street, San Francisco.

NORTHWESTERN NOTES.

Automobile tire dealers in the Pacific Northwest are taking a lively interest in the plans for the great motor caravan wherein delegates from the advertising clubs of that section will move to the place of their annual convention in Stockton, California, on the 23d of May. It is expected that 500 will be in the party, which, it is said, will be the largest that has ever toured over the highways of the Pacific Coast states. L. J. Sparks, manager of the Portland, Oregon, branch of the Firestone Tire & Rubber Co., will have charge of the entries in the "ship-by-truck" class. George Bellis, district manager of The Goodyear Tire & Rubber Co., also of Portland, is general chairman of the program of "stunts" to be put on at various places. The caravan will start May 17 at Vancouver, British Columbia.

The Washington Tire & Rubber Co., Spokane, Washington, which started business in May, 1919, reports gross production to December 31 as $243,806, representing an average of 51 casings and 59 tubes a day. Production is now running at close to 150 casings and 200 tubes daily, it is said; and a business of $1,200,000 is expected this year. On March 3, the following officers and trustees were elected: John B. White, president; J. L. Bowling, vice-president; H. S. Burdick, secretary-treasurer; trustees—R. B. Paterson, G. A. Laudenbach, J. W. Brett, and Fred B. Grinnell. The sales and advertising department is under the management of W. H. Heylman.

Ray & Smith, of 70 Sixth street, Portland, Oregon, have been appointed state agents for the Sterling Tire Corporation, Rutherford, New Jersey.

The United States Rubber Co.'s new location in Portland, Oregon, is at 111-115 North Sixth street, where its building 100 by 125 feet gives it approximately 75,000 square feet of floor space, of which 5,000 square feet are used for offices, sample and shipping rooms, service department, and mechanical stock. The upper floors are used as stock and storage rooms for tires, tire sundries, footwear, clothing, and druggists' sundries.

E. H. Cummings and P. J. Carson have opened a tire store at Broadway and Flanders street, Portland, and will handle Firestone products.

W. L. Powell, Broadway and Glisan street, Portland, has taken the Mulnomah County agency for Hood tires.

The Portland Rubber Mills, Portland, Oregon, were incorporated in the autumn of 1912 with a capital of $25,000, by J. Spencer Smith, H. C. Huntington and G. C. Frisbie, the capital being increased to $40,000 four years later. The factory is of concrete, 200 by 75 feet and cost $100,000. The company manufactures mechanical goods, chiefly valves, gaskets, bumpers, sheet packing, and special molded goods. It specializes in heels

PORTLAND RUBBER MILLS, PORTLAND, OREGON.

and soles, having a capacity of 10,000 pairs of heels per day, with a very large output of soles and taps. This part of the business is confined to the Western States. The company is also the northwestern representative of the Manhattan Rubber Manufacturing Co., Passaic, New Jersey, and also does an extensive jobbing business with the saw mill trade. H. C. Huntington has been president and general manager of the company from the start.

F. L. Hawley has been made sales manager for the Pacific Tire & Rubber Co., Portland distributer of Blackstone fabric and Canton cord tires. R. Jansberg and C. H. Kepler have joined the sales force.

CANADIAN NOTES.

R. Jeffers has been appointed vice-president and manager of the Firestone Tire & Rubber Company of Canada, Limited, Hamilton, Ontario.

The Bergougnan Rubber Corporation, Trenton, New Jersey, U. S. A., some months ago opened a branch at 496 Yonge street, Toronto, Ontario, in charge of William A. Shaw as manager for the Province of Ontario.

The Rubberset Company, Newark, New Jersey, U. S. A., which established a manufacturing plant in Toronto, Ontario, about four years ago, to supply the Canadian trade demand for "Rubberset" brushes, has acquired a wood-working factory at Gravenhurst, Ontario, to meet its requirements in the way of handles for various kinds of brushes. Suitable machinery will be installed and about fifty people will be employed. Any surplus production will be used in the Newark factory. The company's Canadian branch now employs about 100 people and has established general distribution of its product throughout Canada.

The Lion Tire & Rubber Co., 502 Kent Building, Toronto, Ontario, has been recently incorporated under the laws of that province to manufacture cord tires and other rubber products. A factory site of more than five acres has been purchased in New Toronto, about five miles west of Toronto, where the first factory unit will be built at an estimated cost of $500,000. It is expected that manufacturing will begin about March, 1921. The company is capitalized at $2,500,000 common stock, par value $10 per share. It has also been granted a bond issue of $750,000, but does not plan to avail itself of this at present.

William Fifield has recently taken charge of the automobile inner tube production of Ames Holden McCready Co., Montreal, Quebec.

BILLIARD ACCESSORIES OF RUBBER.

Not content with supplying the greatest improvement ever made in billiards—the resilient ledge or elastic cushion surrounding the slate bed of the table, the one feature which has made the modern game possible—india rubber has provided devotees of the game with numerous accessories, most of which are quite indispensable. Not the least of these is the rubber-backed cloth which is largely replacing the old-time broadcloth. This cloth is now made in America and equals the best produced in Europe. It has a fine, close weave, with nap and finish to suit the most critical player, and it is made in various thicknesses to suit the different types of tables, as well as being woven to three sizes of beds. Even special care has been taken in dyeing in order to produce not only the standard blue-green color easy for the eyes under electric light, but also giving an effect that will harmonize with modern room-lighting. This material costs somewhat more than the old-fashioned billiard cloth, but this is more than offset, it is said, by its remarkably long wear. Moreover, skilful players note a decided advantage in having a slight cushion between the slate and the cloth. They say that with it shots can be made with much more accuracy than on the old, deader surface.

RUBBER CUE GRIPS.

To keep cues from slipping, the butts have been covered with cork, leather, twine, and silk and cotton braid, but players have found an excellent substitute for all these in a rubber cue grip, or sleeve, nine inches long, which will quickly transform any common cue into a perfectly non-slippable one.

RUBBER NOISE SUBDUERS.

The annoyance of cues bumping on floors is now easily overcome with rubber noise-subduers, one style being made with a nail attachment and a larger one, with an opening for a countersunk screw.

RUBBER TABLE COVERS.

Rubber-coated table covers are largely used now instead of oilcloth covers, as the paint-like coating on the latter soon cracks in handling and exposes the thin fabric through which dampness in inclement weather reaches the tightly stretched cloth on the table bed. This cloth readily absorbs moisture, offering greater resistance to the cue ball and requiring more force to drive it to an objective point.

HARD RUBBER BALLS.

Billiard balls of hard rubber are now being used instead of the more expensive ivory spheres. An infinite number of tests have proved them not only much livelier but also much more durable than the old-style composition balls.

BILLIARD MARKERS OF RUBBER.

In up-to-date billiard rooms wooden buttons suspended on a wire above the table are giving way to the neater and indestructible hard rubber markers. The latter are also used now on marker stands and frames, preferred by many to the old and often unhandy overhead counting device.

HARD RUBBER TRIANGLES.

With the passing of the old "pool room," to which more or less odium was attached, has come the "pocket billiards parlor." Here again rubber serves the players' needs in providing ebonite triangles to take the place of the maple ones so long used to arrange the fifteen balls in a pyramid. The hard rubber triangles have extra strong reinforced corners and users find they stand harder handling than the wooden contrivances.

RUBBER CEMENTS.

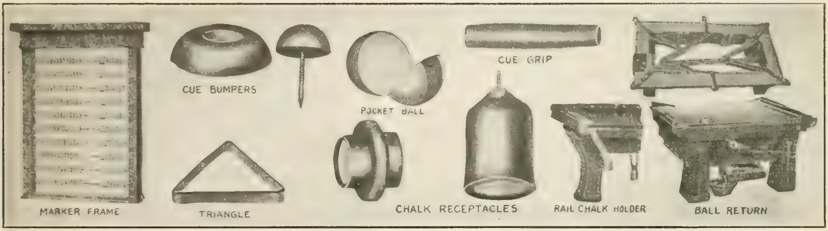
One of the least costly and most useful articles to the billiardist is rubber cement for attaching cue tips, etc. This article is put up in small tubes, and is much superior to glue preparations. Many players who want quick repairs find much satisfaction in using rubber cemented cue tips, which can be had in every size.

POCKET NET RINGS.

Pocket nets now have rubber rings instead of wood to lessen noise and ease the fall of balls. Careful players find that this simple precaution adds to the life of the balls and helps to keep them true.

RUBBER CHALK HOLDERS.

Much satisfaction is derived by knights of the cue from the rubber chalk receptacles. These holders are made in the round form only, one style being open at one end and the other open at two ends. They hang on weighted cords like other holders, either from above the table or on an under-rail frame.



Hard and Soft Rubber Specialties That Are Indispensable in Billiards.

FOR BALL RETURN.

Among the drawbacks of the original ball return device used beneath the table for pocket billiards were the noisy troughs or runways. Here again rubber proved to be a boon. It was placed in the troughs and all click and clatter ceased as the balls were holed and guided to the receptacle at the end of the table.

CORRUGATED MATTING.

A strong demand has developed for corrugated rubber matting beneath and around billiard tables. Not only are the looks of the table improved with such floor covering, but the firm yet elastic surface of the matting adds much to the comfort of players and lessens fatigue in long games. The ribbed matting is ⅛-inch thick and mitered at corners. It is made in nine sizes.

OTHER RUBBER SUPPLIES.

Other accessories in rubber include cushion packing facings for pocket openings in sets of twelve, tubing for cue roque table posts, and corrugated rubber mats for cuspidors.

The Research Association of the British Rubber Tyre Manufacturers has elected B. D. Porritt as its director.

Activities of The Rubber Association of America.

EXECUTIVE COMMITTEE TIRE MANUFACTURERS' DIVISION.

THE REGULAR APRIL MEETING of the Executive Committee of the Tire Manufacturers' Division, held in the Association rooms April 21, was well attended. Particular interest centered about the discussion of the subject of establishing minimum and maximum cross section widths for pneumatic tires, and to enable the subject to be thoroughly covered in both its commercial and technical phases, a conference had been arranged by the Executive Tire Committee with the Executive Committee of the Tire and Rim Division of the Society of Automotive Engineers. A lengthy discussion of several suggestions respecting the way in which to accomplish this end which seems to be the desire of all manufacturers, resulted in no definite recommendation and the subject was given to a special sub-committee appointed at the meeting, that will make a detailed study and report to the Tire Executive Committee at its next meeting. Several matters of a routine nature were also given attention by the Executive Committee.

MECHANICAL RUBBER GOODS SPECIFICATION COMMITTEE.

On April 2 there was held in the association rooms a meeting of the Mechanical Rubber Goods Specification Committee at which a large number of subjects connected with the negotiations of the Specification Committee with users of specification mechanical rubber goods was handled.

The work on these problems was principally of a routine nature, but definite conclusions were reached with respect to some matters, principal among which is the decision to recommend to all manufacturers of mechanical rubber goods that bids on M. C. B. air brake hose be confined to the 1913 M. C. B. Specifications as last amended by the Manual of Standard and Recommended Practice of the Master Car Builders' Association, for 1919. It is to be understood distinctly, however, that the foregoing has no application to car signal hose which may be furnished to a railroad's individual or any other specifications.

The committee felt also with respect to the matter of inspection and tests for rejection of specification mechanical rubber goods, that it should recommend to manufacturers that the period for acceptance or rejection, upon test, shall be limited to 60 days from date of shipment. In this connection it was also decided to recommend further to manufacturers, that all specification rubber goods be tested for acceptance or rejection at the point of manufacture. It is planned for the Specification Committee to hold its next meeting in Asbury Park during the week of June 22.

UNIFORM BASIS FOR COMPUTING EXTRA CHARGE FOR MAKING RUBBER BELTS ENDLESS.

Some time ago the Executive Committee of the Mechanical Rubber Goods Manufacturers' Division recommended to belting manufacturers that they adopt a uniform basis for computing the extra charge for making belts endless, which has been very generally in effect, on the following basis:

For belting under 12 inches in width, 6 additional feet.

For belting 12 inches or more in width, 8 additional feet.

Recent examination of the file on this subject indicates that acknowledgments from all interested companies approving the recommendation of the Executive Committee have been received and manufacturers have been so advised. This should insure uniform conditions in the rubber belting manufacturing business in this connection.

FUNDAMENTAL PRINCIPLES RELATING TO INDUSTRIAL RELATIONS.

New York, April 14, 1920.

To firm and affiliated members:

Please refer to our Circular Letter G-43 of March 19, announcing the distribution by the Republican National Committee, through its Advisory Committee on Policies and Platform, of a questionnaire on industrial relations and the problems of capital and labor. At that time we advised that because of the broad questions of industrial relations policy and practice involved, the Industrial Relations Executive Committee of this Association would give consideration to the specific questions set forth in the questionnaire with a view of making an analysis upon which it might predicate helpful information and suggestions to be offered to our members for consideration by them in connection with the questionnaire.

The Industrial Relations Executive Committee of the Association recently met and made an exhaustive examination and study of the questions presented in the questionnaire, and we are sending you with this letter a pamphlet entitled "Industrial Relations," in which there is set forth all of the questions contained in the Republican National Committee's questionnaire and there is shown in italics the views held by our Industrial Relations Executive Committee.

The committee wishes to be clearly understood respecting its purpose in making an analysis of the questionnaire. It desires to place particular emphasis on the fact that the political origin or purpose of the questionnaire had no place in the consideration of this matter and that it is not sent to you as an aid to political thought or action, but is intended to be non-partisan and non-political and is presented for the single purpose of offering to our members the benefit of the conclusions of experienced and practical minds in our industry who are giving all their time and energy to one of the most important problems in industry, namely, industrial relations.

The Republican National Committee's questionnaire presented questions respecting industrial relations which include nearly the whole range of fundamental principles relating to this important problem of our industrial life and had these questions originated with another political party or with other representative and responsible sources that would insure a wide distribution, our Committee would have felt that it was not meeting its duty if it did not attempt a conservative analysis for the purpose of offering assistance to the membership of this Association.

There is no doubt that each of the principles connected with the questions and suggested answers set forth in the attached pamphlet would have received attention by your Industrial Relations Committee in due course and it is perhaps fortunate that so complete an analysis of these primary principles of Industrial Relations can be made at this time in order that our members may clearly understand the viewpoint of the Industrial Relations Executive Committee which is predicated on the broad experience of its members in industrial relations work in the rubber industry.

The Committee hopes that its suggested answers to the questions set forth in the Republican National Committee's questionnaire may be of some assistance to those of our members who desire to respond to the questionnaire, but the primary purpose of distributing the attached pamphlet is to suggest to our members basic principles for conducting industrial relations work and to indicate the composite opinion of your Industrial Relations Executive Committee respecting those principles.

A. L. VILES, General Manager.

ANNOUNCEMENT BULLETIN AND INFORMATIVE SERVICE.

New York, April 22, 1920.

To firm and affiliated members:

This is the first of the bulletins which members of this Association will receive under an extension of the bulletin service heretofore conducted by this office to a limited extent through

the medium of circular letters.

Distinctive bulletin forms printed in colored inks will be used to cover the dissemination of information for the present under the following classifications:

General information,
Traffic information,
Legislative information,
Industrial relations information.
Bureau for the exchange of mill information (surplus new and second-hand material and equipment for sale and purchase).

The bulletins of each class will be numbered consecutively and will be issued as frequently as is necessary.

May we not suggest that provision be made in your office for filing these bulletins according to the classification indicated, thus building a convenient means of reference to the information emanating from the Rubber Association. An index to the numbered bulletins will be issued at frequent intervals, to expedite reference to them. A. L. VILES, General Manager.

PERSONNEL OF ASSOCIATION STAFF.

New York, April 26, 1920.

To members:

The following promotions in the staff of the Association, effective as of April 1, have been approved by the Board of Directors:

Harvey Willson, formerly assistant secretary and office manager, is promoted to the newly created position of assistant general manager.

R. H. Goebel, formerly assistant to the manager of the traffic department, is appointed manager of the traffic department.

A. L. VILES, General Manager.

NEWS TICKER SERVICE FOR THE RUBBER TRADE.

The Export and Import News Bureau, 24 Moore street, New York City, which several months ago began the operation of a foreign trade news ticker, will shortly establish a separate ticker unit devoted exclusively to the rubber trade. The Bureau will have daily cables from London, Singapore, Colombo, Batavia and other foreign markets. Consular and trade representative reports as well as other Washington news, legislative and administrative, of interest to the trade will be secured by private wire from the Bureau's Washington office. Imports at the port of New York in detail as well as steamship arrivals will be promptly bulletined.

The New York market on crude rubber of all grades, spot and future delivery, will be covered both by quotations and by bids and offers of subscribers for the ticker service. Over forty rubber dealers, brokers and importers have contracted for the service and are given the privilege of telephoning in at any time during the day to have announced on the ticker what they want to buy or sell. The subscriber does not have to use his name unless he chooses, as he can have assigned to him an office designation, as X-27 and then all replies coming to the office of the Bureau are promptly telephoned him.

The foreign exchange market will be covered very comprehensively. Continuous quotations on cable sterling will be published and twice each day, at noon and closing, the prices, never published heretofore, will be given on forward sterling by months, for nine months in the future.

An interesting feature of the Bureau's foreign quotations on crude rubber will be their translation into New York parity at the current rate of exchange. For example, if crêpe is quoted in London at 26*d.* and cables are £3.97, the announcement on the ticker would be, "London 1 p. m., crêpe, 26*d.*, New York parity 43 cents."

To serve out-of-town subscribers as well as those in New York, quotations, bids, and offers of fabrics and chemicals used by rubber manufacturers will be published. To the out-of-town subscribers the Bureau will send telegrams as often as there is any change in the market, covering both the New York quotations and foreign cables as received, and the out-of-town subscriber by using the wire can have his announcements made on the ticker as well as the New York subscriber.

THE ADVERTISING MANAGERS' COUNCIL.

More than fifty representative advertising managers of the automotive industries attended a meeting at the Hotel Commodore, New York City, March 26, 1920, under the auspices of the Motor and Accessory Manufacturers' Association, and approved plans for the organization of an advertising managers' council, as a central clearing house to handle constructive cooperative work on vital problems of mutual interest.

Among those present were: E. C. Tibbitts, advertising manager, The B. T. Goodrich Co., Akron, Ohio; M. S. Connelly, advertising manager, Hood Rubber Products Co. Watertown, Massachusetts; M. F. Judd, sales manager, R. B. Davis, district manager, and J. E. Elliott, Raybestos Co., Bridgeport, Connecticut; George B. Hendrick, publicity manager, The Fisk Rubber Co., Chicopee Falls, Massachusetts; H. B. Joseph, assistant advertising manager, and H. R. Hurd, manager copy division, Kelly-Springfield Tire Co., New York City; L. L. King, advertising manager, The Goodyear Tire & Rubber Co., Akron, Ohio, and J. C. McQuiston, advertising manager, Westinghouse Electric & Manufacturing Co., New York City.

At the luncheon which preceded the executive session of the conference, addresses were delivered by Richard H. Lee, special counsel of the Associated Advertising Clubs of the World, and David Beecroft, directing editor, Class Journal publications.

E. C. Tibbitts, advertising manager, The B. F. Goodrich Co., Akron, Ohio, pleaded for a broader vision by advertising men in meeting the complex and crucial problems facing America. It is the special privilege and duty of advertising men, he said, to render patriotic service of the most vital importance by supporting the various movements for Americanization, greater production, and better roads and transportation. He urged the advertising managers to think, not only of their own particular problems in marketing and selling their products, but also to enlist their talents and their services in the interest of the larger national movements. This can best be done, he said, through concerted action and team-work.

S. A. E. SUMMER MEETING.

The Society of Automotive Engineers will hold its summer meeting this year at Ottawa Beach on Lake Michigan, June 21 to June 25 inclusive. The Ottawa Beach Hotel and the Waukazoo Inn have been engaged for the members, and arrangements have been made for the accommodation of ladies. There will be daily lectures and business meetings, a program of sports spread over three days, and a grand ball on Thursday, June 24. Ottawa Beach is at the junction of Black Lake with Lake Michigan, six miles from Holland, Michigan, and can be reached from Chicago by boat and by train.

RUBBER GOODS BOUGHT BY THE QUARTERMASTER'S DEPARTMENT.

In the year and a half since June 1, 1918, the General Supplies Branch of the Quartermaster General's office has bought the following rubber goods:

Rubber bands, 6,696 pounds, @$1.1308 *per pound*	$7,572.50
Rubber erasers, 25,336, @ $0.0[illegible] *each*	507.02
Rubber matting, 864 yards, @ $1.017 *per yard*	878.99
Cuspidor mats, 1,500, @ $0.245 *each*	368.75
Floor mats, 11, @ $20.5175 *each*	82.07
Treads for stairs, 90 pieces, @ $0.751 *per piece*	67.60
Finger cots, 250 dozen, @ $0.42 *per dozen*	105.00
Rubber type, 100 sets, @ $0.65 *each*	65.00
Total	$9,646.93

The Rubber Trade in Great Britain.

By Our Regular Correspondent.

Business in practically all departments of the trade continues to be brisk enough as far as the order book is concerned. This, however, does not mean that everything is proceeding smoothly and that there are no worries to contend with. In fact, if all troubles were enumerated it would form a long list, what with labor demands for higher wages and shorter hours, the rise in the price of textiles, transport difficulties, etc., to say nothing of the impending levy on war wealth. Judging by resolutions recently adopted by certain workers' unions it would seem that the day wage in most industries will be replaced by the piece-work system. This should tend to increase output, which on the day wage system usually remains at the level of the slowest worker.

This year has been remarkable for the appeal to the public to invest in all sorts of industrial concerns which, owing to the increased expense of commodities and wages, require a larger capital to carry on. To date—the middle of March—there has been an issue of about one hundred millions, of which about fourteen million pounds was for the rubber trade, including eight millions issued by the Dunlop Rubber Co., Limited. Underwriting has been easy to obtain as the public seems prepared to go in for everything which offers. This pace, however, cannot be kept up and we may expect to see a considerable slowing down.

THE PROOFING TRADE.

The use of coal tar products as petrol substitutes is on the increase, owing to the rise in price of petrol, and the solvent naphtha position is causing perturbation in the minds of proofers. So far, not much has been done in the way of installing recovery plants, but engineers are quite alive to the possibilities in this direction and a good many specifications are now before proofing firms. Of course the initial expense is now somewhat heavy and, moreover, specifications and estimates are not worth much nowadays, as they all contain clauses to the effect that extra may have to be charged if materials and labor go up before the work is completed. However, the matter of the installation of recovery plants is receiving more serious attention now than has ever been the case in the history of the proofing trade.

Now that business has got back into normal channels there is plenty of competition for the work given out and proofers are not finding it too easy to get customers to agree to the high prices now ruling on account of the increased costs of materials, except rubber. Many firms are still busy on old contracts, and where they have covered themselves for cloth they are all right and are, of course, in a very good position if they have excess cloth in stock at old prices. Those who have to buy their cloth at to-day's prices can only compete with the utmost economy in other directions, hence they do not turn a deaf ear to the advocates of naphtha recovery. The rain coat business is decidedly flat and in some cases where there is a stock of cloth rain-proofed but not cut up, it is being turned over to the proofers to be rubbered where they are found willing to take the business on.

DETERMINATION OF SUBSTITUTE IN RUBBER.

A communication on this subject has recently been published by P. Dekker, of the Netherlands Government Rubber Institute, at Delft. There will be many rubber analysts who will agree with his statement that the determination is by no means so easy as is often supposed. One cause is the incomplete abstraction of the substitute by alcoholic potash, and another is the fact that substitutes have varying composition, this being more pronounced to-day than it was ten or twenty years ago. It should be noted that the alcoholic potash extraction test, as laid down in British Government specifications, is not a process for the estimation of substitute so much as the determination of organic matter not rubber, and as the acetone extract is also taken into account it does not matter if 50 per cent of the substitute goes into the acetone extract. In the case, however, of a commercial analysis, where the object is to ascertain the amount of substitute used, the proportion soluble in acetone is of prime importance. No recognized correction can be made for this, as the amount soluble in acetone varies within such wide limits. Especially is this the case with brown substitutes containing non-oily matters, such as paraffine wax. Mr. Dekker experimented with a brown substitute containing 38 per cent soluble in acetone. In my experience the figure has varied from 15 to as high as 70 per cent, though the latter figure may be considered as exceptional.

An interesting part of the paper refers to the determination of substitute in the presence of asphalt, and it is shown that the varying amounts of asphalt dissolved by acetone and alcoholic potash entirely vitiate any attempt to gage the amount of substitute dissolved by the same solvent and the author comes to the conclusion that the determination of substitute is not feasible in rubber compounds containing asphalt. As the two are but rarely to be found in the same rubber compound, the matter is not of great importance.

The method he advocates for determining substitute in rubber is to add to the alcoholic potash extract the acetone extract minus rubber resins and sulphur, and to call the combined extract substitute. The chief draw-back to this conclusion seems to be in the fact that where paraffine wax is present it is impossible to say whether it was used in addition to the ordinary quality substitute or whether it formed a component part of the substitute. Of course, if only the fatty acid, dissolved by alcoholic potash and the fatty portion of the acetone extract are added together and returned as substitute, a correct figure is obtained for substitute as commonly understood, but not necessarily for the commercial substitute as used by the rubber manufacturer in his formula.

PEACHEY'S NEW VULCANIZATION PROCESS.

Peachey's process has been patented for most parts of the world, the British patent being No. 129,826,[1] and its exploitation is in progress by strong financial interests in England. It certainly does not lack the element of novelty as so many rubber patents do, and its advent cannot fail to excite great interest among rubber chemists and manufacturers. Stated briefly, the vulcanization is effected by sulphur without the aid of heat, and therefore certain organic fillers and a wide range of coloring matters, the use of which has hitherto been barred, may be utilized in vulcanized rubber goods. The sulphur is got into the rubber by employing the well-known inter-action of sulphureted hydrogen and sulphur dioxide gases, which leads to the formation of free sulphur. Rather surprisingly, this sulphur acts upon the rubber to vulcanize it in the cold. If a solution, say a 10 per cent solution of raw rubber in benzene, is saturated with sulphur dioxide and is then mixed with another similar solution saturated with sulphureted hydrogen, a jelly is formed after the lapse of a short time and on evaporation of the solvent the rubber is found to be well vulcanized.

[1]This patent was briefly described under "Chemical Patents" in The India Rubber World, November 1, 1919, page 86.

This is the main outline of the reaction without reference to certain details which must be attended to in order to produce a uniform rubber. The process obviously opens up a vista of possibilities in one branch or another of the rubber trade. One branch which is very much to the fore at the moment is the production of compound rubber soles for boots, and here, I am credibly informed, some very good and quite cheap material has been turned out by aid of the new vulcanizing process. Moreover, the soling material already cold cured is readily vulcanized on the boot by means of the rubber solution with the mixed gases in it, thus obviating the use of nails. There would certainly seem a wide and useful field for the process in connection with the use of organic materials such as sawdust in cheap mixings or in utilizing the process in bodies such as linoleum, where the presence of a little vulcanized rubber might well be expected to be of benefit and where the employment of the ordinary hot sulphur cure would be out of the question.

It will be interesting to watch the development of a vulcanizing process which may fairly be considered the only one which has any serious claim to consideration since the distant date of 1846 when Parkes brought out the present-day cold cure process. It is somewhat unfortunate that it seems to be the fate of cold-cure processes to be concerned with atmospheres which—well, are not in the same street with attar of roses, but still a new smell in a rubber works will not suffice in itself to destroy interest in a process which has merit behind it, and really, as far as I know, the smell vulgarly associated with election eggs may not make itself evident to the senses.

TIRES FOR TRUCKS.

A development which is attracting a good deal of attention has to do with the extended use of pneumatic tires on heavy commercial vehicles. At present from the two-ton vehicle upward the solid tire is practically the standard. There is an insistent demand, however, in many classes of traffic for freedom from road shocks, and there is also a call for less damage to the roads, and because the pneumatic tire is the best shock absorber it is felt that its upward development into the region of the heavier commercial vehicle is bound to materialize. The big pneumatic is not now entirely a novelty because it has been put to practical test in aviation, for the landing wheels of the giant airplanes used in the war. Personally I have made acquaintance with these tires only on the rubber reclaimer's premises, but it is understood that the special plant which turned them out is still in existence, although the specialized demand has ceased. Should a new demand arise in connection with commercial vehicles, no doubt the supply would soon be forthcoming. Meanwhile the number of rubber firms putting solid tires on the market continues to increase.

BRITISH RUBBER EXHIBITION—1921.

The Fifth International Exhibition of Rubber, Other Tropical Products and Allied Industries will be held at the Royal Agricultural Hall in London, June 3 to June 17, 1921. The organizing manager is H. Greville Montgomery, formerly Member of Parliament for the Bridgewater division, of Somerset, who takes the place of the lamented A. Staines Manders, the founder of these exhibitions. Sir Owen Philipps, G.C.M.G., M.P., will be honorary president and Prof. Wyndham R. Dunstan, L.L.D., F.R.S., director of the Imperial Institute, honorary vice-president; Miss D. Fulton, secretary of the late Mr. Manders, and Miss Edith Browne, F.R.G.S., are interested in the enterprise. On the Executive Committee are Dr. Joseph Torrey, who will again act as chairman of the congress; the Right Honorable Lord Leverhulme; Sir Harry Wilson; Sir Daniel Morris, D.C.L., D.Sc.; Sir Francis Watts, D.Sc., and others prominent in the rubber industries. The advisory council is drawn from officials in all tropical countries.

The offices of the organization are at 43 Essex street, Strand, London, W.C.2.

PROWODNIK REPORTED TAKEN OVER BY BRITISH CAPITAL.

In the rush to secure Russian markets British capital is anticipating peace settlements and the recognition of whatever government Russia may have, and has already invaded the new countries that have been formed from former Russian territory, Letvia, Lithuania and Esthonia. A powerful British group of capitalists is reported to have made arrangements with the authorities in these lands to handle their natural resources and industries. Among these it will reconstruct at once the works of the Prowodnik at Riga.

The Prowodnik, the full name of which is "The Prowodnik Russian-French India Rubber, Gutta Percha & Telegraph Works," was the largest rubber goods factory in Russia, and came into existence about 1889, French capital being employed. In 1916 when the German advance brought about its removal to Moscow, the company had a capital of fifty million rubles; its plant covered 3,000,000 square meters of ground; it used 20,000 horsepower in its engines; and the number of employes was 18,000. It made every kind of rubber goods, turning out 1,000 tires and 100,000 pairs of rubber shoes a day and doing 65,000,000 rubles worth of business a year.

The removal of the plant to Moscow was regarded as a wonderful feat of efficiency. Reports came at that time that the company had been nationalized, together with the other great company, the Treügolnik or Russian-American which, with it, monopolized the Russian rubber trade and, before the war, was mainly run by German capital. It is the plant abandoned in 1916 that the British capitalists are said to have taken over.

TARIFF REGULATIONS AND CHANGES.

Greece proposes to put a duty on "metallic wires covered with rubber or gutta percha," at the rate of 10 drachmas per 100 okes or 19.2 cents on 280 pounds.

Brazil imposes an export duty of 3 per cent ad valorem on rubber exported after June 1, 1920.

Latvia imposes duties of 5 per cent ad valorem on crude rubber and of 15 per cent on manufactured rubber goods.

Persia imposes duties of 12 per cent ad valorem on rubber manufactures.

Switzerland intends to exact duties of one franc on a hundred kilos of crude or waste rubber or gutta percha and of five francs per hundred kilos on threads of rubber for elastic tissue, which have heretofore been admitted free of duty.

According to the proclamation in the *"Reichsanzeiger"* of March 6, 1920, no license is required for the importation into Germany of india rubber, raw or purified; gutta percha, raw or purified; balata, raw or purified; india rubber, gutta percha and balata waste; waste wares of india rubber, gutta percha and balata.

Switzerland exacts no individual export license since February 20, 1920, for rubber and gutta percha in bands, sheets, plates, plugs, molded articles, threads, balls, rods, etc., without internal layers of metals or tissues; plates, rings, strips, etc. of rubber, with internal layers of metal or tissues.

From October 20, 1920, for gummed fabrics of rubber for industrial use, rubber fabrics for cards, cylinder covers for printing, insulating materials of rubber; rubbered fabrics (double stuffs) for cart tilts, etc.; elastic tissues of all kinds, of rubber combined with cotton, wool, silk, etc.; rubber or gutta percha applied on tissues or other materials; waterproof sheeting, rubbered on one or both sides.

On the other hand the General Export License has been abrogated for mechanical stoppers of all kinds of bottles, including those combined with rubber.

ITALY'S RUBBER INDUSTRY.

By H. C. MacLean, in "Commerce Reports."

ITALY has built up a flourishing industry in the manufacture of rubber goods, although the number of firms engaged in this line of activity is not large. The first steps toward the establishment of this industry were taken in 1872 by G. B. Pirelli, and the progress made is very creditable, considering the technical character of the industry and Italy's deficiencies in the matter of coal, gasoline, etc. There are at present in Italy 13 firms engaged in the production of rubber goods and insulated electric wire and cables, which give employment to about 20,000 persons. During the past year these firms organized the *Associazione fra gli Industriali della Gomma, Conduttori Elettrici, ed Affini,* believing that they had certain interests in common which such an association could promote.

LARGE INCREASE IN IMPORTS OF CRUDE RUBBER.

The statistics covering Italian imports of crude rubber for the past 10 years show the extent to which the rubber industry has developed. The war created an exceptional demand for rubber goods. The consumption of crude rubber in 1918 was approximately five times as great as in 1909 and more than double that of 1914, the year the war broke out.

Crude-rubber imports for the years 1909-1918, inclusive, were as follows (one lire = $0.193):

Years.		Value, Lire.	Years.		Value. Lire.
1909 .... *tons*	1,567	20,376,000	1914 .... *tons*	3,054	21,378,000
1910 .... "	1,878	31,960,000	1915 .... "	5,367	42,938,000
1911 .... "	2,419	30,249,000	1916 .... "	5,320	47,878,000
1912 .... "	3,494	38,438,000	1917 .... "	6,127	67,399,000
1913 .... "	2,844	25,599,000	1918 .... "	7,545	83,000,000

PRINCIPAL ITALIAN RUBBER GOODS MANUFACTURING COMPANY.

Italy manufactures rubber goods of practically every variety, including tires, mechanical rubber goods, hard-rubber goods, druggists' sundries and other specialties, rubberized textiles, and

WORKS OF PIRELLI & CO., MILAN, ITALY.

insulated wire and cables. The firm of Pirelli & Co., whose head office is in Milan, is by far the largest manufacturer in this line. This company has a capital of 40,000,000 lire, and, in addition to its three plants in Italy, has also additional plants in Spain, England, and Argentina. During the year 1917 its Italian production was valued at 165,000,000 lire, which was an increase of about 80 per cent over that of the preceding year. While making a wide variety of articles, the most important products of the Pirelli company are pneumatic and solid tires and electric wire and cables, in which a considerable foreign business has been built up. Its foreign establishments are engaged principally in the manufacture of electrical conductors, including submarine cables, in which line this firm has been able to compete successfully with the large manufacturers of other nations. In addition to Pirelli & Co., other establishments of considerable importance are working along similar lines.

WAR-TIME DECLINE IN EXPORTS OF RUBBER GOODS.

Italy's imports of rubber goods have remained more or less stationary for a number of years, although during the last years of the war a considerable reduction took place. On the other hand, exports steadily increased until, in 1915, they were about two and a half times greater than the imports. After Italy's entrance into the war in that year the domestic demand was such that exports were greatly reduced, in spite of the large increase in production. As conditions become normal again there is reason to expect that exports will again increase, especially in the case of pneumatic tires, as this Italian product has won considerable popularity abroad. Statistics covering Italy's total imports and exports of rubber goods for the period 1909-1918 follow:

Years.	Imports. Lire.	Exports. Lire.	Years.	Imports. Lire.	Exports. Lire.
1909......	33,111,000	21,406,685	1914......	27,464,000	58,106,000
1910......	44,247,000	30,074,750	1915......	36,460,000	87,514,000
1911......	33,670,000	26,025,000	1916......	33,042,000	46,944,000
1912......	30,397,000	58,424,000	1917......	22,281,000	23,986,000
1913......	23,818,000	51,039,000	1918......	19,268,000	16,322,000

IMPORTS AND EXPORTS OF RUBBER GOODS FOR FIRST SIX MONTHS OF 1919.

From the figures for the first six months of 1919 an idea can be gained of the character of the rubber and rubber goods imported and exported by Italy. Unfortunately, the largest increase in imports is shown in the case of "other rubber products not specified," and there is no means of ascertaining what commodities are included under that head. On the side of exports, the most important item is pneumatic tires, where the 1919 figures are more than double those of the previous year, and exceed imports by about 4,000,000 lire. Statistics covering insulated wire are not available. The detailed figures of imports and exports of rubber and rubber goods for the first six months of 1919 are given below:

	Imports.		Exports.	
Articles.	Quantity.	Lire.	Quantity.	Lire.
Rubber and gutta percha, crude and reclaimed .... *tons*	7,048	67,274,550	362	1,316,800
Scrap	944	1,545,120	11	12,000
Rubber and gutta percha in:				
Threads	16	395,200	13	486,000
Sheets	10	161,600	5	93,000
Tubes	9	115,100	53	521,000
Belting	27	454,400	10	152,000
Rubberized textiles in the piece....	37	88,500	10	117,600
Rubber shoes	1,427	194,700	....	......
Elastic webbing	27	691,600	33	1,089,000
Garments and traveling equipment, *pounds*	440	6,400	880	19,200
Manufactures of rubber:				
Rubber sheets .... *tons*	2	53,200	5	130,000
Rubberized textiles	228	3,536,000	10	158,400
Pneumatic tires	331	7,663,200	667	11,534,900
Rubber goods not specified........	870	11,866,500	87	1,107,400

CHICLE IMPORTS FOR 1919.

The import trade in chicle increased greatly in quantity as well as value in the first year of peace, according to Commerce Reports. Mexico, the chief source, shows a gain in quantity of 1,891,307 pounds in 1919 over 1918 and in value of $1,791,107, while the other chicle countries show smaller gains. The average value per pound rose from 37 cents in 1914 to 65.8 cents in 1919, about 78 per cent in six years. The increase from the 52.6 cents per pound of 1918 was 25 per cent. The average import prices paid per pound in 1919, by countries, were: Canada $1.24, British Honduras $0.675, Mexico $0.74, Colombia $0.321, and Venezuela $0.285.

SUBSTITUTE FOR CHICLE.

The latex of the *Galactodendron utile,* a tree of Colombia, was examined by M. T. Dawe, of the London Imperial Institute, who found, after drying it, that it contained 90.8 per cent resin, 3.1 per cent impurities and 6.1 per cent gutta. The last was very soft and plastic. The substance is too friable and resinous to be used as balata or gutta percha are, but it strongly resembles pontianak. The latex differs from chicle because it contains more resin and less gutta, but it could easily be used for chewing gum, as it is pale in color, is free from bark and mineral matter, and becomes more plastic when it is chewed.

Rubber Plantations in Kamerun.

By Alfred Dominikus.

IT CANNOT BE DENIED that the Germans, in so far as conditions permitted, did their best to further the cultivation of rubber in their former African colonies which were taken away from them by the war, but that on the other hand, many disastrous mistakes and errors were made which prevented the expected successful results from the work. Consider for example, former German East Africa. Since the ground was not suitable for *Hevea brasiliensis,* the Ceara rubber tree (*Manihot glaziovii*) was cultivated in this district, but it cannot be said to-day that there was any special success in the cultivation which some years ago was stigmatized scientifically as a distinct mistake.

The English, who are masters of the colony they now call Tanganyika—that is to say, English companies such as East African Plantations, Lewa Rubber Estates, Kamna Rubber Estate, and the Muhesa Rubber Plantations—at the time of the rubber boom, with its deep shadows, took over the best *Manihot* plantations of what was then German East Africa without obtaining any better results.

A still more manifest failure can be recorded regarding the *Kickxia* (*Funtumia elastica*) plantations in Kamerun. When Dr. Schlechter, on the basis of the results from his West African rubber tree (1899-1900), praised the agricultural value of the *Kickxia* in the highest terms, designated the cultivation of this species as "extraordinarily profitable" and recommended it, especially for West Africa, "since it is native to the country, and therefore surely seems to offer better prospects for success than the various rubber trees of other portions of the world," it naturally resulted that the work of cultivating the native African rubber tree should be eagerly taken up in former German Kamerun. Dr. Schlechter had stated that a tree seven years old had given 3,400 cubic centimeters of latex, out of which 2,000 grams of rubber were obtained; also that trees not yet six years old had yielded 140 to 170 grams of dry rubber, from which he inferred that the trees could be tapped four times a year, and perhaps even more frequently with similar results. It was said in the prospectus for a plantation scheme, that *Kickxias* about fifteen years old gave on the average in the course of three years seven pounds of rubber per tree and per year. And what were the results of this Kamerun *Kickxia* fever?"

Information on this is given in an article by Heinrich Picht in the "*Tropenpflanzer*" for January and February, 1920, on the prospects of profits from some Kamerun plantations. As remarked above, and as Picht states in the introduction to his article, the *Kickxia* cultivation in Kamerun was taken up at the time with great hopes. From the quality of the rubber obtained

(*West African Plantation Co., "Bibundi," Kamerun.*)

FIVE-YEAR HEVEA BRASILIENSIS. MANIHOT GLAZIOVII. SIX AND ONE-HALF-YEAR KICKXIA.

and the reports of professed scientific men on the results, these hopes seemed to be thoroughly justified. Yet hardly any such tropical culture has brought on the bitter disillusions that *Kickxia* has! The author gives proof of this plainly from more definite statements of the results of tapping, which he caused to be made and could verify in part. The figures reported by Picht are given in the following table:

No.	Year.	Age of Trees. Years.	Total Number of Tappings.	Total Yield of Dry Rubber. Kilos.	Rubber Yield Per Tree and Tapping. Grams.	Rubber Yield Per Tree and Year. Grams.	Per Cent of Latex to Dry Rubber.
1	1911	5-7	214,298 (about half of the trees 2 x tapped)	16,929	7.9	11.7	30.0
2	1912	6-8	353,350 (part of trees 3 x tapped)	2,827	8.0		28.9
3	1913	6-10	194,755 (part of trees 3 x tapped)	1,316	6.7	21.1	22.6

Picht unfortunately can not give a reliable scale of crops; yet tree production increasing from the sixth to the tenth year from 10 to 50 grams seems to him attainable. When Preuss puts the yearly yield of a six-year *Kickxia* at 50 to 60 grams, that of a 15-year tree at 500 grams of rubber, his statements find as little support in the results reported in the article before us, as do the assumption of Schulte im Hofe that a tree with a trunk circumference of 50 to 55 centimeters will yield about 100 grams, or the crop estimates of the English investigator Christy, who assumes that the yield of five to ten-year trees increases from 85.2 to 426 grams.

At all events Picht believes, on the basis of his experiences

before the war, that it is useless to speak of profitable results from *Kickxia* in a tropical agricultural sense, but that at best we can consider only the value of the individual trees, which can be realized only on their being tapped to death, but which in comparison with the clearing necessary to open up a new form of cultivation amounts practically to nothing. This led one Kamerun planter in an excess of rage to set fire to his whole *Kickxia* possessions.

Thus, to use Picht's words, *Kickxia* was the most unpleasant chapter in the history of Kamerun plantation, and it must be looked upon as a great piece of good fortune that the amount of capital invested in this cultivation is comparatively small and that the estates, which at first turned extensively to *Kickxia,* for the most part were diverted at the right time to other cultures, so that the *Kickxia* portion in them sank to the rank of an unimportant side culture. Moreover, we should mention here what Picht does not state, that at the beginning great plots of *Kickxia* were planted which did not belong to the species *K. elastica,* but were obtained from specimens of the wholly valueless species *K. africana,* as was only discovered later.

In another article (*"Tropenpflanzer,"* January, 1920), Picht treats of the prospects of profits from the *Hevea brasiliensis* in Kamerun and forms a wholly different judgment. In view of the amazing profits obtained from the rubber plantations of Eastern Asia and of the increasing lack of confidence in the results of the *Kickxia,* the Kamerun planters turned to the cultivation of *Hevea.* After they had succeeded in obtaining *Hevea* stumps in large quantities from Eastern Asia and transporting them to West Africa, there was no difficulty in raising this tree, especially as the ground and the rainfall conditions in Kamerun were in every way favorable.

At the outbreak of the war large *Hevea* plots in Kamerun had reached an age that permitted tapping. Picht, who made a journey to Ceylon and the Straits Settlements in 1910-1911, was in a position to make comparisons between the growth of the *Hevea* there and in Kamerun. He was unable to see any difference. Later he was able, on the basis of experiments which were made on the plantations under his care, to give figures which allow safe inferences to be drawn on the profitable character of *Hevea* cultivation in Kamerun. He prints a table taken from the "Straits Times" on the average yield of *Hevea* of various ages, and then gives more detailed accounts of what the Kamerun *Hevea* yielded in comparison. The results of the figures follow:

No.	Age of Heveas. Years.	Number of Tappings (Renewed Cuts) Per Tree.	Rubber Yield Per Tree. Kilos.	Straits Figures for Comparison. Kilos.
1	6	[illegible]	[illegible]	0.725
2	5	[illegible]	[illegible]	0.35

The yields in Kamerun are, therefore, substantially greater than in the Straits, which is the consequence probably of the richer soil in Kamerun and the better rainfall condition there. It should be mentioned also that the above tappings were made with an extremely careful regard for the bark, such as has gradually been shown to be the best thing in Asia. *Hevea* in Kamerun is generally planted mixed with cacao—about 180 *Hevea* and 542 cacao trees to a hectare.

Picht presents more detailed estimates of profits and comes to the conclusion that in Kamerun, whose negroes have shown themselves to be an industrious and relatively cheap form of labor, *Hevea* cultivation should profit by the expensive experience gained in other countries, with results no less successful than in East Asia.

AFRICAN NOTES.

From the Gold Coast of Africa comes an interesting report of the Agricultural Department for 1918, which shows a steady purpose of building up again the rubber trade under discouraging circumstances. Less than ten years ago West Africa was exporting over 14,000 tons of rubber and seemed to have an even chance with the plantations of the Far East. The government keeps up nine agricultural stations which report on rubber cultivation. Those at Tarquah and Cormassie have 78 and 60 acres, respectively, devoted to rubber; the others are much smaller. On all, elaborate experiments are being made in tapping, in planting, in the distance from each other of the trees, and the diseases which seem to be unduly prevalent, are studied. Small farms, planted with rubber, are prepared for the natives, who cannot be made to take an interest in them; the white planters, too, care little for rubber.

The cause of the depression is ascribed to the war, but it is more likely due to the hopelessness of contending with the triumphant Asiatic plantation rubber. Still the statistics demonstrate that on the Gold Coast and in the surrounding territory the physical conditions for growing *Hevea* rubber, as well as that of the indigenous *Funtumia elastica* are very favorable, if the proper supply of labor can be obtained, and that England can fall back on these possessions for her rubber supply in case any political or other disaster were to deprive her of her East Indian and Malayan territories.

Exports from French West Africa, of which rubber forms an important part, were interfered with on account of the deficiency of vessels in the period following the armistice. The figures were:

	Pounds.	Value.
French Guinea	1,559,800	$683,730
Ivory Coast	547,800	240,406
Senegal	719,400	315,994
Totals	2,827,000	$1,240,130

In 1917, French West Africa exported 2,873,200 pounds of rubber, valued at $1,260,396. Only $5,734 worth of rubber from the Ivory Coast went directly to the United States.

SINGAPORE GUTTA PERCHA EXPORTS.

As an example of the upward tendency in the prices asked for gutta percha, it may be stated that "Pahang red," which five years ago cost approximately $158 per picul (133 1-3 pounds), rose to $312 at the close of 1919, with supplies even at this price practically unobtainable. Similarly, "Banjirmassin" increased from $85 to $142 during the same period, and this may be taken as a fair average of the advances made on all grades of gutta percha during the past five years. It will thus be seen that increases of 80 to 100 per cent have taken place.

Gutta percha to the amount of 1,469 long tons, valued at $1,468,792, was imported into Singapore during the year 1918. Of this amount 1,372 tons, at a value of $1,358,764, were imported from the Dutch East Indies, while only 91 tons, valued at $107,431, were imported from British North Borneo, Sarawak, and the Federated Malay States.

Of gutta inferior, 5,243 tons, valued at $518,975, were imported into Singapore during the year 1918, most of which came from Dutch Borneo and Sarawak, Sumatra furnishing only 300 tons.

The following table shows the quantities, values, and countries of destination of gutta percha and gutta inferior exported from Singapore during 1918:

GUTTA PERCHA.

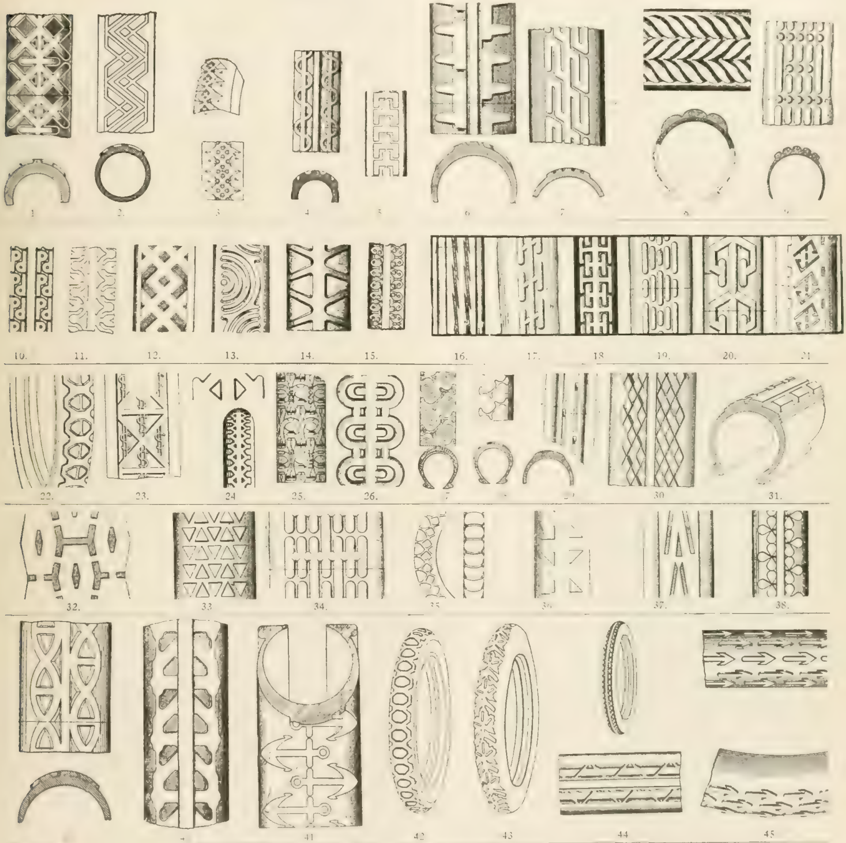
Countries of destination	Quantity	Value
United Kingdom ... tons	1,596	$1,556,357
Canada	138	44,895
France	113	43,909
Italy	30	11,447
Japan	33	22,755
United States	1,230	362,736
Totals	3,140	$2,042,099

GUTTA INFERIOR.

Countries of destination	Quantity	Value
United Kingdom	99	9,539
Canada	71	6,365
Australia	17	1,797
Other British possessions	1	42
France	10	1,022
Japan	144	16,009
United States	834	89,959
Other foreign countries	2	227
Totals	1,178	$124,960

Pneumatic Tire Tread Designs.

DECEMBER, 1916, TO SEPTEMBER, 1917.



Cut No.	Patent No.	Patentee or Assignee and Address
(1)	49,754.	E. P. Altenberg, East Palestine, Ohio.
(2).	49,786.	The B. F. Goodrich Co., New York City.
(3).	49,792.	G. W. Beldam, Ealing, England.
(4).	49,811.	C. A. Westover, Youngstown, Ohio.
(5).	49,836.	The Sebring Tire & Rubber Co., Sebring, Ohio
(6)	49,877.	The Victor Rubber Co., Springfield, Ohio.
(7)	49,901.	The Amazon Tire & Rubber Co., Akron, Ohio.
(8).	49,947.	S. J. Bogan, Torrance, California.
(9).	49,969.	The B. F. Goodrich Co., New York City.
(10)	50,567.	J. D. Kline and C. A. Barnholth, Akron, Ohio.
(11)	50,644.	H. S. Blynt, Binghamton, New York.
(12).	50,655.	G. P. Herrick, New York City.
(13).	50,673.	S. S. Adams, Lafayette, Tennessee.
(14)	50,681.	United & Globe Rubber Mfg. Cos., Trenton, New Jersey.
(15).	50,769.	E. Von Varevas and J. J. Vavora, Binghamton, New York
(16).	50,931.	J. M. Gilbert, New York City.
(17).	50,956.	The B. F. Goodrich Co., New York City.
(18).	50,961.	Racine Rubber Co., Racine, Wisconsin.
(19).	50,976.	The B. F. Goodrich Co., New York City.
(20).	50,977.	The B. F. Goodrich Co., New York City.
(21)	51,013.	F. T. Faircloth, San Francisco, California.
(22).	50,352.	R. H. Keaton, San Francisco, California.
(23)	[illegible]	C. B. Reynolds, Sawtelle, California.
(24).	50,361.	W. A. Robbins, Glen Ridge, New Jersey.
(25)	[illegible]	W. D. Freese, Akron, Ohio.
(26)	50,431.	The Norwalk Tire & Rubber Co., Norwalk, Connecticut.
(27)	50,120.	W. B. Buckley, New York City.
(28).	50,121.	W. B. Buckley, New York City.
(29)	50,134.	R. H. Keaton, San Francisco, California.
(30)	50,190.	Hood Rubber Co., Watertown, Massachusetts.
(31)	50,202.	E. Hopkinson, New York City.
(32)	50,793.	M. F. Oliver, Berkeley, California.
(33).	50,840.	J. C. Kocontes, River Forest, Illinois.
(34)	50,915.	The B. F. Goodrich Co., New York City.
(35)	50,873.	I. A. Jones, Los Angeles, California.
(36)	50,828.	W. B. Buckley, New York City.
(37)	50,871.	F. T. Faircloth, San Francisco, California
(38)	50,881	E. Von Varevas, Washington, D. C.
(39)	50,263	The Lancaster Tire & Rubber Co., Lancaster, Ohio
(40)	50,269	P. De Mattia and B. De Mattia, Clifton, New Jersey.
(41).	50,282	G. W. Odell, South Bend, Indiana.
(42).	49,927	R. H. Keaton, San Francisco, California.
(43)	49,958.	O. W. Dunham and F. W. Willis, Toronto, Ontario, Canada.
(44).	49,953.	W. R. Denman, Akron, Ohio.
(45).	49,952	G. Crowley, Hartford, Connecticut.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED MARCH 16, 1920.

NO. 1,333,630. Demountable rim for tires. J. E. Rhodes, Dallas, Texas.
1,333,673. Crate for automobile wheels or rims. O. A. Parker, Cleveland, Ohio.
1,333,674. Automobile wheel with pneumatic tires. O. A. Parker, Cleveland, Ohio.
1,333,679. Demountable rim for tires. H. D. Rey, Avarua, Raratonga Island, Cook Islands, New Zealand.
1,333,680. Demountable rim for tires. H. D. Rey, Avarua, Raratonga Island, Cook Islands, New Zealand.
1,333,748. Demountable rim for tires. J. M. Berry, Detroit, Mich.
1,333,779. Automobile tire. W. W. Robinson, East Liverpool, Ohio.
1,333,791. Hose coupling. O. C. Brandt, St. Paul, Minn.
1,333,915. Tire shoe and rim. S. E. Hall, assignor of one-half to W. G. Moser—both of Akron, Ohio.
1,333,928. Cushion wheel construction with dual solid tires. W. C. Martin, assignor to Morand Bros.-Martin Cushion Wheel Co.—both of Chicago, Ill.
1,333,929. Cushion wheel construction with single solid tire. W. C. Martin, assignor to Morand Bros.-Martin Cushion Wheel Co.—both of Chicago, Ill. (See THE INDIA RUBBER WORLD, November 1, 1919, page 88).
1,333,961. Dilator. C. O. Burgess, Monmouth, Ill.
1,333,983. Resilient heel lift. F. Kish, Elyria, Ohio.
1,334,011. Automobile wheel with pneumatic tires. E. K. Baker, assignor to Baker Wheel & Rim Co.—both of Chicago, Ill.
1,334,067. Cushion tire. W. A. Anglemyer, Indianapolis, Ind.
1,334,110. Reinforced pneumatic tire. D. Moriarty, Oakland, Calif.
1,334,171. Blow-out patch. C. A. Russell, Jr., Orange, Texas.
1,334,176. Indoor golf game. W. H. Seagrave, Cleveland, Ohio.
1,334,204. Air cushion tire. H. S. Williams, assignor of one-half to O. Keller—both of San Antonio, Texas.
1,334,205. Cushion tire. H. S. Williams, assignor of one-half to O. Keller—both of San Antonio, Texas.
1,334,210. Rubber heel or lift. J. T. Ashton, assignor of one-half to E. C. Heilhecker—both of Bristol, R. I.
1,334,237. Surgical device with pneumatic cushion. H. Fleck, Oklahoma, Okla.

ISSUED MARCH 23, 1920.

1,334,378. Hot-water bottle. H. E. Kaufman, West Brighton, N. Y.
1,334,438. Rubber horseshoe reinforced by metal insert. E. G. Crump, assignor to Perfection Rubber-Metal Horseshoe Co.—both of Akron, Ohio.
1,334,448. Inflatable tire. W. P. Gordon, assignor of one-half to T. B. Jacocks—both of Tarboro, N. C.
1,334,493. Demountable wheel tire. W. H. Holahan, assignor to Hol-Mor Wheel Co.—both of San Francisco, Calif.
1,334,514. Diaper supporter. M. J. Beitter, Nogal, N. M.
1,334,635. Grommet or tire-bead and method of making them. A. C. Pratt, Deep River, Conn.
1,334,793. Tank ball of rubber and rubber composition. C. Riegger, New York City.

ISSUED MARCH 30, 1920.

1,335,115. Tire filler. C. L. Huffman, Weatherford, Texas.
1,335,245. Cushion spring wheel. W. W. Krutsch, Coffeyville, Kans. assignor of one-half to W. M. Harrison, Muskogee, Okla.
1,335,268. Pneumatic tire and rim. A. L. Baker, Jerome, Mich.
1,335,273. Rubber shoe. A. M. Bruce, Ira, Mo.
1,335,341. Fountain pen. H. J. Jorgensen, Jersey City, N. J.
1,335,411. Tire-shoe and rim. J. H. Wagenhorst, Akron, Ohio.
1,335,442. Pneumatic tire. W. Kline, Mogadore, assignor to The Interlocking Cord Tire & Belt Co., Akron—both in Ohio.
1,335,467. Closure for water bottles, etc. J. C. Traynor, Buffalo, N. Y.
1,335,469. Pneumatic tire. R. R. Vale, Milford, Del.
1,335,496. Link cushion tire. M. Hamburger, Baltimore, Md.
1,335,505. Raincoat. P. O. Huntington, Brighton, assignor to H. M. Sawyer & Sons, Cambridge—both in Massachusetts.
1,335,710. Multiple-tread pneumatic tire. A. Jakovleff, assignor to Jak Tire Corp.—both of San Francisco, California.
1,335,711. Dual sectional pneumatic tire. A. Jakovleff, assignor to Jak Tire Corp.—both of San Francisco, Cal.
1,335,712. Sectional pneumatic tire. A. Jakovleff, assignor to Jak Tire Corp.—both of San Francisco, Cal.
1,335,713. Vehicle tire. A. Jakovleff, assignor to Jak Tire Corp.—both of San Francisco, Cal.

REISSUES.

14,832. Tennis ball. A. T. Saunders, Chicopee, Mass., assignor to A. G. Spaulding & Bros., Jersey City, N. J. (Original No. 1,287,766, dated December 17, 1918.)

ISSUED APRIL 6, 1920.

1,335,778. Demountable rim for tires. O. Abbadini, Fairbanks, Pa.
1,335,820. Resilient tire. F. C. Cave, Des Moines, Iowa.
1,335,840. Water-carrying attachment for safety razors, similar to ink sack in fountain pens. J. F. Kaylor, Pekin, Ill.
1,335,861 Dust cap for protecting automobile tire valves. J. Shaw, St. Louis, Mo.
1,335,916 Pneumatic tire. A. M. Poynter, London, England.
1,335,920 Dust proof and moth proof wardrobe with elastic tube in molding around opening. J. Rockett, Cleveland, Ohio.
1,335,976. Valve for inner-tube valve stems. V. A. Leach, San Francisco, Calif.
1,336,023. Combined valve cap and dust cap. A. B. Catterall, Ottumwa, Iowa.
1,336,139. Automobile tire. L. Hofmeister, Milwaukee, Wis.
1,336,173 Inner tube for pneumatic tires. J. J. Voorhees, Jr., Jersey City, N. J., assignor by mesne assignments to United States Compression Inner Tube Co., Tulsa, Okla.
1,336,316. Siphon starter. A. H. Marhenke, New York, N. Y.
1,336,348 Pneumatic tire with separate air chambers. F. G. Fido, Bombay, India.

THE DOMINION OF CANADA.

ISSUED MARCH 2, 1920.

197,600. Sole and heel of boots and shoes. G. W. Beldam, Ealing, and A. U. Benjamin, Brentford, coinventors—both in Middlesex, England.
197,609. Shoe for pneumatic tires. L. F. Bacon, Estelene, Colorado, U. S. A.
197,632. Sponge rubber cushion tire. T. W. Costello, San Francisco, California, U. S. A.
197,647. Sectional tire. E. W. Edwards, Akron, Ohio, U. S. A.
197,666. Stamp and envelope moistener. W. Hegland, Plentywood, Montana, U. S. A.
197,667. Inner tire. H. M. Henning, Hinkley, California, U. S. A.
197,674. Pneumatic tire with tread of metal sheathing. C. R. Irvine, Sarnia, Ontario, Canada.
197,685. Tire tread. J. Laube, Deer Island, Oregon, U. S. A.
197,687. Reinforced tire. H. J. Lomer, Detroit, Michigan, U. S. A.
197,720. Pneumatic tire filled with small cells self inflated when air is admitted to tube containing them. W. H. Richards, Knoxville, Tennessee, U. S. A.
197,733. Reinforced rubber and spring tire. A. F. Stockwell, Los Angeles, California, U. S. A.
197,742. Pneumatic tire. P. E. van Berendonck, Amsterdam, The Netherlands.
197,755. Rubber retainer. P. J. Young, Santa Susana, California, U. S. A.
197,801. Sanitary baby pants. The I. B. Kleinert Rubber Co., assignee of G. K. Gunzburg—both of New York City, U. S. A. (See THE INDIA RUBBER WORLD, December 1, 1919, page 157.)
197,832. Pneumatic tire. P. P. White, assignor of a half interest to A. Brooks—both of Wellington, New Zealand.

ISSUED MARCH 9, 1920.

197,875. Hose supporter. S. A. Glynn, W. H. Wolpert and Chas. J. Hanzel, coinventors—all of Antigo, Wisconsin, U. S. A.
197,891. Transversely split demountable rim for tires. W. N. Booth, Detroit, Mich, U. S. A.
197,916. Demountable rim for tires. R. R. Craft, Norfolk, Nebraska, U. S. A.
197,952. Two-part rim for tires. B. F. C. Haanel, Ottawa, Ontario, Canada.
198,036. Rubber sole. A. Santacroce, Elyria, Ohio, U. S. A.
198,056. Demountable rim for tires. J. Walker, Canonsburg, Pa., U. S. A.
198,075. Hose coupling. The Canadian Consolidated Rubber Co., Limited, Montreal, Canada, assignee of A. J. Brown, Union Hill, New Jersey, and A. A. Somerville, New York City, New York—both in U. S. A.
198,088 Demountable rim for tires. The Hayden Manufacturing Co., assignee of W. A. Hayden—both of Minneapolis, Minn., U. S. A.
198,091. Cushion tire. The K., F. & C. Tire & Rubber Corp., assignee of F. A. Krusemark, L. G. Funkhouser and H. G. Carpenter, all of Roanoke, Virginia, U. S. A. (See THE INDIA RUBBER WORLD, August 1, 1918, page 666.)
198,112 Demountable rim for tires. The Two Part Rim Co., assignee of C. L. Peters and A. L. Johnson—all of Worcester, Massachusetts, U. S. A.

ISSUED MARCH 16, 1920.

198,146. Inner tire protector. C. A. Stuart and G. E. Stuart, coinventors—both of Oregon City, Oregon, U. S. A.
198,165. Inner tube for automobile tires. G. C. Berryman, Los Angeles, California.
198,257. Inner tube for tires. T. L. Morton, New Orleans, Louisiana, U. S. A.
198,266. Spring tire. J. L. Ogden, Chicago, Ill., U. S. A.
198,312. Hose coupling. W. L. Walker, New York City, U. S. A.
198,365. Tire. D. S. Myers, St. Louis, Missouri, and S. Johnstone, Buffalo, New York, assignee of a half interest—both in U. S. A.

ISSUED MARCH 23, 1920.

198,396. Cushioned wheel hub. J. Bogdon and J. Mitrosky, coinventors—both of Perth Amboy, New Jersey, U. S. A.
198,510 Pneumatic seat support for motorcycles. H. Seibel, San Francisco, California, U. S. A.
198,511. Pneumatic seat support for motorcycles. H. Seibel, San Francisco, California, U. S. A.
198,512. Pneumatic seat support for motorcycles. H. Seibel, San Francisco, California, U. S. A.
198,557. Footwear of rubber, rubber compound and fiber. The Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, Canada, assignee of C. J. Randall, Naugatuck, Connecticut, U. S. A.
198,588 Brassière with elastic waist section. The Treo Co., Inc., assignee of M. W. Schloss—both of New York City, U. S. A.
198,597. Friction shoe. E. F. Nanfeldt, New Haven, Connecticut, and E. O. Christiansen, assignee of a fourth interest, Walpole, Massachusetts—both in U. S. A.

ISSUED MARCH 30, 1920.

198,751 Rubber heel. A. Santacroce, Elyria, Ohio, U. S. A.

THE UNITED KINGDOM.

ISSUED MARCH 10, 1920.

137,465 Modified scarf as head covering, of rubberized or other material. S. E. Smith, Dunkirk Crescent, Halifax, and A. Pearson, Corn Exchange Building, Manchester.
137,469. Device for attaching revoluble rubber heels. W. Plowright, 18, Palmerston avenue, Whalley Range, Manchester.

ISSUED MARCH 17, 1920.

137,709 Studs or bars for foot-ball and like boots, composed of layers of leather and rubber. R. T. Richardson, Victoria Road, Northampton.

Chemical Patents will be found on page 497. Machinery Patents on page 502.

137,729. Detachable rubber pad for heels. A. J. Maudlow, 11 Lakefield Road, Westbury avenue, Wood Green, London.

137,766. Tire reinforcing shoe of rubber vulcanized to steel band, secured to pneumatic tires by inflation. F. Lee-Deeks, 6 Broomfield Road, Chelmsford, Essex.

137,812. Aluminum shell heel for ladies' boots, recessed to receive conical plug of leather, rubber, etc. D. H. Finberg, 210 Washington avenue, St. Louis, Missouri, U. S. A.

ISSUED MARCH 24, 1920.

137,886. Weighing device for cyclists' skirts, padded with rubber. F. D. Henman, 25 Kendrick Road, Reading.

137,902. Respirator for aviators, etc. E. Martin, 30 Oxford Road, Putney, and W. Neuis, 3 London Wall Buildings—both in London.

137,921. Neck-ties with lining covered with gutta percha. F. W. Clarke, 31 Gower Road, Forest Gate, London.

137,931. Elastic band with fastener, for retaining umbrella ribs. H. F. McShane, 16 Fairlawn Mansions, Bedford Park, London.

137,942. Cushion wheel. E. B. Killen, 27 Queen Victoria street, London.

137,998. Reinforced pneumatic tire. W. L. Colmer, 16 The Crescent, Combs, Stowmarket, Suffolk.

138,010. Rubber pads for boot and shoe soles. Refers to specification No. 132,750 listed in THE INDIA RUBBER WORLD, January 1, 1920. H. J. Fussell, 3 St. George's Building, Upper Bristol Road, Bath, and E. G. Fussell, 167 Coldharbour Road, Clifton, Bristol.

138,029. Water-bottle and like stoppers. M. C. Schweinert, 226 Palisade avenue, West Hoboken, New Jersey, U. S. A.

138,089. Blow-off connections for tire inflators. Automatic Safety Tire Valve Corp., assignee of S. Kahn—both of 1765 Broadway, New York City, U. S. A. (Not yet accepted.)

ISSUED MARCH 31, 1920.

138,169. Coupling for mine ventilation hose. Refers to specification No. 106,219. N. B. Braly, 14 West Granite street, Butte, Montana, U. S. A.

138,195. Rubber pad for soles and heels. B. Etkind, 32 Houndsditch, London.

138,229. Rubber sole. J. Brandwood, Brandlesholme, Bury, Lancashire, and A. Thill, 33 Upper Bedford Place, London.

138,278. Artificial feet with rubber cushioned joints. C. Desoutter, 51 Baker street, London.

138,294. Corset with elastic inserts. D. Kops, 525 West End avenue, Manhattan, New York City, U. S. A.

138,296. Shoe for retreading tires. C. C. Gates, 999 South Broadway, Denver, Colorado, U. S. A.

138,306. Valve for inflated balls and toy balloons. Société Etablissements Bognier et Burnet, 21 rue des Files du Calvaire, Paris. (Not yet accepted.)

138,358. Reinforced pneumatic tire provided with openings for cooling. T. C. McEwen, 20 Beach street, Belleville, New Jersey, U. S. A. (Not yet accepted.)

NEW ZEALAND.

ISSUED MARCH 11, 1920.

41,256. Rubber heel. C. J. Wattson, 8 Cliff Road, St. Clair, Dunedin, New Zealand.

AUSTRALIA.

TO AMERICANS.

11,192. Device for deflating pneumatic tires. H. P. Kraft, Ridgewood, N. J., U. S. A.

THE FRENCH REPUBLIC.

PATENTS ISSUED, WITH DATES OF APPLICATION.

499,528. (December 18, 1918.) Improvements in vehicle wheels. The Dunlop Rubber Co., Limited.

499,807. (May 19, 1919.) Pneumatic tire. L. Martenet.

499,965. (May 23, 1919.) Elastic dumb-bells. G. Schurr.

500,086. (May 27, 1919.) Life-saving dress. A. V. Sims.

500,094. (May 27, 1919.) Improvements in wheels, particularly those of airplanes. The Dunlop Rubber Co., Limited.

500,081. (May 27, 1919.) Improvements in electric insulation. P. Venturini.

GERMANY.

PATENTS ISSUED, WITH DATES OF APPLICATION.

320,335. (January 4, 1914.) Casing for wheel tires. The Dunlop Rubber Co., Limited, and Collin Macbeth, Birmingham, England.

321,105. (May 6, 1914.) Casing for resilient tire. R. Strong, Farnborough, England.

321,139. (June 13, 1919.) Packing and insulating material. G. Ruth and Dr. E. Asser, Wandsbek.

321,186. (February 11, 1914.) Tire in which a soft rubber layer is interposed between an ebonite ring and the hard rubber outer casing. St. Helens Cable & Rubber Co., Limited, Arple, near Warrington, England.

TRADE MARKS.

THE UNITED STATES.

NO. 100,457. Representation of a shoe behind the letter T—boots and shoes made of leather, rubber, and canvas. Thomson Shoe Co., St. Paul, Minn.

109,995. The words LET-ER-RAIN within a circle behind a cross bar—waterproof clothing. Union City Manufacturing Co., Union City, Tenn.

111,596. Representation of a seal bearing the word NUSEAL—tire-filling compound. The Middletown Accessory-Laboratories Co., Middletown, O.

115,191. Representation of a tag bearing the word TAG having the cross-piece of the G extending to form a base after the word—sphygmomanometers, syringes, etc. Charles J. Tagliabue Manufacturing Co., Brooklyn, N. Y.

115,192. The word TAG, having the letters A and G joined by a short connecting line from the foot of the right leg of the A—sphygmomanometers, syringes, etc. Charles J. Tagliabue Manufacturing Co., Brooklyn, N. Y.

116,241. The word "ZIP" quoted—self-vulcanizing tire patches. J. M. Stucker, Rosedale, Kans.

117,346. Representation of a round seal or label bearing the figure of an athlete balancing a ball between the words ME DAR—sporting goods including game balls, rubber bladders, striking bags, etc. Fred Medart Manufacturing Co., St. Louis, Mo.

120,393. The word UNIQ—running-board mats, heel rests, etc., for automobiles. The C. Spiro Manufacturing Co., New York City.

121,385. The word DURATOP—waterproof textile fabrics. The Duratex Co., Newark, N. J.

122,024. The word REPEX—waterproof coats. W. O. Peake, Limited, London, Eng.

122,907. The words O-PEE-CHEE—chewing gum. O-Pee-Chee Gum Co., Limited, London, Ont., Can.

123,501. The representation of a loon above the word LOON—waterproof fabrics. James Scarlett, Seattle, Wash.

123,530. The word AP-RUCO—canvas outing shoes. Apsley Rubber Co., Hudson, Mass.

123,988. Representation of a label bearing the letters and words L. P. L. CHIC-L-MINT JR. CO. on a combined circle and diagonal cross-bar—chewing gum. L. P. Larson, Jr., Co., Chicago, Ill.

124,027. The word WEARMOOR—raincoats. Franklin Simon & Co., Inc., New York City.

124,238. The word HUSKIE—tires, tire casings, and inner tubes. The Portage Rubber Co., Barberton, O.

124,391. The word BLACKSTONE—tires, tire casings, and inner tubes. The Canton-Blackstone Co., Canton, O.

124,962. The words WESTERN STATES, having the letters W and N larger than the others with the word States between them—tires, inner tubes, tire boots, and tire patches. Washington Tire & Rubber Co., Spokane, Wash.

124,963. The letters W and S superimposed on the upper and lower parts of the circumference of a heavy black circle—tires, inner tubes, tire boots, and tire patches. Washington Tire & Rubber Co., Spokane, Wash.

125,003. The word FLEXYDE—composition rubber material in sheet form. The Marathon Tire & Rubber Co., Cuyahoga Falls, O.

125,143. Representation of a double-outlined geometrical figure—chewing gum. Wm. Wrigley, Jr., Co., Chicago, Ill.

125,302. The words "GEM-DANDY" quoted—garters. Penn Bros. Suspender Co., Madison, N. C.

125,576. The words "KLEAR-SKIN" quoted, above the head of a girl holding a sponge against her face—rubber sponges. The Miller Rubber Co., Akron, O.

126,259. Outline of a rubber heel bearing the word SCOOP, and the representation of a scoop—rubber and rubber composition heels. Panther Rubber Manufacturing Co., Stroughton and Chelsea, Mass.

126,558. Representation of a conventionalized double-headed animal beneath the name J. & T. COUSINS Co. and above the words NEW YORK, U. S. A.—rubber and fabric boots and shoes. J. & T. Cousins Co., Brooklyn, N. Y.

126,905. The figure and letters 3MORE with the letters in lower case type—garters. Penn Rivet Corp., Philadelphia, Pa.

127,254. The word RELLIM—water bottles, syringes, and rubber tubes. The Miller Rubber Co., Akron, O.

THE DOMINION OF CANADA.

25,590. The word FLEXO—garters, hose supporters, and arm bands. A. Stein & Co., Chicago, Ill., U. S. A.

26,059. Representation of the head of a bull moose, with the name "THE MERCHANTS RUBBER CO., LIMITED" in different sizes of block type, arranged so as to form a base—rubber footwear. Canadian Consolidated Rubber Co., Limited, Montreal, Que.

26,062. The word OUTLOOK in fancy letters—windshield cleaners. The Outlook Co., Cleveland, O., U. S. A.

26,068. The number and word 4810 AIRTITE—rubber hose. Canadian Consolidated Rubber Co., Limited, Montreal, Que.

26,071. The word ADMIRATION—belting, hose, and packing of all kinds. Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ont.

26,101. The letters K. & S. arranged within a circular band—tires, tubes, and accessories; rubber goods molded, blown, dipped, hand made; mechanical rubber goods, and footwear. K. & S. Canadian Tire & Rubber Co., Limited, Toronto, Ont.

26,108. The word ECONOMY—rubber and rubber composition and fiber taps for boots and shoes. Emery Heel Sales Co., Boston, Mass., U. S. A.

THE UNITED KINGDOM.

384,720. The word HERMETIC—tire valves, etc. The Self-Sealing Rubber Co., Limited, Hermetic Works, Ryland street, Birmingham, Warwickshire.

384,721. The word HERMETIC—linen or hemp canvas prepared for tire manufacture, rubber-proofed canvas, etc. The Self-Sealing Rubber Co., Limited, Hermetic Works, Ryland street, Birmingham, Warwickshire.

384,722. The word HERMETIC—tires, inner tubes, repair patches, rubber bulbs, heel pads, etc. The Self-Sealing Rubber Co., Limited, Hermetic Works, Ryland street, Birmingham, Warwickshire.

384,723. The word HERMETIC—repair outfits for tires, vulcanized fiber, electrical insulating tapes, hose, etc. The Self-Sealing Rubber Co., Limited, Hermetic Works, Ryland street, Birmingham, Warwickshire.

388,638. The word ARIEL—all rubber goods in Class No. 40 except elastic webs and cords used in manufacturing clothing. Ariel Works, Limited, Ariel Works, Bournbrook, Birmingham.

389,633. The word NASACLES—respirators. A. St. J. Cooke, 40A Hyde Park Gate, London, S.W.7.

389,668. The words in script, EL CONDE DE RAMIREZ DE ARELLANO—gas-masks and respirators. F. J. H. y Ramirez de Arellano, el Conde de Ramirez de Arellano, Batchelor's Farm, Barns Green, near Horsham, Sussex.

389,905. Representation of an electrical insulator bearing the word WALGER, within a diamond insulators and insulating preparations included in Class No. 40 E. A. Walshaw, Glasgow Road, Bolton, County of Peel, Ontario, Canada.

391,058. The word Rosco within a conventionalized figure inside of a diamond made up of black and white oblong checks artificial leather. The Rossendale Rubber Co., Limited, Shawclough Rubber Works, Shawclough Road, Waterfoot, near Manchester.

391,699. Representation of an airplane with a woman aviator, bearing the words ANTI-FLU INHALER, the whole above the words (AUNTIE-FLEW) in parentheses—non-medicated inhalers included in Class No. 11. C. J. Clamp, 8 Botolph Lane, Eastcheap, London, E. C. 3.

392,726. The word STOCO—rubber-rimmed safety goggles, etc. The Standard Optical Co., 160 Lyceum street, Geneva, N. Y., U. S. A. (Care of C. W. Dommett & Son, 46 Gresham street, London, E. C. 2.)

393,449. The word USCO—tires and parts of tires. United States Rubber Co., 1790 Broadway, New York City, U. S. A. (Care of Haseltine, Lake & Co., 28 Southampton Buildings, London, W. C. 2.)

393,451. The word "Usco" quoted rubber heels United States Rubber Co., 1790 Broadway, New York City, U. S. A. (Care of Haseltine, Lake & Co., 28 Southampton Buildings, London, W. C. 2.)

395,985. The word RAYNBO—rubber erasers F. Chambers & Co., Limited, The Garden Pencil Works, Derby Road, Stapleford, Nottinghamshire.

396,183. The word RUBROX—all goods included in Class No. 40. Herbert J. Fussell & Co., Locksbrook Rubber Mills, Locksbrook Road, Lower Weston, Bath.

396,215. Representation of head of Minerva above the word MINERVA—goods manufactured from rubber and gutta percha except heel pads, etc. Copestake, Crampton & Co., 5 Bow Church Yard, London, E. C. 4.

396,240. The words EL PELOTARI above representation of a juggler of ball and swords, all above a scroll rubber and gutta percha goods not included in classes other than Class No. 40. Kolp Coleman & Co., 5 Hall street, Manchester.

396,307. The word PALATINE all rubber goods including Class No. 11. The Leyland & Birmingham Rubber Co., Limited, Golden Hill Works, Leyland, Lancashire.

396,308. The word PALATINE—all rubber goods included in Class No. 38. The Leyland & Birmingham Rubber Co., Limited, Golden Hill Works, Leyland, Lancashire.

396,309. The word PALATINE—all rubber goods included in Class No. 39. The Leyland & Birmingham Rubber Co., Limited, Golden Hill Works, Leyland, Lancashire.

396,418. The word VULKASET—brushes included in Class No. 50. C. H. Leng & Sons, Reliance Works, Sherbourne Road, Balsall Heath, Birmingham.

396,480. The word FOYNTA—foot balls. Jackson & Blackburn, 51 Park Square, Ossett, near Wakefield, Yorkshire.

396,578. Representation of a lizard above the word LIZARD—fountain pens. A. W. Brooke, "Mera Ghar," Woodhey, Rock Ferry, Cheshire.

396,595. The word BTORACO—goods manufactured from rubber and gutta percha, not included in classes other than No. 40, Brotherton, Ratcliffe & Co., Limited, Winchester House, Old Broad street, London, E. C. 2.

396,776. The word "SOQUETTE" witain quotation marks—a game called table football. George A. J. Thompson, 405 Rotherhithe New Road, North Camberwell, London, S. E. 16.

396,849. The word ALADDIN—goods manufactured from rubber and gutta percha. Industrial Rubber Products, Limited, Brook House, 191-192 Tottenham Court Road, London, W. 1.

396,855. The word SALCANI—sanitary appliances. A. de St. Dalmas & Co., 49 Belgrave Gate, Leicester.

396,936. The word INDRUPRO—goods manufactured from rubber and gutta percha. Industrial Rubber Products, Limited, Brook House, 191-192 Tottenham Court Road, London, W. 1.

397,[illegible] Representation of a label bearing the bust of a girl and the quoted word "ELARCO"—surgical rubber goods and druggists' sundries. L. A. Jackson, trading as London Rubber Co., 183 Aldersgate street, London, E. C. 1.

397,13[illegible]. The word TREVA—electrical insulators, etc., of ebonite or like substances manufactured from rubber or gutta percha. Trevelyan & Co., 155 Bracebridge street, Birmingham.

397,155. The word LASTIBAC—corsets. Drew, Son & Butcher, Limited, Gascoyn Factory, Trim street, Bath.

397,301. The words BLACK ADDER—garden hose. Reliance Rubber Co., Limited, 212-213 Upper Thames street, London, E. C. 4.

397,314. The word FOUNTAIN—pneumatic tires. J. A. Andrews, 4 Marldon avenue, Great Crosby, Liverpool.

397,445. The word TYRIAN above a tire inclosing the monogram T. R. Co., all above the words Trade Mark—tires. Tyer Rubber Co., Andover, Mass., U. S. A. (Care of B. J. Wildbore & Son, 38 Great Tower street, London, E. C. 3.)

397,512. The word FUSILITE—artificial leather. The British Airless Tyre Co., Limited, Wells Road, Westfield, Radstock, Somerset.

397,722. The word HERWHIT—rubber and gutta percha goods not included in classes other than Class No. 40. Herbert Whitworth, Limited, Whitworth House, 115 Princess street, Manchester.

397,757. The word IRIDIO—rubber and gutta percha goods not included in classes other than Class No. 40. F. E. Freeman, A. E. Derrick, and C. L. Lovesey, trading as partners, 23 Lansdown Parade, Cheltenham.

397,871. The word BRENTFIELD—pressure gages and indicators for vulcanizing plant. The Dental Chair & Engineering Co., Limited, New River Works, Dog Lane, Neasden, London, N. W. 10.

397,880. Representation of a jay in a bush and the initials and word J. T., LONDON—all rubber goods included in Class No. 11. James Tompkins, Limited, 386, City Road, London, E. C. 1.

397,881. Representation of a jay in a bush and the initials and word J. T., LONDON—all rubber goods included in Class No. 40, not included in other classes. James Tompkins, Limited, 386 City Road, London, E. C. 1.

397,899 The word ALMINKO—balata belting. The General Commercial Co. of London, Limited, 114 Cannon street, London, E. C. 4.

398,087. The word MAGNUM—golf balls. The Dunlop Rubber Co., Limited, Dunlop House, Albany street, Regent's Park, London, N. W. 1.

398,195. Representation of a label bearing the words GREYHOUND TIRES AND TUBES, with a tire rolling along the roadway of a landscape, pursued by greyhounds, and the words ON THE TRAIL OF A GOOD TIRE in the foreground—tires and tubes. North Western Motors, Limited, Mersey Chambers, Covent Garden, Liverpool.

AUSTRALIA.
TO AMERICANS.

22,986. Representation of seal bearing words THE "ANTI-COLIC" BRAND, THREE HOLE NIPPLES, BALL TOP—rubber nursing nipples. C. W. Meinecke, New York City, U. S. A.

23,946. Representation of setting sun, with words SUN BRAND—rubber or mackintosh clothing, rubber boots and shoes. Gutta Percha & Rubber, Limited, Toronto, Ont., Can.

23,978. Representation of Maltese cross with company's name inside round band—rubber or mackintosh clothing, rubber boots and shoes. Gutta Percha & Rubber, Limited, Toronto, Ont., Can.

23,979. Same as No. 23,978—rubber hose, packing, etc. Gutta Percha & Rubber, Limited, Toronto, Ont., Can.

23,980. Same as No. 23,946—rubber hose, packing, etc. Gutta Percha & Rubber, Limited, Toronto, Ont., Can.

24,713. The words HALF SOLE TIRE—tires. Gates Rubber Co., Denver, Colo., U. S. A.

25,075. The word TESTBESTOS—brake lining. American Asbestos Co., Norristown, Pa., U. S. A.

25,191. Representation of a face within a tire and the word LEE tires, inner tubes, patches, rubber belting, etc. Lee Tire & Rubber Co., New York City, U. S. A.

25,417. Representation of a star with the word STAR—tires, patches, tire liners, retread beading, etc. Star Rubber Co., Akron, O., U. S. A.

25,662. The letter N within a circle—tires, casings, and inner tubes. The Norwalk Tire & Rubber Co., Norwalk, Conn., U. S. A.

25,910. The word SAVOLD—rebuilt tires, tire casings, inner tubes, etc. S. H. Goldberg, Chicago, Ill., U. S. A.

26,062. Representation of cord tire around firm name, which in turn encircles the figure of a globe with diagonal marks—rubber or gutta percha goods The Manhattan Rubber Manufacturing Co., Passaic, N. J., U. S. A.

26,063. Same as No. 26,062—packing and hose. The Manhattan Rubber Manufacturing Co., Passaic, N. J., U. S. A.

26,385. The word RAYNSTER—rubber clothing. United States Rubber Co., New Brunswick, N. J., U. S. A.

26,424. A red disk on end of barrel fountain pens. The Evans Dollar Pen Co., Waterloo, Ia., U. S. A.

26,425. The words THE KADY garters, suspenders, belts, etc. The Ohio Suspender Co., Mansfield, O., U. S. A.

26,428. The words VITALIC TIRES pneumatic tires and tubes. Continental Rubber Works, Erie, Pa., U. S. A.

26,461. Representation of a Liberty cap above the word LIBCO—rubber tires. Liberty Steel Products Co., Inc., New York City.

26,563. The words KELLY SPRINGFIELD within a circle pneumatic tires. Kelly-Springfield Tire Co., New York City, U. S. A.

NEW ZEALAND.
TO AMERICANS.

14,472 Representation of a label bearing the words THE "ANTI-COLIC" BRAND THREE-HOLE BALL TOP NIPPLES, etc., with notice of registration in the United States and Canada of the trade mark "ANTI-COLIC" on a blue label on each nipple—rubber nipples for nursing bottles. C. W. Meinecke, 48 Park Place, New York City, U. S. A.

15,723 Representation of an arrow pointing toward the left—chewing gum. William Wrigley Junior Co., 5 North Wabash avenue, Chicago, Ill., U. S. A. (Associated with No. 13,319.)

15,760. The word EVERLOC—tire patches. W. C. Wood, trading as W. C. Wood Co., 74 Western avenue, Minneapolis, Minn., U. S. A.

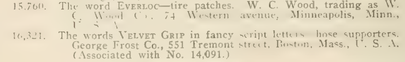
16,321. The words VELVET GRIP in fancy script letters hose supporters. George Frost Co., 551 Tremont street, Boston, Mass., U. S. A. (Associated with No. 14,091.)

DESIGNS.
THE UNITED STATES.

NO. 54,720. Tire. Patented March 23, 1920. Term 14 years. A. L. Breitenstein, Akron, assignor to The Knox Tire & Rubber Co., Mount Vernon—both in Ohio.

54,725. Tire. Patented March 23, 1920. Term 14 years. J. Christy, Cleveland, O.

54,740. Tire. Patented March 23, 1920. Term 14 years. C. J. Hodges, assignor to The Quality Tire & Rubber Co.—both of Anderson, Ind.



54,720 54,725 54,740 54,758 54,797 54,844

54,758. Tire. Patented March 23, 1920. Term 14 years. L. B. Lyman, Tallmadge, O.

54,797. Pneumatic tire. Patented March 23, 1920. Term 14 years. M. L. Wiener, Akron, O.

54,844 Tire. Patented April 13, 1920. Term 14 years. E. G. Hulse, Akron, O., assignor to Kelly-Springfield Tire Co., New York City.

54,859. Rubber heel. Patented April 13, 1920. Term 14 years. T. Nicar, South Bend, Ind.

THE DOMINION OF CANADA.

4,702. Non-skid tread for vehicle tires. Patented January 20, 1920. The Gregory Tire & Rubber Co., Limited, Vancouver, B. C.

Review of the Crude Rubber Market.

NEW YORK.

THE CRUDE RUBBER MARKET was dull throughout April with a sharp decline toward the end of the month. The little trading in evidence was purely speculative, as the manufacturers continued to refrain from buying. The large arrivals of crude rubber continue and the rate of exchange and the strikes may have affected prices. Parás were dull, with little trading and little change in prices.

Prices for plantation and South American rubber at the beginning and toward the end of the month are shown in the following quotations:

PLANTATIONS. April 1, first latex crêpe, spot 46½ cents; May-June, 47½ cents; July-September, 48¾ cents; July-December, 49½ cents; January-June, 1921, 51½ cents; April 26, spot, 42½ cents; May-June, 43¼ cents; July-September, 44 cents; July-December, 44½ cents; January-June, 1921, 47 cents.

April 1, ribbed smoked sheets, spot, 46 cents; May-June, 47¼ cents; July-September, 48¾ cents; July-December, 49½ cents; January-June, 1921, 51½ cents; April 26, spot, 42½ cents; May-June, 42½ cents; July-September, 44 cents; July-December, 44½ cents; January-June, 1921, 47 cents.

April 1, No. 1 amber crêpe, spot, 46 cents; May-June, 46 cents; July-December, 47 cents; April 26, spot and futures, 45 cents.

April 1, No. 1 rolled brown crêpe, spot, 40 cents; May-June, 40 cents; July-December, 40½ cents; April 26, spot and futures, 35 cents.

SOUTH AMERICAN PARÁS AND CAUCHO. April 1, spot prices: upriver fine 42 cents, islands fine 41½ cents, upriver coarse 31 cents, islands coarse 21½ cents, Cametá coarse 22 cents, caucho ball 32 cents.

April 26, upriver fine 42 cents, islands fine 40-41½ cents, upriver coarse 31 cents, islands coarse 22 cents, Cametá coarse 22 cents, caucho ball 31½ cents.

NEW YORK QUOTATIONS.

Following are the New York spot quotations, for one year ago, one month ago and on April 26, the current date:

	May 1, 1919.	April 1, 1920.	April 26, 1920.
PLANTATION HEVEA—			
First latex crêpe	$0.48½ @	$0.46½ @ .47	$0.42½ @ .43
Amber crêpe No. 1	.46 @	.46 @	.44 @ .45
Amber crêpe No. 2	.45 @	.45½ @	.43 @
Amber crêpe No. 3	.44 @	.44½ @	.42 @
Amber crêpe No. 4	.43 @	.42½ @	.41 @
Brown crêpe, thick and thin, clean	.43 @	.43 @	.42 @
Brown crêpe, thin specky	.41 @	.41 @	.39 @
Brown crêpe, rolled	.34 @	.40 @	.34 @ .35
Smoked sheet, ribbed, standard quality	.47½ @	.46 @	.42½ @ .43
Smoked sheets, plain, standard quality	.46 @	.45 @	.40 @
Unsmoked sheet, standard quality	.44 @	@	@
Colombo scrap No. 1	.33 @	.33 @	.35 @
Colombo scrap No. 2	.30 @	.31 @	.32 @
EAST INDIAN—			
Assam crêpe	@	@	@
Assam onions	@	@	@
Penang block scrap	.39 @	@	@
PONTIANAK—			
Banjermassin	.14 @ .17	.13 @	.13 @
Palembang	@	@	@
Pressed block	.23½ @ .25	.25 @	.25 @
Sarawak	.14½ @	@	@
SOUTH AMERICAN—			
PARAS—			
Upriver fine	.56½ @	.42 @ .42½	.42 @
Upriver medium	@	.39½ @ .40	.39 @
Upriver coarse	.34½ @	.31 @	.31 @
Upriver weak, fine	.43 @	.35 @	.36 @
Islands, fine	*.48 @	.41½ @	*.41½ @
Islands, medium	*.43 @	.39½ @ .40	*.38 @
Islands, coarse	*.22 @	.21 @ .21½	.22 @
Cametá, coarse	*.23 @	.22 @	.22 @
Madeira, fine	@	@	.44 @
Acre Bolivian, fine	@	@	.42½ @
Peruvian, fine	.53 @	.40¾ @	.40 @
Tapajos, fine	.53 @	@	.40 @
SOUTH AMERICAN—			
CAUCHO—			
Lower caucho ball	$0.31 @	$0.30 @	$0.29 @
Upper caucho ball	.36 @	.32 @	.32½ @
MANICOBAS—			
Ceara negro heads	.36 @	.36 @	*.33 @
Ceara scrap	.26 @	.30 @	*.30 @
Manicoba, 30% guarantee	.34 @	.32 @	*.30 @ .33
Mangabeira thin sheet	.36 @	.30 @	.31 @
CENTRALS—			
Corinto scrap	.33 @	.28 @ .29	.29 @ .30
Esmeralda sausage	.33 @	.27 @ .28	.29 @ .30
Central scrap	.32½ @	.26 @ .27	@
Central scrap and strip	.32 @	.25 @ .26	.27 @ .28
Central wet sheet	.22 @	.20 @	.19 @
Guayule, 20% guarantee	.30 @	.27 @	.28 @
Guayule, washed and dried	.40 @	.38 @	.38 @
AFRICANS—			
Niger flake, prime	.22 @	.18½ @	.18 @
Benguela, extra No. 1, 28%	@	.26½ @	.25 @
Benguela, No. 2, 32½%	@	.23 @	.21 @
Congo prime, black upper	.42 @	@	.37 @
Congo prime, red upper	.40 @	@	.33 @
Kassai black	@	.38 @	@
red	@	@	.35 @
Rio Nunez ball	.50 @	@	.36 @
Rio Nunez sheets and strings	.50 @	.36 @	.34 @
Conakry niggers	.50 @	.35 @	.34 @
Massai sheets and strings	.50 @	@	.34 @
GUTTA PERCHA—			
Gutta Siak	.26 @	.29 @ .30	.30 @ .31
Red Macassar	2.20 @	2.60 @	2.70 @
BALATA—			
Block, Ciudad Bolivar	.76½ @	.58 @ .60	.67 @ .68
Colombia	@	.49 @ .50	.53 @ .54
Panama	.46 @ .47	.40 @ .46	.48 @ .50
Surinam sheet	.97 @ .99	.78 @	.84 @
amber	@	.82 @	.86 @

*Nominal.

RECLAIMED RUBBER.

Essentially the same conditions which prevailed in the reclaimed rubber market during February and March controlled the situation of reclaimed in all grades during April. Reclaimers are oversold for from two to three months, consequently are not seeking business. Prices, however, have not been advanced and remain as reported last month. Current buying is in relatively small volume and large users are not seeking to make commitments beyond the middle of the year.

NEW YORK QUOTATIONS.

April 26, 1920.

Prices subject to change without notice

Standard reclaims:			
Floating	$0.30	@	$0.35
Friction	.35	@	.40
Mechanical	.12½	@	.13½
Red	.23	@	.24
Shoe	.16	@	.16½
Tires, auto	.16	@	.17
truck	.13	@	.14
White	.22	@	.25

COMPARATIVE HIGH AND LOW NEW YORK SPOT RUBBER PRICES.

	April. [1]1920.	April. 1919.	April. 1918.
PLANTATIONS:			
First latex crêpe	$0.46½ @ $0.42½	$0.51 @ $0.47½	$0.70 @ $0.59
Smoked sheet ribbed	.46 @ .42	.50 @ .47	.70 @ .59
PARAS:			
Upriver, fine	.42 @ .41½	.56 @ .56	.70 @ .60
Upriver, coarse	.32 @ .31	.34 @ .34	.39 @ .34
Islands, fine	.42 @ .41	.47½ @ .47½	.55 @ .48
Islands, coarse	.21½ @	.21½ @ .21½	.28 @ .23
Cametá	.22½ @	.22½ @ .22½	.28 @ .23

[1]Figured only to April 26, 1920.

THE MARKET FOR COMMERCIAL PAPER.

In regard to the market for crude rubber paper, Albert B. Beers, 1 Liberty street, New York City, advises as follows:

"During April there has been a fair demand for paper from out-of-town banks, but New York banks have been buying very little. Rates on the best rubber names have ruled at 7 to 7½ per cent, mostly the higher rate."

SINGAPORE RUBBER MARKET.

GUTHRIE & CO., LIMITED, Singapore, report [March 4, 1920]:

The usual weekly auctions held yesterday and today opened with a steady demand for all grades (with the exception of fine pale crêpe) which continued throughout the sales. Fine pale crêpe, which was distinctly out of favour, and of which only a few lots were sold, realized up to $1.07 (two lots sold at $1.08½ and one lot at $1.07½) or 1½ cents lower than last week's price. Ribbed smoked sheet fetched up to $1.10½, or the same as last auctions. The lower grades sold at from 1½ to 4 cents below last auction's prices. Out of 1,168 tons catalogued, 945 tons were offered and 557 tons sold.

The following is the course of values:

	In Singapore, per Pound[1].	Sterling Equivalent per Pound in London.
Sheet, fine ribbed smoked......	107c @ 110½c	2/ 8½ @ 2/9½
Sheet, good ribbed smoked.....	100 @ 106½	2/ 6½ @ 2/8¾
Crêpe, fine pale	105 @ 107	2/ 8⅛ @ 2/9
Crêpe, good pale	99 @ 104	2/ 6¾ @ 2/8⅛
Crêpe, fine brown	92 @ 100	2/ 4¾ @ 2/7
Crêpe, good brown.............	87 @ 91½	2/ 3⅝ @ 2/4⅝
Crêpe, dark	82 @ 88	2/ 1⅞ @ 2/3⅝
Crêpe, bark	72 @ 83	1/11⅛ @ 2/2¼

[1] Quoted in Straits Settlements currency; $1 = $0.567 United States currency.

AMSTERDAM RUBBER MARKET.

JOOSTEN & JANSSEN, Amsterdam, report [April 1, 1920]:

The rubber market was again very quiet, for spot as well as for those parcels still in the boats already arrived. Sellers are still asking their former prices, in spite of the lower oversea markets; New York also quoted slightly lower prices. There was a little inquiry on our market, but only at cheaper prices. The unchanged outlook in the strike makes business very difficult, and the approaching holidays do not tend to make matters more lively.

On the terminal market there was only a limited turn-over, as there were more sellers than buyers, the latter only at lower prices. Taken all around our terminal market has kept very steady compared with foreign markets. Prices have ranged from f. 1.37 to f. 1.38½.

ANTWERP RUBBER MARKET.

GRISER & CO., Antwerp, report [April 1, 1920]:

We have no changes to report, prices continuing depressed, although now they are at the same level as before the war. The price of Sumatra smoked sheet is 14.20 francs. The stock of india rubber at Antwerp is 560 tons.

As usual at Easter time, the future market shows absolutely no dealings; lack of interest everywhere. The closing price for the next twelve months is 13.40 francs.

BATAVIA RUBBER MARKET.

HERMANS, MARSMAN & CO., Batavia, report [December 16, 1919-January 15, 1920]:

A good demand prevailed during the first week under review and prices increased as far as 1.48 florins for prime smoked sheets and fine pale crêpe, ready delivery. Afterwards the tone of the market became dull and prices dropped quickly, on account of the decreased rates of exchange on London and Singapore. The market closed with a slight improvement and small lots changed hands at: f. 1.40 for fine pale crêpe, f. 1.41 for prime smoked sheets and f. 1.35 for off crêpe. while lower grades remained without interest. At the moment there is some demand for forward deliveries at f. 1.44 for prime grades.

PLANTATION RUBBER EXPORTS FROM JAVA.

	January. 1919.	January. 1920.
To Netherlands ......kilos	......	......
Great Britain	646,000	319,000
United States	1,423,000	148,000
Singapore	538,000	1,044,000
Other countries	64,000	391,000
Totals	2,671,000	1,902,000
Ports of origin:		
Tandjing Priok	1,332,000	529,000
Samarang	22,000	74,000
Soerbaya	1,210,000	1,071,000
Probolinggs	......	32,000
Cheribon	......	4,000
Tjilatjap	......	192,000

CEYLON RUBBER IMPORTS AND EXPORTS.

IMPORTS.

	January 1 to March 1. 1919.	January 1 to March 1. 1920.
Crude rubber:		
From Straits Settlements..........pounds	145,044	621,073
British India	318,484	451,335
Burma and other countries	......	6,300
Totals	463,528	1,078,708

EXPORTS.

	1919.	1920.
Crude rubber:		
To United Kingdom ....pounds	4,479,465	5,400,884
Belgium	......	18,360
France	260,195	58,120
Australia	62,742	20,191
United States	14,266,471	5,034,300
Canada and Newfoundland	......	257,600
India	1,612	......
Straits Settlements	424	......
Japan	35,880	52
Totals	19,106,789	10,789,627

(*Compiled by the Ceylon Chamber of Commerce.*)

EXPORTS OF CRUDE RUBBER FROM BELAWAN (DELI), SUMATRA.

	December. 1918.	December. 1919.	Year Ended December 31. 1918.	Year Ended December 31. 1919.
To Netherlands—pounds	....	762,216	....	6,166,393
Great Britain	....	608,373	3,383,600	9,087,313
Italy	....	....	....	134,464
United States	461,001	2,049,868	6,694,600	19,644,170
Canada	....	....	132,000	....
British India	....	....	330,000	....
Japan	....	....	....	2,156
Australia	....	....	....	404,778
Penang	26,646	158,578	451,000	1,187,252
Singapore	1,914,444	1,079,375	17,307,400	21,334,775
Hongkong	....	....	....	366,318
Other countries	....	3,331	....	3,331
Totals	2,402,091	4,661,741	28,298,600	58,330,950

FEDERATED MALAY STATES RUBBER EXPORTS.

An official report from Kuala Lumpur says that 9,781 tons of plantation rubber were exported from the Federated Malay States in the month of February, as against 11,119 tons in January and 10,809 tons in February of last year. The total exports for the two months were 20,900 tons, as compared with 17,972 tons in 1919, and 14,408 tons the year before. Appended are the comparative figures:

	1918.	1919.	1920.
January ....tons	7,558	7,163	11,119
February	6,820	10,809	9,781
Totals	14,408	17,972	20,900

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official report from Singapore states that 17,379 tons of rubber were exported from Straits Settlements ports in the month of February, compared with 13,125 tons in January, and 15,561 tons in the corresponding month last year. Transshipments for February amounted to 2,460 tons. For two months of the present year the exports amounted to 30,504 tons against 30,065 tons for the corresponding period in 1919, and 6,636 tons in 1918. Appended are the comparative statistics:

	1918.	1919.	1920.
January ....tons	4,302	14,404	13,125
February	2,334	15,661	17,379
Tools	6,636	30,065	30,504

FRENCH INDO-CHINA RUBBER EXPORTS, 1908-1918.

	To France. Kilograms.	To France. Francs.[1]	To Other Countries. Kilograms.	To Other Countries. Francs.
1908	36,884	239,746	98	637
1909	32,163	144,734	3,219	14,485
1910	170,074	765,333	5,396	24,282
1911	227,359	1,023,115	17,783	80,024
1912	225,565	1,015,042	6,129	27,581
1913	168,676	759,043	45,259	203,665
1914	164,034	657,153	48,612	218,754
1915	376,741	1,692,635	600	2,700
1916	547,817	3,286,902	770	4,620
1917	930,803	5,584,818	25	190
1918	537,678	3,226,068	....	....

[1]One franc equals $0.193 United States currency.

(*Bulletin Economique de l'Indo-Chine, Hanoi-Haiphong.*)

UNITED STATES IMPORTS OF PLANTATION RUBBER BY PORTS—1919.[1]

1919	San Francisco.	Seattle.	Vancouver.	Tacoma.	Totals. Pacific Ports.	Totals. New York.
January ......tons	433	2,162	951	......	3,546	1,360
February	1,188	5,256	4,690	1,298	12,423	1,656
March	7,612	5,771	389	241	14,013	9,667
April	1,996	9,117	405	......	11,518	13,160
May	5,254	2,200	......	......	7,454	7,402
June	907	......	1,491	......	2,398	11,247
July	474	987	54	223	1,738	15,907
August	2,335	384	233	141	3,093	5,128
September	823	......	450	......	1,273	8,870
October	548	329	834	......	1,711	23,772
November	2,121	......	274	......	2,395	11,997
December	2,789	1,246	33	......	4.068	21,852
Totals	22,249	27,452	9,804	1,894	65,630	132,018

[1] Reprinted to give complete statistics for Pacific ports.

(*Compiled by the Rubber Association of America, Inc.*)

UNITED STATES CRUDE RUBBER IMPORTS FOR 1920 (BY MONTHS).

1920.	Plantations.	Parás.	Africans.	Centrals.	Guayule.	Maniçoba and Matto Grosso.	Totals for 3 Mons. 1920.	Totals for 3 Mons. 1919.
January ...tons	17,799	2,620	821	111	...	...	21,351	7,235
February	29,681	2,456	558	265	34	...	32,994	17,456
March*	28,533	2,463	514	23	114	3	31,650	28,223
Totals	76,013	7,539	1,893	399	148	3	85,995	52,914

*Also in March, balata, 113 tons; miscellaneous gums, 983 tons; waste, 1,252 tons.

(*Compiled by The Rubber Association of America, Inc.*)

CRUDE RUBBER ARRIVALS AT ATLANTIC AND PACIFIC PORTS AS STATED BY SHIPS' MANIFESTS.

PARAS AND CAUCHO AT NEW YORK.

	Fine.	Medium	Coarse	Caucho.	Totals. Pounds.
MARCH 24. By the S. S. *St Bede*, from Pará.					
Poel & Kelly	....	....	31,193	....	31,193
G. Amsinck & Co., Inc	7,953	....	6,193	9,981	24,127
A. Volle & Co	65,824	11,220	48,826	....	125,870
Meyer & Brown, Inc	66,640	10,437	10,640	521	88,238
MARCH 26. By the S. S. *Polycarp*, from Pará.					
Poel & Kelly	50,664	11,248	29,402	28,787	120,101
Paul Bertuch	13,866	4,500	62,452	73,700	154,518
New York Overseas Co	....	....	....	....	980
Meyer & Brown, Inc	....	....	44,800	69,440	114,240
H. A. Astlett & Co	....	57,000	8,000	....	65,000
Aldens' Successors, Inc	....	11,278	9,562	554	21,394
Hagemeyer & Brunn	112,000	....	....	....	112,000
MARCH 27. By the S. S. *General W. C. Gorgas*, from Panama.					
W. R. Grace & Co	....	....	....	11,200	11,200
MARCH 27. By the S. S. *Manco*, from Pará and Manaos.					
Aldens' Successors, Inc	....	....	15,486	....	15,486
Meyer & Brown, Inc	56,000	52,640	....	....	108,640
Poel & Kelly	47,270	9,111	24,689	24,972	106,042
G. Amsinck & Co, Inc	51,240	14,580	68,400	....	134,220
Hagemeyer Trading Co	....	....	9,540	....	9,540
Neuss Hesslein & Co	....	....	....	....	1,475,280
Various	170,100	27,180	411,120	....	608,400
MARCH 27. By the S. S. *Manco*, from Iquitos.					
Meyer & Brown, Inc	53,900	....	20,500	15,100	89,500
E. T. Grenier	....	....	....	....	9,933
G. Amsinck & Co., Inc	....	....	....	....	9,519
H. A. Astlett & Co	29,700	....	83,000	155,000	267,700
Various	....	....	....	....	461,437
APRIL 11. By the S. S. *Byron*, from Pará.					
Poel & Kelly	....	....	....	....	16,366
Goldman, Sachs & Co	....	....	....	....	12,936
H. A. Astlett & Co	....	....	....	45,000	45,000
Meyer & Brown, Inc	66,640	....	1,680	22,960	91,280
Aldens' Successors, Inc	....	2,138	6,173	3,430	11,741
Hagemeyer & Brown	224,000	....	22,400	112,000	358,400
Paul Bertuch	....	....	25,463	....	25,463
APRIL 12. By the S. S. *Iver Heath*, from Montevideo.					
Laidlaw, Kelley & Co	....	....	....	....	18,032
Thornton & Co	....	....	....	....	4,508

PLANTATIONS.

(Figured 180 pounds to the bale, or case.)

	Shipment from:	Shipped to:	Pounds.	Totals.
MARCH 9. By the S. S. *Santa Cruz*, at San Francisco.				
Various	Singapore	San Fran.	638,280	
Various	Honolulu	San Fran.	638,280	1,276,560
MARCH 18. By the S. S. *Choyo Maru*, at San Francisco.				
Fred Stern & Co	Singapore	San Fran.	660,960	
Rubber Trading Co	Singapore	San Fran.	20,160	
J. T. Johnstone & Co., Inc.	Singapore	San Fran.	30,240	
Robert Dollar Co	Singapore	San Fran.	540	
Various	Singapore	San Fran.	164,520	
Various	Soerabaya	San Fran.	26,100	
Mitsui & Co., Limited	Soerabaya	San Fran.	99,540	
The Goodyear Tire & Rubber Co.	Batavia	Akron	256,860	
The B. F. Goodrich Co.	Batavia	Akron	102,780	
The Goodyear Tire & Rubber Co.	Soerabaya	Akron	231,660	
Firestone Tire & Rubber Co.	Penang	Akron	430,380	
Smith & Schippers	Singapore	San Fran.	85,680	
Firestone Tire & Rubber Co.	Singapore	Akron	432,360	
Various	Batavia	San Fran.	26,280	2,568,060
MARCH 19. By the S. S. *West Caddoa*, at San Francisco.				
Firestone Tire & Rubber Co.	Penang	Akron	1,001,880	
F. R. Henderson & Co.	Penang	San Fran.	252,000	
Edward Boustead & Co.	Penang	San Fran.	86,400	1,340,280
MARCH 24. By the S. S. *Myrmidon*, at New York.				
F. R. Henderson & Co.	Soerabaya	New York	70,920	
Fred Stern & Co	Soerabaya	New York	224,000	
Various	Batavia	New York	727,760	1,022,680
MARCH 25. By the S. S. *Anglo Egyptian*, at New York.				
Poel & Kelly	Liverpool	New York	2,160	
Fred Stern & Co	Liverpool	New York	29,700	31,860
MARCH 25. By the S. S. *Defiance*, at New York.				
Chas. T. Wilson Co., Inc.	London	New York	30,060	
T. D. Downing & Co	London	New York	92,880	
Meyer & Brown, Inc	London	New York	86,240	
Aldens' Successors, Inc.	London	New York	202,284	
Fred Stern & Co	London	New York	22,456	
Various	London	New York	647,284	1,081,204
MARCH 27. By the S. S. *Port Hacking*, at New York.				
T. D. Downing & Co	London	New York	160,920	
Various	London	New York	166,680	327,600
MARCH 27. By the S. S. *Maneric*, at New York.				
Hood Rubber Co	Far East	Watertown	22,500	22,500
MARCH 27. By the S. S. *Arabian Prince*, at New York.				
Adolph Hirsch & Co	Singapore	New York	61,000	
Poel & Kelly	Singapore	New York	628,840	
Aldens' Successors, Inc.	Singapore	New York	22,468	
The B. F. Goodrich Co.	Singapore	Akron	41,400	
L. Littlejohn & Co., Inc.	Singapore	New York	277,200	
Bright & Golbrith	Singapore	New York	38,520	
Rubber Importers' & Dealers' Co., Inc	Singapore	New York	405,100	
Winter, Ross & Co	Singapore	New York	50,400	
Chas. T. Wilson Co., Inc.	Singapore	New York	278,180	
William H. Stiles & Co.	Singapore	New York	54,800	
Edward Maurer Co., Inc.	Singapore	New York	24,000	
Thos. A. Desmond & Co.	Singapore	New York	53,568	
Hadden & Co	Singapore	New York	127,080	
Fred Stern & Co	Singapore	New York	413,200	
Mitsui & Co., Limited	Singapore	New York	106,560	
Rogers-Pyatt Shellac Co.	Singapore	New York	135,000	
The Fish Rubber Co	Singapore	Chicopee Falls	272,700	
Meyer & Brown, Inc	Singapore	New York	246,400	
General Rubber Co	Singapore	New York	1,107,540	
The Goodyear Tire & Rubber Co.	Singapore	Akron	394,560	
Balfour, Williamson & Co.	Singapore	New York	11,520	
Thornett & Fehr, Inc.	Singapore	New York	92,980	
F. R. Henderson & Co.	Singapore	New York	45,000	
Rubber Trading Co	Singapore	New York	78,400	
W. R. Grace & Co	Singapore	New York	56,000	
Various	Singapore	New York	1,888,620	6,911,036
MARCH 28. Transhipped from the S. S. *Arakan* from Soerabaya, at San Francisco.				
L. Littlejohn & Co., Inc.	Soerabaya	New York	250,920	
L. Littlejohn & Co., Inc.	Batavia	New York	1,440	
Spreckels "Savage" Tire Co.	Batavia	San Diego	34,560	
Firestone Tire & Rubber Co.	Batavia	Akron	27,360	
Various	Soerabaya	San Diego	21,240	
Various	Soerabaya	Seattle	3,760	339,280
MARCH 29. By the S. S. *Akron*, at New York.				
L. Littlejohn & Co., Inc.	Colombo	New York	127,620	
United States Rubber Co.	Colombo	New York	540,000	
Firestone Tire & Rubber Co.	Colombo	New York	84,600	
Poel & Kelly	Colombo	New York	160,560	
J. Aron & Co	Colombo	New York	38,520	
Rubber Trading Co	Singapore	New York	22,400	973,700
MARCH 30. By the S. S. *Iconium*, at Seattle.				
Firestone Tire & Rubber Co.	Penang	Akro	370,800	
Gates Rubber Co	Singapore	Denver	102,780	
Various	Singapore	Tacoma	22,680	496,260
MARCH 31. By the S. S. *Bellbuckle*, at New York.				
Various	Melbourne	New York	11,520	11,520
APRIL 1. By the S. S. *Koyo Maru*, at San Francisco.				
Mitsui & Co., Limited	Singapore	New York	57,600	
Firestone Tire & Rubber Co.	Singapore	Akron	599,560	
Gates Rubber Co	Singapore	Denver	340,020	
Various	Singapore	San Diego	22,500	
Smith & Schippers	Penang	New York	47,880	
F. R. Henderson & Co.	Penang	New York	22,680	
Various	Penang	Akron	209,880	1,300,120
APRIL 1. By the S. S. *Vennonia*, at New York.				
Poel & Kelly	London	New York	129,060	
The B. F. Goodrich Co.	London	Akron	311,040	
Smith & Schippers	London	New York	211,680	
Mitsui & Co., Limited	London	New York	191,340	
T. D. Downing & Co	London	New York	116,280	
Meyer & Brown, Inc	London	New York	48,160	
Various	London	New York	905,660	1,913,220
APRIL 2. By the S. S. *Saxonia*, at New York.				
L. Sutro & Co	London	New York	46,080	
General Rubber Co	London	New York	72,360	
Various	London	New York	80,100	198,540
APRIL 2. By the S. S. *Manitou*, at New York.				
Thornett & Fehr, Inc.	Liverpool	New York	3,420	3,420
APRIL 5. By the S. S. *Nitonian*, at Boston.				
Hood Rubber Co	London	Watertown	44,473	44,473
APRIL 5. By the S. S. *City of Lahore*, at New York.				
Thornett & Fehr, Inc.	Colombo	New York	11,520	
C. C. Trevanion & Co.	Colombo	New York	146,880	
United States Rubber Co	Colombo	New York	155,520	
The Goodyear Tire & Rubber Co.	Colombo	Akron	65,880	
Chas. T. Wilson Co, Inc.	Colombo	New York	54,360	
L. Littlejohn & Co, Inc.	Colombo	New York	65,340	
Rubber Trading Co	Colombo	New York	67,200	
Fred Stern & Co	Colombo	New York	22,400	
Various	Colombo	New York	313,240	902,340
APRIL 6. By the S. S. *Minnekahda*, at New York.				
T. D. Downing & Co	London	New York	89,100	
Meyer & Brown, Inc	London	New York	56,000	
Various	London	New York	284,020	429,120
APRIL 6. By the S. S. *Venusia*, at Portland, Maine				
Meyer & Brown, Inc	London	New York	67,200	67,200
APRIL 7. By the S. S. *Meranke*, at New York.				
Stein, Hall & Co., Inc.	Soerabaya	New York	112,860	
L. Littlejohn & Co., Inc.	Soerabaya	New York	666,540	
Goldman, Sachs & Co	Soerabaya	New York	24,300	

	Shipment from:	Shipped to.	Pounds	Totals
The Goodyear Tire & Rubber Co.	Soerabaya	New York	69,300	
Thornett & Fehr, Inc....	Soerabaya	New York	17,100	
Java-Holland American Trading Co.	Soerabaya	New York	10,080	
Poel & Kelly..........	Soerabaya	New York	111,420	
Manhattan Rubber Manufacturing Co.	Soerabaya	New York	27,000	
L. Sutro & Co..........	Soerabaya	New York	180	
E. Everett, Carleton & Co.	Soerabaya	New York	44,640	
Poel & Kelly..........	T'jong Priok	New York	39,060	
Fred Stern & Co........	T'jong Priok	New York	167,320	
The Goodyear Tire & Rubber Co.	T'jong Priok	Akron	261,000	
General Rubber Co......	T'jong Priok	New York	7,200	
Fred Stern & Co........	Sourabaya	New York	156,800	
Various	T'jong Priok	New York	142,740	
Aldens' Successors, Inc..	Bolivia	New York	66,138	1,923,678
April 8. By the S. S. *Manhattan*, at New York.				
T. D. Downing & Co....	London	New York	270,900	
Thornett & Fehr, Inc...	London	New York	182,340	
Aldens' Successors, Inc..	London	New York	733,176	
Various	London	New York	215,424	1,401,840
April 8. By the S. S. *Tenyo Maru*, at San Francisco.				
Various	Hongkong	San Francisco	36,360	
Various	Honolulu	East. Cities	36,360	72,720
April 9. By the S. S. *Philadelphia*, at New York.				
The Goodyear Tire & Rubber Co.	Southampton	Akron	232,200	
Various	Southampton	New York	124,020	356,220
April 9. By the S S. *Clan Monroe*, at New York.				
United States Rubber Co.	Colombo	New York	216,000	
L. Littlejohn & Co., Inc.	Colombo	New York	16,020	
Chas. T. Wilson Co., Inc.	Colombo	New York	28,980	
Poel & Kelly...........	Colombo	New York	74,160	
T. M. Duche & Sons....	Colombo	New York	7,120	
Meyer & Brown, Inc....	Colombo	New York	56,000	
Poel & Kelly...........	Cochin	New York	51,660	
Fred Stern & Co........	Cochin	New York	168,000	
Balfour, Williamson & Co.	Cochin	New York	30,960	
C. C. Trevanion & Co...	Cochin	New York	7,740	
Dunlop Rubber Co., Limited	Cochin	New York	80,640	
Vernon Metal & Produce Co.	Cochin	New York	57,780	
W. J. McDavid & Co., Inc.	Cochin	New York	10,980	
Various	Cochin	New York	183,420	
Rubber Trading Co.....	Colombo	New York	6,720	996,180
April 9. By the S. S. *Matura*, at New York.				
Middleton & Co., Limited.	Trinidad	New York	1,135	1,135
April 12. By the S. S. *Port Elliot*, at New York.				
Poel & Kelly...........	London	New York	125,820	
Mitsui & Co., Limited...	London	New York	243,360	
Baring Brothers	London	New York	484,740	
T. D. Downing & Co....	London	New York	464,400	
General Rubber Co......	London	New York	624,820	
The B. F. Goodrich Co..	London	Akron	250,380	
Various	London	New York	554,500	2,748,020
April 12. By the S. S. *Eastern Coast*, at New York.				
Pacific Trading Corp. of America	Singapore	New York	42,840	
Raw Products Co.......	Singapore	New York	18,000	
Fred Stern & Co........	Singapore	New York	98,280	
Various	Singapore	New York	84,280	243,400
April 12. By the S. S. *Baltic*, at New York.				
Various	Liverpool	New York	46,080	46,080
April 12. By the S. S. *Verbania*, at New York.				
General Rubber Co......	Liverpool	New York	64,440	
Poel & Kelly...........	Liverpool	New York	297,360	361,800
April 12. By the S. S. *Bondowasso*, at San Francisco.				
Firestone Tire & Rubber Co.	Soerabaya	Akron	34,200	
L. Littlejohn & Co., Inc..	Soerabaya	New York	89,100	
Various	Soerabaya	San Francisco	111,240	234,540
April 12. By the S. S. *Kentucky*, at New York,				
Chas. T. Wilson Co., Inc.	Colombo	New York	48,600	
Baring Brothers	Colombo	New York	20,160	
United States Rubber Co.	Colombo	New York	114,840	
The Goodyear Tire & Rubber Co.	Colombo	Akron	82,800	
Poel & Kelly...........	Colombo	New York	113,940	
L. Littlejohn & Co., Inc.	Colombo	New York	91,080	
H. P. Winter & Co.....	Colombo	New York	36,000	
E. S. Kuh &Volk Co....	Colombo	New York	21,240	
Meyer & Brown, Inc....	Colombo	New York	44,800	
Rubber Trading Co.....	Singapore	New York	22,400	
Fred Stern & Co.......	Colombo	New York	56,000	
Various	Colombo	New York	305,300	957,160
April 14. By the S. S. *Ida*, at New York.				
Rubber Importers & Dealers Co., Inc......	Singapore	New York	354,060	
Hood Rubber Co.......	Singapore	Watertown	67,500	
The Goodyear Tire & Rubber Co.	Singapore	Akron	67,500	489,060
April 15. By the S. S. *Start Point*, at St. Johns, N. B.				
Meyer & Brown, Inc....	London	New York	33,600	33,600
April 15. By the S. S. *Grace Dollar*, at New York.				
F. R. Henderson & Co..	Singapore	New York	121,140	
Rogers-Pyatt Shellac Co.	Singapore	New York	248,580	
T. D. Desmond & Co....	Singapore	New York	102,240	
The Fisk Rubber Co....	Singapore	Chic'pee Falls	272,880	
Goldman, Sachs & Co....	Singapore	New York	614,880	
Meyer & Brown, Inc....	Singapore	New York	929,600	
Pell & Dumont, Inc.....	Singapore	New York	33,480	
The B. F. Goodrich Co..	Singapore	New York	245,520	
Mitsui & Co., Limited...	Singapore	New York	60,480	
Frank Waterhouse & Co.	Singapore	New York	28,800	
The Goodyear Tire & Rubber Co.	Singapore	New York	514,080	
Fred Stern & Co........	Singapore	New York	27,540	
L. Littlejohn & Co., Inc.	Singapore	New York	260,460	
The United Malaysian Rubber Co., Limited...	Singapore	New York	67,200	
Hadden & Co...........	Singapore	New York	69,120	
Mitsui & Co., Limited...	Penang	New York	144,180	
C. F. McPhillips........	Penang	New York	18,440	
Mitsubishi Goshi Kaisha.	Penang	New York	56,700	
General Rubber Co......	Penang	New York	1,078,740	
Rubber Importers & Dealers Co.	Penang	New York	224,000	
The Fisk Rubber Co....	Medan	Chic'p'e Falls	21,240	
General Rubber Co......	Medan	New York	34,560	
Aldens' Successors, Inc..	Port Swet'n'm	New York	68,400	
Various	Penang	New York	165,240	
Rubber Trading Co......	Singapore	New York	11,200	
Aldens' Successors, Inc..	Singapore	New York	270,160	
W. R. Grace & Co......	Singapore	New York	113,930	
Various	Singapore	New York	556,870	6,359,660
April 17. By the S S *Celtic Prince*, at New York.				
F. R. Henderson & Co..	Singapore	New York	787,860	
Rogers-Pyatt Shellac Co.	Singapore	New York	147,600	
Thos. A. Desmond & Co.	Singapore	New York	373,500	
L. Littlejohn & Co., Inc.	Singapore	New York	143,280	
Joosten & Janssen.......	Singapore	New York	65,880	
Rubber Importers & Dealers Co., Inc.....	Singapore	New York	705,600	
The B. F. Goodrich Co.	Singapore	Akron	72,540	
Balfour, Williamson & Co.	Singapore	New York	138,240	
Aldens' Successors, Inc..	Singapore	New York	119,854	
Meyer & Brown, Inc....	Singapore	New York	27,000	
W. G. Ryckman, Inc....	Singapore	New York	43,200	
The Goodyear Tire & Rubber Co.	Singapore	New York	428,580	
Vernon Metal & Produce Co.	Singapore	New York	80,640	
Fred Stern & Co.......	Singapore	New York	268,000	
Poel & Kelly..........	Singapore	New York	12,600	
Firestone Tire & Rubber Co.	Singapore	Akron	195,840	
Thornett & Fehr, Inc....	Singapore	New York	54,000	
Meyer & Brown, Inc....	Singapore	New York	44,800	
The United Malaysian Rubber Co., Limited..	Singapore	New York	67,200	
Various	Singapore	New York	2,628,600	6,404,814
April 19. By the S. S. *Egremont Castle*, at New York.				
W. R. Grace & Co......	Singapore	New York	56,000	
Fred Stern & Co.......	Singapore	New York	224,000	
Rubber Importers & Dealers Co., Inc.....	Singapore	New York	22,400	
Rubber Trading Co.....	Singapore	New York	71,680	
Meyer & Brown, Inc....	Singapore	New York	11,200	
Edward Maurer Co., Inc.	Penang	New York	14,400	
William H. Stiles & Co..	Penang	New York	49,500	
Thornett & Fehr, Inc...	Penang	New York	49,500	
Aldens' Successors, Inc.	Penang	New York	95,943	
Mitsui & Co., Limited...	Penang	New York	22,680	
C. F McPhillips........	Penang	New York	28,620	
Various	Penang	New York	329,940	
Various	Singapore	New York	3,124,000	4,099,863
April 20. By the S. S. *Atreus*, at New York.				
Hood Rubber Co.......	Far East	Watertown	112,000	112,000
April 22. By the S. S. *Tyndareus*, at Seattle.				
Fred Stern & Co........	Singapore	New York	112,000	112,000

CENTRALS.

March 26. By the S. S. *General O. H. Ernst*, at New York.				
Ogerdan Co.	Cristobal	New York	300	300
March 27. By the S. S. *General W. C. Gorgas*, at New York.				
G. Amsinck & Co., Inc..	Cristobal	New York	3,600	
Andean Trading Co....	Cristobal	New York	15,000	18,600
March 27. By the S. S. *Ancon*, at New York.				
G. Amsinck & Co., Inc..	Cristobal	New York	4,500	
Ultramares Corp.	Cristobal	New York	3,000	
Mecke & Co............	Cristobal	New York	3,200	
Various	Cristobal	New York	2,250	53,450
April 5. By the S. S. *Frednes*, at New York.				
Ultramares Corp.	Columbia	New York	8,250	
Cortissan & Co.........	Columbia	New York	600	8,850
April 6. By the S. S. *Gen. G. W. Goethals*, at New York.				
Wellman, Peck & Co....	Cristobal	New York	1,500	
Mecke & Co...........	Cristobal	New York	8,100	
Various	Cristobal	New York	2,160	11,760
April 8. By the S. S. *Jacinto*, at New York.				
Tauman & Kamp.......	Vera Cruz	New York	2,850	2,850
April 12. By the S. S. *W. M. Tupper*, at New York.				
Ultramares Corp........	Cartagenia	New York	4,950	4,950
April 16. By the S. S. *Panama*, at New York.				
G. Amsinck & Co., Inc..	Cristobal	New York	46,050	
M. A. de Lion & Co....	Cristobal	New York	150	46,200

	Shipment from:	Shipped to:	Pounds.	Totals.
APRIL 19. By the S. S. *Egremont Castle*, at New York.				
Aldens' Successors, Inc.	Colombo	New York	19,800	
Chas. J. Wilson Co., Inc.	Colombo	New York	172,950	192,750
APRIL 19. By the S. S. *Matura*, at New York				
Middleton & Co.	Trinidad	New York	1,800	1,800
AFRICANS.				
MARCH 24. By the S. S. *East Side*, at New York.				
Various	Bordeaux	New York	84,055	84,055
MARCH 25. By the S. S. *Roma*, at New York				
Various	Marseilles	New York	460	460
APRIL 6. By the S. S. *Royal Prince*, at New York.				
Various	Havre	New York	252,582	252,582
APRIL 7. By the S. S. *Ascoda*, at New York.				
Poel & Kelly	Bordeaux	New York	211,031	
S. S. Pierce & Co	Bordeaux	Boston	482,658	
Rubber Importers & Dealers Co., Inc	Bordeaux	New York	134,400	
Various			874,520	1,702,609
APRIL 12. By the S. S. *Britannia*, at New York.				
Various	Marseilles	New York	311,580	311,580
GUTTA PERCHA.				
MARCH 27. By the S. S. *Arabian Prince*, at New York.				
Louis Windmuller & Roelker	Singapore	New York	1,500	1,500
APRIL 2. By the S. S. *Saxonia*, at New York.				
Various	London	New York	30,900	30,900
APRIL 13. By the S. S. *Remier*, at New York.				
Hadden & Co	Rouen	New York	46,200	46,200
APRIL 19. By the S. S. *Celtic Prince*, at New York.				
The United Malaysian Rubber Co., Limited	Singapore	New York	55,729	55,729
APRIL 19. By the S. S. *Egremont Castle*, at New York.				
Various	Singapore	New York	42,600	42,600
GUTTA SIAK.				
MARCH 27. By the S. S. *Arabian Prince*, at New York.				
The United Malaysian Rubber Co., Limited	Singapore	New York	100,800	100,800
APRIL 17. By the S. S. *Celtic Prince*, at New York.				
The United Malaysian Rubber Co., Limited	Singapore	New York	67,200	
L. Littlejohn & Co., Inc.	Singapore	New York	8,600	75,800
APRIL 19. By the S. S. *Egremont Castle*, at New York.				
Various	Singapore	New York	37,800	37,800
GUTTAS.				
MARCH 25. By the S. S. *Anglo Egyptian*, at New York				
Fred Stern & Co	London	New York	15,000	15,000
GUAYULE.				
MARCH 25. By Rail at Eagle Pass, Texas				
Continental Mexican Rubber Co.	Mexico	Akron	99,000	99,000
BALATA.				
APRIL 2. By the S. S. *Maraval*, at New York.				
Middleton & Co., Ltd	Trinidad	New York	16,580	
General Export & Commission Co.	Trinidad	New York	10,800	27,380
APRIL 6. By the S. S. *Gen. G. W. Goethals*, at New York.				
Ultramares Corp.	Cristobal	New York	600	
Piza Nephews & Co	Cristobal	New York	2,700	3,300
APRIL 16. By the S. S. *Panama*, at New York.				
H. Marquardt & Co., Inc.	Cristobal	New York	9,750	9,750
APRIL 17. By the S. S. *Nickerie*, at New York.				
Aikell & Douglas, Inc	Paramarito	New York	10,094	10,094
APRIL 19. By the S. S. *Matura*, at New York.				
Middleton & Co., Limited.	Trinidad	New York	2,942	2,942
PONTIANAK.				
MARCH 27. By the S. S. *Arabian Prince*, at New York.				
Borneo Sumatra Trading Co.	Singapore	New York	115,800	
The United Malaysian Rubber Co., Limited	Singapore	New York	101,545	217,345
APRIL 7. By the S. S. *Meranke*, at New York.				
The United Malaysian Rubber Co., Limited	Singapore	New York	77,100	77,100
APRIL 15. By the S. S. *Grace Dollar*, at New York.				
The United Malaysian Rubber Co., Limited	Singapore	New York	366,905	366,905
APRIL 17. By the S. S. *Celtic Prince*, at New York.				
The United Malaysian Rubber Co., Limited	Singapore	New York	225,000	
Fred Stern & Co	Singapore	New York	28,000	
L. Littlejohn & Co., Inc.	Singapore	New York	55,500	
Various	Singapore	New York	84,700	393,200
APRIL 19. By the S. S. *Egremont Castle* at New York.				
Various	Singapore	New York	55,500	55,500

THE FUTURE OF THE RUBBER MARKET.

W. H. RICKINSON & SON, of London, supply the following information to assist those who are desirous of making a forecast of the world's future production and consumption of crude rubber:

Taking the actual world's consumption of rubber during 1919 at 320,000 tons, an annual increase of 15 per cent would raise the demand to 643,634 tons in 1924. To meet this, plantation estates would have to yield an average of between 450 and 475 pounds per acre (see Table C).

Consumption of rubber in the United States has shown an average annual increase of 27.7 per cent during the past ten years (see Table F).

The increased demand for rubber in the United States during the war was mainly for home consumption.

Should an increasing world demand be maintained at about 25 per cent per annum, it would necessitate a yield from the whole planted area in bearing of 716 pounds per acre to meet it. It takes a shorter period to increase output on estates from 200 pounds to 300 pounds per acre, than from 300 pounds to 400 pounds.

Most of the rubber produced is used for the manufacture of tires, and if this demand is maintained during the next few years there will not be enough rubber available, as only the present planted area (2,910,750 acres) will be tappable during the next five years.

The average production during the last five years from Brazil has been 35,171 tons, and of wild rubber for the same period 10,197 tons.

The central European countries were large consumers before the war and during the next few years their requirements will no doubt be renewed on an increasing scale.

The largest tire manufacturer in the world—an American concern—contemplates increasing its output this year by 30 per cent over 1919.

As far as can be judged at the present time the years 1921-1923 will be as interesting for the rubber industry as were the years 1909-1911.

PLANTATION PRODUCTION.

Table A.

ACTUAL.

	Acres in Bearing.	Tons.	Pounds Per Acre in Bearing.	Annual Increase of Area in Bearing.
1910	116,500	8,200	= 157	—
1911	294,200	14,419	= 109	139.6%
1912	506,550	28,518	= 126	72.1%
1913	687,350	47,618	= 155	35.6%
1914	861,150	71,380	= 185	25.3%
1915	1,122,550	107,867	= 215	30.3%
1916	1,505,350	152,650	= 227	34.1%
1917	1,817,350	213,070	= 262	20.7%
1918	2,021,750	255,950	= 283	11.2%
1919	2,181,050	285,225	= 293	7.8%

Table B.

FOR ESTIMATING.

This table is intended to assist in arriving at a forecast of the Plantation production for the years 1920-1924 inclusive, according to the pounds per planted acre in bearing assumed to be yielded and indicated in the figures at the head of each column.

Pounds Per Acre.	350.	375.	400.	425.	450.	475.	500.	550.	600.	Acres in Bearing.	
1920	358,399	383,998	409,598	435,198	460,798	486,398	511,997	563,196	614,397	2,293,750	5.2%
1921	384,211	411,635	439,098	466,541	493,985	521,429	548,872	603,759	658,647	2,458,950	7.2%
1922	408,023	437,168	466,312	495,456	524,601	553,746	582,890	641,179	699,468	2,611,350	6.2%
1923	431,242	462,045	492,848	523,651	554,454	585,257	616,060	677,666	739,272	2,759,950	5.6%
1924	454,804	487,290	519,776	552,262	584,748	617,234	649,720	714,692	779,664	2,910,750	5.4%
		7.1%	6.6%	6.2%	5.8%	5.6%	5.2%	10%	9%	Percentage of Increase.	

Table C.
WORLD'S PRODUCTION.

45,000 tons are here apportioned annually for rubber other than plantation grown, i.e., 35,000 tons as coming from Brazil and 10,000 tons of wild rubber as coming from Africa, Central America, Mexico and other parts of the world. These quantities are added to the figures in Table B, and the results found in the columns below indicate the world's total production according to the pounds per planted acre in bearing assumed to be yielded by the plantations.

	*350	*375	*400	*425	*450	*475	*500	*550	*600
1920 . . . . tons	403,399	428,998	454,598	480,198	505,798	531,398	556,997	608,196	659,397
1921	429,211	456,635	484,098	511,541	538,985	566,429	593,872	648,759	703,647
1922	453,023	482,168	511,312	540,456	569,601	598,746	627,890	686,179	744,468
1923	476,242	507,045	537,848	568,651	599,454	630,257	661,060	722,666	784,272
1924	499,804	532,290	564,776	597,262	629,748	662,234	694,720	759,692	824,664

*Pounds per acre yield of plantation rubber in bearing.

Table D.
WORLD'S CONSUMPTION.

(On the basis of an actual consumption of 320,000 tons in 1919.)

PERCENTAGE OF ANNUAL INCREASE	5%	10%	15%	20%	25%	30%	35%	40%
1920 . . . . tons	336,000	352,000	368,000	384,000	400,000	416,000	432,000	448,000
1921	352,800	387,200	423,200	460,800	500,000	540,800	583,200	627,200
1922	370,440	425,920	486,680	552,960	625,000	703,040	787,320	882,080
1923	388,962	468,512	559,682	663,552	781,250	913,952	1,062,882	1,234,912
1924	408,410	515,363	643,634	796,262	976,562	1,188,137	1,434,892	1,728,876

Table E.
DISTRIBUTION DURING 1913-19.

	1913.	1914.	1915.	1916.	1917.	1918.	1919.
America . . . . tons	49,851	61 . 49	96,792	116,475	177,088	142,772	217,000
Great Britain	18,640	18,000	15,072	26,760	25,983	30,104	42,520
Russia	9,000	11,610	10,000	7,500	7,500	2,000	1,500
Germany } Austria }	18,500	13,400	6,000	3,600	3,000	1,000	4,000
France	6,500	5,000	10,770	14,000	17,000	18,000	22,000
Italy, etc.	2,000	4,000	6,500	9,000	9,000	9,800	14,000
Scandinavia	1,500	2,400	6,568	4,525	5,323	5,000	7,000
Japan } Australia }	1,300	2,400	2,500	4,500	4,506	7,400	12,000
Canada	2,000	1,700	4,500	4,000	6,287	8,300	9,500
Belgium	3,000	630	. . . . . .	. . . . . .	. . . . . .	. . . . . .	5,000
Totals	112,291	120,380	158,702	189,760	255,675	224,376	334,520

Table F.
UNITED STATES OF AMERICA

	1918.			1919.		
	IMPORTS.	EXPORTS.	RETAINED.	IMPORTS.	EXPORTS	RETAINED.
January	11,293	569	10,724	10,285	85	10,200
February	13,177	183	12,994	14,958	135	14,823
March	12,433	465	11,968	28,857	180	28,677
April	14,738	427	14,311	27,574	193	27,381
May	21,961	402	21,559	24,767	167	24,600
June	15,038	309	14,729	16,354	169	16,185
July	18,062	135	17,927	23,499	195	23,304
August	9,583	102	9,481	10,027	113	9,914
September	9,179	33	9,146	13,747	225	13,522
October	6,795	44	6,751	19,520	285	19,235
November	6,773	53	6,720	15,674	134	15,540*
December	6,485	23	6,462	13,830	211	13,619*
Totals	145,517	2,745	145,772	219,092	2,092	217,000

*Estimated.

RUBBER RETAINED (IN TONS).

		Increase (+) or Decrease (−). (In tons.)	(Percentage.)
1910	31,576	—	—
1911	29,235	— 2,341	— 7.4
1912	50,248	+21,013	+71.8
1913	49,851	— 397	— .8
1914	61,249	+11,398	+22.8
1915	96,792	+35,543	+58.0
1916	116,475	+19,633	+20.3
1917	177,088	+60,613	+52.0
1918	†142,772	—35,571	—19.3
1919	*217,000	+74,228	+51.9

The average increase for the above ten years has been 27.7 per cent per annum.

†Owing to shortage of shipping facilities.
*Partly estimated.

Table G.
RETAINED MONTHLY BY THE UNITED STATES AND BY GREAT BRITAIN.

	1918.				1919			
	United States.	Great Britain.	Plantation Price per lb.—shillings. Highest.	Lowest.	United States.	Great Britain.	Plantation Price per lb.—shillings. Highest.	Lowest.
January . . . . tons	10,724	6,489	2/6¼	2/3¾	10,200	4,232	2/ 2¾	2/ 0
February	12,994	4,400	2/5	2/3	14,823	2,853	2/ 1¾	2/ 0¼
March	11,968	901	2/6¾	2/4¾	28,677	3,625	2/ 1¼	2/ 0
April	14,311	3,922	2/6½	2/4	27,381	12,030	2/ 0¼	1/10½
May	21,559	-2,143	2/4¾	2/2	24,600	6,301	1/11½	1/10½
June	14,729	969	2/3	2/1	16,185	6,066	1/10½	1/ 7
July	17,927	2,773	2/3	2/1½	23,304	4,296	1/11¾	1/ 9¼
August	9,481	1,154	2/2	2/1	9,914	225	2/ 1½	1/11
September	9,146	2,896	2/3	2/1½	13,522	1,433	2/ 4¾	2/ 1½
October	6,751	786	2/5½	2/2½	19,235	384	2/ 4¼	2/ 2¼
November	6,720	2,984	2/6	2/4½	*15,540	-401	2/ 6	2/ 4½
December	6,462	4,973	2/4¼	2/2½	*13,619	1,476	2/11	2/ 5½
Total	142,772	30,104	Average	2/3½	217,000	42,520	Average	2/ 1¼

The United States of America consume about 60 per cent of the world's total rubber production. Whenever the supply exceeds the demand, Great Britain is the "dumping ground," and the price of rubber is affected accordingly.

*Estimated.

Table H.
FLUCTUATIONS, ETC., IN THE PRICE DURING 1909-19.
PLANTATION (Best Crêpe).

	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916	1917.	1918.	1919.
Highest . . . . shillings	9/3	12/9	7/3	5/9	4/6½	3/0	4/1½	4/3½	3/4½	2/6¾	2/11
Lowest	5/3	5/7	4/6	4/1	2/0	1/11½	1/11¾	2/1¾	2/2¾	2/1	1/7
Average	7/1	8/9	5/5½	4/9	3/0¼	2/3½	2/6	2/10¼	2/9¾	2/3½	2/1¼

PARA (Fine Hard) RUBBER.

	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.	1919.
Highest . . . . shillings	9/1½	12/6½	7/2	5/2½	4/7	3/2¼	3/8¼	4/1	3/5	3/8	2/8
Lowest	5/0	5/10	3/10	4/3	3/0½	2/6	2/4½	2/7¼	2/5½	2/7	2/4¼
Average	6/11	8/10	5/0	4/10	3/8	2/10½	2/7	3/1½	3/1¾	2/11½	2/5½

The foregoing statistics should be of assistance in forming an idea as to whether or not the future will bring a shortage in the world's rubber production.

RUBBER STATISTICS FOR ITALY.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	Ten Months Ended October 31.			
	1918.		1919.	
UNMANUFACTURED—	Quintals.[1]	Lire.[2]	Quintals.	Lire.
India rubber and gutta percha—raw and reclaimed				
From Great Britain	7,155		132	
Straits Settlements	26,875		42,376	
British India and Ceylon	5,760		24,267	
French African Colonies	4,993	65,474,850	3,282	103,405,050
Belgian Congo	251		825	..
Brazil	14,468		26,218	
Other countries	2,885		1,381	
Rubber scrap	1,841	331,380	14,790	2,646,000
Totals, unmanufactured	64,198	65,806,230	113,271	106,051,050
MANUFACTURED—				
India rubber and gutta percha—				
Threads	589	1,531,400	188	488,800
Sheets, including hard rubber	118	342,600	213	197,200
Tubes				
Inner tubes	4	10,400	9	23,400
Hose	104	135,200	155	201,500
Other forms	2	2,400	22	26,400
Belting	455	637,000	450	630,000
Rubber coated fabrics—*pieces*:				
For carding combs	216	345,600	337	539,200
Other forms	9	13,500	98	147,000
Boots and shoes ... *pairs*	31,510	472,650	42,030	630,450
Elastic webbing	194	543,000	290	812,000
Clothing and articles for travel	15	48,000	4	12,800
Manufactures of india rubber and gutta percha, n. e. s.:				
From cut sheets	28	78,400	33	92,400
Elastic fabric	1,259	2,140,300	3,395	5,771,500
Tires and tubes:				
From France	2,201		3,634	
Great Britain	446	6,355,000	971	11,275,200
Other countries	1		93	
Other rubber manufactures:				
From France	1,830		237	
Great Britain	2,661		9,043	
United States	223	7,075,500	154	14,157,000
Other countries	3		4	
Totals, manufactured	......	19,730,950	......	35,004,850
Total imports	......	85,537,180	......	141,055,900

EXPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—				
India rubber and gutta percha—raw and reclaimed:	Quintals.	Lire.	Quintals.	Lire.
To Spain	1,394		2,122	
United States	1,134	1,011,200	2,078	1,680,400
Other countries	......		1	
Rubber scrap	......	......	4,060	......
Totals, unmanufctd.	2,528	1,011,200	8,261	1,680,400
MANUFACTURED—				
India rubber and gutta percha—				
Threads	59	159,300	431	1,163,700
Sheets, including hard rubber	69	112,100	80	147,900
Tubes:				
Inner tubes	19	49,400	50	130,000
Hose	197	236,400	325	390,000
Other forms	108	118,800	373	410,300
Belting	87	139,200	95	152,000
Rubber coated fabrics *pieces*	46	55,200	232	278,400
Boots and shoes ... *pairs*	......	......	64	960
Elastic Goods	969	2,907,000	741	2,223,000
Waterproofed goods	8	38,400	27	129,600
Tires and tubes				
To France	2,900		75	
Great Britain	1,773		4,400	
Spain	82		608	
Switzerland	2		1,614	
British Isles and Ceylon	291		907	
Dutch East Indies	441	13,186,000	241	22,528,500
Straits Settlements	....		176	
Australia	95		507	
Argentina	221		1,065	
Brazil	529		895	
Other countries	606		3,815	
Other rubber manufactures:				
To France	253		320	
Great Britain	112		122	
Spain	13		30	
Switzerland	153		259	
Egypt	30	1,541,400	33	4,969,400
Argentina	168		266	
Brazil	61		83	
Uruguay	14		54	
Other countries	227		2,321	
Totals manufactured	......	18,543,200	......	32,523,760
Total exports	......	19,554,400	......	34,691,360

[1] One quintal equals 220.46 pounds.
[2] One lire equals $0.193.

UNITED KINGDOM RUBBER STATISTICS.

IMPORTS.

	February.			
UNMANUFACTURED—	1919.		1920.	
Crude rubber:				
From—	Pounds.	Value.	Pounds.	Value.
Straits Settlements	2,899,800	£307,519	6,252,100	£793,729
Federated Malay States	2,647,400	308,953	7,557,000	936,944
British India	926,400	106,344	1,224,500	154,368
Ceylon and dependencies	3,509,700	385,537	4,105,500	506,041
Other Dutch possessions in Indian Seas	766,900	88,027	949,900	506,041
Dutch East Indies (except other Dutch possessions in Indian Seas)	....	.....	735,900	122,439
Other countries in East Indies and Pacific, not elsewhere specified	204,700	24,258	397,500	49,582
Brazil	2,036,900	232,667	3,400	300
Peru	194,900	21,405	......	......
South and Central America (except Brazil and Peru)	......	.....	36,100	4,034
West Africa:				
French West Africa	......	......	12,300	1,342
Gold Coast	14,200	784	3,300	240
Other parts of West Africa	171,100	15,529	198,600	14,870
East Africa, including Madagascar	102,500	12,243	17,600	2,045
Other countries	154,400	12,813	115,800	13,990
Totals	13,628,900	£1,516,074	21,608,600	£2,699,027
Waste and reclaimed rubber	242,600	8,135	1,206,900	18,857
Totals, unmanufactured	13,871,500	£1,524,209	22,815,500	£2,717,884
*Rubber substitutes	......	......	76,900	3,012
Gutta percha and balata	882,800	154,753	849,400	153,513

*Included in "Other Articles," Class III, T., prior to 1920.

MANUFACTURED—				
Boots and shoes . . *dozen pairs*	3,749	£6,592	19,035	£44,045
Waterproofed clothing	......	6	......	1,620
Insulated wire	......	11	......	965
Tires and tubes	......	79,650	......	496,511
Other rubber manufactures	......	44,637	......	53,985
Totals	......	£120,896	......	£597,126

EXPORTS.

UNMANUFACTURED—				
Waste and reclaimed rubber	300,800	£7,464	751,800	£24,573
Rubber substitutes	......	......	236,500	11,233
Totals	300,800	7,464	988,300	35,796
MANUFACTURED—				
Boots and shoes . . *dozen pairs*	10,456	13,713	15,017	31,577
Waterproofed clothing	......	67,175	......	199,560
Insulated wire	......	27,389	......	100,130
Submarine cables	......	39,618	......	39,814
Tires and tubes	......	164,741	......	445,099
Other rubber manufactures	......	130,989	......	294,292
Totals	......	414,225	......	1,110,472

EXPORTS—FOREIGN AND COLONIAL.

UNMANUFACTURED—				
Crude rubber:	Pounds.	Value.	Pounds.	Value.
To Belgium	62,600	£6,747	720,100	£82,657
France	1,906,400	209,459	1,800,900	239,870
Germany	......	......	226,100	26,061
Italy	695,300	84,220	559,300	72,521
Russia	......	......	34,000	4,255
Spain	4,600	575	6,500	750
Sweden, Norway and Denmark	400,700	55,363	201,000	24,094
Other European countries	9,000	1,094	85,300	11,000
United States	4,045,300	404,788	7,611,500	983,670
Canada	46,200	4,057	638,100	82,708
Other countries	67,300	11,048	138,700	16,345
Totals, rubber	7,237,400	777,351	12,021,500	1,543,931
Waste and reclaimed	......	......	18,800	425
Rubber substitutes	......	......	3,100	140
Gutta percha balata	17,800	3,672	95,100	19,282
Totals, unmanufactured	...	781,023	.....	1,563,778
MANUFACTURED—				
Boots and shoes . *dozen pairs*	......	......	4	48
Tires and tubes	......	9,450	......	4,741
Waterproof clothing	......	......	......	12
Insulated wire	......	5,174	......	......
Other rubber manufactures	......	2,580	......	2,714
Total	......	17,204	......	7,515

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES, DURING THE MONTH OF FEBRUARY, 1920.

EXPORTED TO—	Belting. Value.	Hose. Value.	Packing. Value.	Boots. Pairs.	Boots. Value.	Shoes. Pairs.	Shoes. Value.	Soles and Heels. Value.	Automobile Tires. Casings. Value.	Automobile Tires. Inner Tubes. Value.	Automobile Tires. Solid Tires. Value.	Automobile Tires. All Others. Value.	Insulated Wire and Cables. Value.	Druggists' Rubber Sundries. Value.	All Other Manufactures of Rubber. Value.	Totals. Value.
EUROPE:																
Austria		$3,334		11,865	$59,870				$6,614		$10.000					$79,818
Azores and Madeira Islands								$77						$38		115
Belgium	$87		$82			6,820	$4,351	127	90,465	$7,974	8,254	$530	$1,917		$14,611	128,398
Bulgaria									485						13	498
Denmark	666	99	980	503	2,510	71,650	73,516	1,658	125,391	8,880	2,449	3,855	7,244	3,105	23,699	254,052
Finland		282	1,150			85,110	64,912		8,330	115			236		1,260	76,285
France	4,589	159	726			54,982	30,780	10	248,044	6,257		3,127	1,238	5,882	33,554	334,366
Germany	251	332				11,877	21,702	22	47,540	159		28		205	4,522	74,761
Greece		991	40	60	165	672	370	120	19,573	932			1,291		1,183	24,665
Italy		271				12,085	10,436	26	231,184	3,282	1,386	360	124	459	1,859	249,327
Malta, Gozo, and Cyprus Islands										10						10
Netherlands	1,373	1,249	501			4,101	3,930	120	180,840	4,166	18,201	49	22,205	3,198	4,090	239,922
Norway	1,561	9,129	611	3,797	8,274	192,504	137,552	502	71,708	6,219	17,967		18,057		6,572	278,152
Portugal						600	484		20,558						57	21,099
Roumania	336		22			12,846	14,409		189,934	401			403		1,064	206,569
Spain			205			29,333	22,434	6,447	223,807	2,565	8,456	4,130	1,383	1,975	12,127	283,529
Sweden	5,337	3,040	1,448			2,431	2,250	7	196,617	12,720	14,274	48	220		3,598	239,529
Switzerland		360				27,373	18,845		60,886	1,166	222		3,507	655	4,937	90,578
Turkey in Europe		27		6,228	18,650	53,262	81,827		35,390		6,388				15	142,297
England	6,500	97,336	22,747	5,052	5,164	209,074	169,722	13,339	349,947	26,145	15,929	10,595	18,884	19,775	127,009	883,092
Scotland		12	375			25,136	16,447		5,757						1,865	24,456
Ireland									1,040							1,040
Poland and Danzig						2,000	2,385									2,385
Yugoslavia									1,383							1,383
TOTALS, EUROPE	$20,700	$116,621	$28,887	27,505	$94,633	801,856	$676,352	$22,455	$2,115,493	$80,991	$103,526	$22,662	$76,709	$35,292	$242,035	$3,636,356
NORTH AMERICA:																
Bermuda			$76	5	$24	36	$34	$273				$48		$10	$337	$802
British Honduras		$37						384	$788	$263			$57		188	1,717
Canada	$21,184	10,397	7,178	1,989	7,474	4,328	8,243	463	179,597	22,099	$14,326	520	16,173	22,312	167,513	477,479
Costa Rica	839	419	248					104	710	322		351	520	19	373	3,905
Guatemala	937	110	223			544	801	600	4,465	860			3,362	447	1,564	13,369
Honduras	166	336	463					484	2,728	51			929		374	5,531
Nicaragua	1,281	322	313					2,040	3,732				388	174	117	8,367
Panama	78	10,730	2,679	99	276	3,742	2,707	370	28,277	2,227	3,387	7,030	4,987	847	3,607	67,202
Salvador	1,111	338	56					3,010	5,108	680	3,258		36	110	672	14,379
Mexico	39,146	17,316	6,812	34	197	6,225	7,346	4,073	49,801	5,023	7,761	2,845	26,858	9,714	23,534	200,426
Newfoundland and Labrador	454	23		2,629	9,832	2,315	2,150	76	89	12			236		685	13,557
Barbados	5					370	419	31	1,309	178	40		151	24	209	2,366
Jamaica	30	136						958	16,174	1,262	1,814	15	127	102	622	21,240
Trinidad and Tobago	78	1,336	329			496	192	369	8,488	1,090	276	77	48[illegible]	845	463	14,025
Other British West Indies	67	28	106			483	611	25	1,522	15		6	105	41	67	2,593
Cuba	16,021	31,385	16,152			36,498	28,964	15,659	117,820	16,264	30,752	6,960	68,336	11,324	23,908	383,545
Danish West Indies			60			201	202	304	1,331	306	632		59		47	2,941
Dutch West Indies		242				48	35	57	1,406	38				49	293	2,120
French West Indies		166							9,960	1,218	657	35	58	479	6	12,579
Haiti	142	37	18					61	2,902	235	1,713	200	1,023	6	436	6,773
Dominican Republic	302	358	956			17	26	55	8,762	1,355	275	360	2,196	222	1,632	16,499
TOTALS, NORTH AMERICA	$81,841	$73,716	$35,669	4,747	$17,803	55,303	$51,730	$29,396	$444,969	$53,498	$64,891	$18,447	$126,083	$46,725	$226,647	$1,271,415
SOUTH AMERICA:																
Argentina	$4,806	$13,590	$480	66	$308	10,090	$7,990	$1,308	$233,283	$3,747	$2,035	$1,651	$28,565	$2,334	$15,084	$315,181
Bolivia	65								3,383	207	712		45	172	16	4,600
Brazil	8,903	16,737	2,970			40,352	34,010	4,111	140,216	24,316	279	417	242,770	7,450	22,716	504,895
Chile	2,164	3,448	285			11,508	7,398		44,832	527	6,838	15	6,494	2,532	7,435	81,968
Colombia	1,788	915	1,125			2,303	2,535	195	17,455	377	173		6,752	10,011	2,188	43,514
Ecuador		344				2,280	1,644		3,270	86		378	680	7	920	7,329
British Guiana						90	64		3,583	2,962	730		50		113	7,502
Dutch Guiana						48	29		567	11	290		330	10	937	2,174
Paraguay										93			38	180	178	489
Peru	862	9,897	582			21	34	135	12,822	497		211	11,125	229	8,684	45,078
Uruguay	1,237	1,848				1,774	1,728		51,952	720			3,014	899	7,541	68,939
Venezuela	1,684	928	465					910	26,621	2,775	765	244	1,951	4,511	4,623	45,477
TOTALS, SOUTH AMERICA	$21,509	$47,707	$5,907	66	$308	68,466	$55,432	$6,659	$537,984	$36,318	$11,822	$2,916	$301,814	$28,335	$70,435	$1,127,146
OCEANIA:																
Australia		$1,209	$6,371	366	$1,451	12,459	$7,319	$291	$87,323	$3,423	$341	$10,518	$1,266	$982	$8,105	$128,599
New Zealand	$4,365	2,809	1,482	6,120	21,012	1,768	1,779	1,446	200,786	10,577	7,560	1,316	5,743	2,703	9,499	271,077
Other British Oceania		60							1,652	42		230		78	20	2,082
French Oceania	113	1,051	25	2	16			10	968	206	348	1,028	25	15	166	3,971
Other Oceania									1,613		311		25		30	1,979
Philippine Islands	1,238	3,067	1,522	7	25	216	164	1,233	31,609	8,437	3,650	383	6,519	340	13,487	71,674
TOTALS, OCEANIA	$5,716	$8,196	$9,400	6,495	$22,504	14,443	$9,262	$2,980	$323,951	$22,685	$12,210	$13,475	$13,578	$4,118	$31,307	$479,382

EXPORTED TO—	Belting. Value.	Hose. Value.	Packing. Value.	Boots. Pairs.	Boots. Value.	Shoes. Pairs.	Shoes. Value.	Soles and Heels. Value.	Automobile Tires. Casings. Value.	Inner Tubes. Value.	Solid Tires. Value.	All Others. Value.	Insulated Wire and Cables. Value.	Druggists' Rubber Sundries. Value.	All Other Manufactures of Rubber. Value.	Totals. Value.
ASIA:																
Aden	....	....	....	....	....	....	....	....	$2,860	....	....	....	....	....	....	$2,860
China	$147	$1,611	$30	....	....	6,077	$6,939	....	1,232	$24	$5,300	$50	$14,862	$234	$3,542	33,971
Kwangtung	....	....	....	....	....	600	554	....	....	....	....	....	....	....	....	554
Chosen	....	....	....	....	....	....	....	....	302	....	....	....	....	....	15	317
British India	219	4,904	2,371	1	3	1,263	1,402	....	57,038	4,426	4,136	14	14,608	1,254	9,117	99,492
Straits Settlements	....	....	....	....	....	520	591	....	53,966	3,290	1,086	....	....	....	1,825	60,758
Other British East Indies	....	....	....	....	....	264	272	....	287	23	....	....	....	30	197	809
Dutch East Indies	1,973	2,412	....	....	....	....	....	$329	48,646	2,926	5,589	....	728	299	5,148	68,050
French East Indies	....	....	....	....	....	....	....	....	175	32	....	....	....	....	25	232
Hongkong	....	....	311	....	....	120	300	....	4,279	....	....	....	11,393	139	243	16,665
Japan	1,344	3,214	12,594	972	3,395	16,727	18,439	....	41,297	5,514	3,508	13	3,363	759	15,056	108,496
Russia in Asia	8	418	....	24	39	43,657	35,881	....	17,474	....	....	....	....	1,366	....	55,186
Siam	....	....	....	....	....	....	....	....	4,507	....	....	....	....	....	....	4,507
Turkey in Asia	401	789	....	....	....	4,380	3,737	....	2,326	846	....	....	....	....	324	8,423
TOTALS, ASIA	$4,092	$13,348	$15,306	997	$3,437	73,608	$68,115	$329	$234,389	$17,081	$19,619	$77	$44,954	$4,081	$35,492	$460,320
AFRICA:																
Belgian Congo	....	....	....	....	....	....	....	....	....	....	....	....	$89	....	....	$89
British West Africa	....	$1,362	....	1	$5	....	....	....	$93,596	$216	$577	....	35	....	....	95,791
British South Africa	$36,339	9,275	$9,407	122	534	6,235	$5,544	$2,629	81,432	3,465	....	$490	3,702	$2,445	$3,572	158,834
British East Africa	102	....	....	....	....	....	....	....	5,106	....	....	....	55	....	....	5,263
Canary Islands	....	26	....	....	....	....	....	....	3,392	....	....	....	....	....	55	3,473
French Africa	....	....	....	....	....	....	....	....	5,733	57	....	....	....	....	....	5,790
German Africa	....	....	....	....	....	....	....	....	389	....	....	....	....	....	32	421
Liberia	....	....	....	....	....	48	48	....	2,661	....	....	....	....	....	....	2,709
Morocco	....	....	....	....	....	....	....	....	....	....	886	....	....	41	....	927
Portuguese Africa	....	....	471	....	....	....	....	....	....	....	421	....	....	13	198	1,103
Egypt	....	2,097	....	....	....	....	....	400	611	....	....	....	17	350	474	1,852
TOTALS, AFRICA	$36,441	$12,760	$9,178	123	$539	6,283	$5,592	$3,029	$192,920	$3,738	$1,884	$490	$3,898	$2,849	$4,331	$278,349
GRAND TOTALS	$170,299	$272,348	$105,047	39,933	$139,224	1,019,959	$866,483	$64,848	$3,849,706	$214,311	$213,952	$58,067	$567,036	$121,400	$610,247	$7,252,968

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORY OF THE UNITED STATES.

	Belting, Hose, and Packing.	Boots and Shoes. Pairs.	Boots and Shoes. Value.	Tires. Automobile Value.	Tires. All Others. Value.	Insulated Wire and Cables Value.	Druggists' Rubber Sundries. Value.	All Other Manufactures of Rubber. Value.	Totals. Value.
Hawaii	$7,031	....	....	$44,259	$502	....	....	$4,902	....
Porto Rico	9,080	....	....	47,318	7,539	....	....	21,388	....
TOTALS	$16,111	....	....	$91,577	$8,041	....	....	$26,290	$142,019

(Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.)

EXPORTS OF DRUGGISTS' RUBBER SUNDRIES[1] FROM THE UNITED STATES BY COUNTRIES DURING THE MONTH OF JANUARY, 1920.

EXPORTED TO—	Value.
EUROPE:	
Denmark	$2,649
France	1,592
Germany	793
Italy	266
Netherlands	6,130
Norway	338
Portugal	53
Spain	198
Sweden	1,646
England	6,144
TOTALS, EUROPE	$19,809
NORTH AMERICA:	
Bermuda	$29
British Honduras	37
Canada	21,664
Costa Rica	133
Guatemala	3,683
Honduras	59
Nicaragua	258
Panama	1,047
Salvador	93
Mexico	4,729
Barbados	30
Jamaica	142
Trinidad and Tobago	241
Other British West Indies	61
Cuba	8,813
Haiti	59
Dominican Republic	1,889
TOTALS, NORTH AMERICA	$42,967

EXPORTED TO—	Value.
SOUTH AMERICAS	
Argentina	$716
Bolivia	432
Brazil	3,579
Chile	3,104
Colombia	1,384
Ecuador	984
Peru	530
Uruguay	111
Venezuela	886
TOTALS, SOUTH AMERICA	$11,726
OCEANIA:	
Australia	$2,760
New Zealand	1,472
Philippine Islands	894
TOTALS, OCEANIA	$5,126
ASIA:	
China	$1,406
British India	50
Straits Settlements	88
Other British East Indies	12
Dutch East Indies	25
Hongkong	164
Japan	8,262
Siam	166
TOTALS, ASIA	$10,173
AFRICA:	
British South Africa	$212
Egypt	132
TOTALS, AFRICA	$344
TOTAL	$90,145

[1] Details of exports of other domestic merchandise by countries during January were given on pages 470-471, in our issue of April 1, 1920.
(Compiled by the Bureau of Foreign and Domestic Commerce.)

RUBBER STATISTICS FOR THE DOMINION OF CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	January. 1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
UNMANUFACTURED—*free*:				
Rubber, gutta percha, etc:				
From United Kingdom	223	$231	855,876	$478,333
United States	117,266	59,143	859,030	413,566
British East Indies:				
Ceylon	195,190	57,058	......	......
Straits Settlements	852,790	282,934	532,437	275,751
New Zealand	24,400	14,780	......	......
Other countries	11,129	3,895	2,421	997
Totals	1,200,997	$418,041	2,249,764	$1,168,647
Rubber recovered	317,081	52,589	165,197	27,836
Rubber scrap	568,135	63,705	105,582	11,376
Balata	1,051	998	......	......
Totals, unmanufactured	2,087,264	$535,333	2,520,543	$1,207,859
PARTLY MANUFACTURED:				
Hard rubber sheets and rods	1,231	$1,116	6,741	$6,266
Hard rubber tubes	......	1,897	......	3,720
Rubber thread not covered	8,615	12,872	5,683	8,382
Totals, partly manufactured	9,846	$15,885	12,424	$18,368
MANUFACTURED:				
Belting	......	$9,043	......	$12,218
Hose	......	8,355	......	7,963
Packing	......	12,275	......	7,254
Boots and shoes	......	9,680	......	28,765
Clothing, including waterproofed	......	7,646	......	23,570
Gloves	......	......	......	933
Hot water bottles	......	......	......	3,077
Mats and matting	......	213	......	465
Tires, solid	......	16,100	......	29,636
Tires, pneumatic	......		......	61,466
Tires, inner tubes	......		......	889
Other kinds	......		......	......
Rubber cement	......	......	......	5,986
Other manufactures	......	124,378	......	116,740
Totals, manufactured	......	$187,690	......	$298,962
Totals, rubber imports	......	$738,896	......	$1,525,189
Insulated wire and cables:				
Wire and cables, covered with cotton, linen, silk, rubber, etc.	8,479	......	13,857	......
Copper wire and cables, covered as above	*	......	17,643	$33,788
Rubber substitutes	147,924	12,866	183,429	21,755
Chicle	192,324	133,171	31,426	9,222

*Included in "Wire and Cables."

DOMINION OF CANADA RUBBER STATISTICS—(Continued).

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	January			
	1919		1920.	
Unmanufactured	Produce of Canada Value	Reexports of Foreign Goods. Value.	Produce of Canada. Value.	Reexports of Foreign Goods. Value.
Crude and waste rubber..	$20,189		$19,989	$53
Manufactured				
Belting	$829	.	$256	......
Hose	3,440		26,858	....
Boots and shoes	24,522	.	238,708	$272
Clothing, including water proofed	156	$15,035	2,194	......
Tires, pneumatic	.... }		891,728 }	
Tires, other kinds........	175,809 }	427	21,437 }	8,963
Other manufacturers......	2,555	8,218	21,842	4,067
Totals, manufactured..	$207,311	$23,680	$1,203,023	$13,302
Totals, rubber exports.	$227,500	$23,680	$1,223,012	$13,355
Insulated wire and cable	.. ..	. ..	$33,788	......
Cable	...	......	108,527	......

THE MARKET FOR RUBBER SCRAP.

NEW YORK.

The market for rubber scrap has continued in the unsatisfactory state that characterized it for the past few months. It might be described as non-existent.

The New York harbor strike, car shortage and the switchmen's strike brought the rubber scrap business to a full stop about the middle of the month. Buyers are so few and sellers so numerous that prices are seriously cut to make sales. Reclaimers are busy but are not active in the scrap market. Dealers have held their prices on shoes unchanged and no change has been noted in tire scrap. Warehouses are filled to overflowing, awaiting a hoped for demand. Lack of foreign shipments is held largely responsible for present scrap values.

The new Atlantic freight rates for waste rubber are thought by traders to be prejudicial to the trade, one merchant stating that they would kill the business, as it would not pay to collect the material when it was burdened with so heavy a charge for shipment.

QUOTATIONS FOR CARLOAD LOTS DELIVERED.

April 26, 1920.

Prices subject to change without notice.

BOOTS AND SHOES:				
Arctic tops	lb.	$0.01	@	
Boots and shoes	lb.	.07⅝	@	.07⅞
Trimmed arctics	lb.	.05½	@	.05¾
Untrimmed arctics	lb.	.06½	@	.06¾
HARD RUBBER:				
Battery jars, black compound	lb.	.01	@	
No. 1, bright fracture	lb.	.23	@	.24
INNER TUBES:				
No. 1	lb.	.17½	@	.17¾
Compounded	lb.	.09⅞	@	.10
Red	lb.	.08½	@	.08¾
MECHANICALS:				
Black scrap, mixed, No. 1	lb.	.03½	@	.04
No. 2	lb.	.03	@	
Car springs	lb.	.03½	@	.04
Heels	lb	.03	@	.03½
Horse-shoe pads	lb.	.03	@	.03½
Hose, air brake	lb.	.04¼	@	
fire, cotton lined	lb.	.01½	@	.01¾
garden	lb	.01½	@	.01¾
Insulated wire stripping, free from fiber	lb.	.03½	@	.04
Matting	lb.	.01¼	@	.01½
Red packing	lb.	.05½	@	.06
Red scrap, No. 1	lb.	.09	@	.10
No. 2	lb	.06¾	@	.07¼
White scrap No. 2	lb.	.08	@	.09
No. 1	lb.	.10	@	.11
TIRES				
PNEUMATIC—				
Auto peelings	lb.	.04½	@	.05
Bicycle	lb.	.02¾	@	.03
Standard white auto	lb.	.04⅝	@	.04¾
Standard mixed auto	lb.	.03¼	@	
Stripped, unguaranteed	lb.	.02½	@	.02¾
White, G. & G., M. & W., and U. S	lb	.04¾	@	.05
SOLID—				
Carriage	lb.	.04	@	.04¼
Irony	lb.	.01	@	
Truck	lb.	.03½	@	.03¾

THE MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

American Cotton. The market continued quiet and very dull, "no sales" being the record for every day save one. The spot price for middling upland cotton was 41.75 cents on April 1. It rose to 42 and 42.50 cents in the second week, to 43 cents the third week, then dropped for a few days, reading 41.45 cents, and on April 27 was 42 cents again.

Planting is late owing to the wet weather and perhaps in some degree to the request of the Government observers, who hope to avert the ravages of the Egyptian pink boll worm, which has made its appearance in Texas and some parts of Louisiana.

Egyptian Cotton. Some business was done in upper Egyptian cotton in the last half of April, mainly on firm offers made by spinners. The upheaval in the Egyptian market, due to the native growers becoming excited over the high prices paid, has continued and limited the amount of business, making it impossible for exporters to send out firm offers. The demand for spot cotton in Alexandria continues, the selection is growing poorer, and those who have it are advised by brokers to put in their orders without delay. Conservative observers believe that the acreage for the new crop will not be increased materially, owing to government restrictions, as the ground is needed for food crops. There is complaint of a deficient water supply but the new crop, though late, is doing well. One result of excessive prices is to drive customers for tire fabrics toward using short-staple cottons instead.

Arizona Cotton. The last of this year's crop of Arizona Pima has been sold and only two or three hundred bales are now available. The reports are that a much larger acreage has been planted and that the Arizona cotton may be looked upon to supply the deficiency in Sea Island cotton and to avert excessive prices for the Egyptian long staples.

Sea Island. For the time being the boll weevil has killed the American Sea Island cotton and whatever crop is raised will be so small as to be negligible. Increased production in the West India Islands will have little effect on the deficiency, while the promise of relief from new cotton countries, save in the case of Peruvian mitafifi, is purely speculative.

Cotton Fabrics. The demand for all rubber fabrics continues actively and supplies are very scarce. Prices of ducks, drills, sheetings and raincoat fabrics have advanced. There is no change in the market for tire fabrics as conditions are practically the same as last month.

NEW YORK QUOTATIONS.

April 26, 1920.

Prices subject to change without notice.

ASBESTOS CLOTH:				
Brake lining, 2½ lbs. sq. yd., brass or copper insertion	lb.	$1.00	@	1.10
2¾ lbs. sq. yd., brass or copper insertion	lb.	1.10	@	1.15
BURLAPS:				
32—7-ounce	100 yards	9.50	@	
32—8-ounce		9.75	@	
40—7½-ounce		10.50	@	
40—8-ounce		10.65	@	
40—10-ounce		14.25	@	
40—10½-ounce		14.50	@	
45—7½-ounce		12.25	@	
45—8-ounce		12.50	@	
48—10-ounce		17.50	@	
DRILLS:				
38-inch 2.00-yard	yard	.43½	@	
40-inch 2.47-yard		.37⅜	@	
52-inch 1.90-yard		.72⅛	@	
52-inch 1.95-yard		.70¼	@	
60-inch 1.52-yard		.90¼	@	
DUCK:				
CARRIAGE CLOTH:				
38-inch 2.00-yard enameling duck	yard	.46	@	
38-inch 1.74-yard		.52⅞	@	
72-inch 16.66-ounce		1.30¼	@	
72-inch 17.21-ounce		1.34½	@	

MECHANICAL:				
Hose	*pound*	.82	@	
Belting		$0.82	@	
HOLLANDS, 40-INCH:				
Acme	*yard*		@	
Endurance			@	
Penn			@	
OSNABURGS:				
40-inch 2.35-yard	*yard*	*.35	@	
40-inch 2.48-yard		*.33⅞	@	
37½-inch 2.42-yard		*.34	@	
RAINCOAT FABRICS:				
COTTON:				
Bombazine 64 x 60	*yard*	.31	@	
60 x 48		.29	@	
Cashmeres, cotton and wool, 36-inch, tan		1.10	@	
Twills 64 x 72		.47	@	
64 x 102		.49	@	
Twill, mercerized, 36 inch, blue and black		.62	@	
tan and olive		.61	@	
Tweed		.90	@	1.50
printed		.28	@	
Plaids 60 x 48		.30	@	
56 x 44		.29	@	
Repp		.45	@	.50
Prints 60 x 48		.31	@	
64 x 60		.33	@	
IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING—PLAIN AND FANCIES:				
63-inch, 3¼ to 7½ ounces	*yard*	1.45	@	3.90
36-inch, 2¾ to 5 ounces		.85	@	2.25
IMPORTED PLAID LINING (UNION AND COTTON:)				
63-inch, 2 to 4 ounces	*yard*	.95	@	1.90
36-inch, 2 to 4 ounces		.60	@	1.15

DOMESTIC WORSTED FABRICS:				
36-inch, 4½ to 8 ounces	*yard*	[illegible]		
DOMESTIC WOVEN AND PLAID LININGS (COTTON):				
36-inch, 3¼ to 5 ounces		[illegible]	@	.35
SHEETINGS, 40-INCH:				
48 x 48, 2.35-yard	*yard*	[illegible]	@	
48 x 48, 2.50-yard		[illegible]	@	
48 x 48, 2.70-yard		[illegible]	@	
48 x 48, 2.85-yard		.34	@	
64 x 68, 3.15-yard		[illegible]	@	
56 x 60, 3.60-yard		[illegible]	@	
48 x 44, 3.75-yard		[illegible]		
SILKS:				
Canton, 38-inch	*yard*	[illegible]		
Schappe, 36-inch		[illegible]		
STOCKINETTES:				
SINGLE THREAD:				
3½ Peeler, carded	*pound*		@	
4½ Peeler, carded		[illegible]	@	[illegible]
6½ Peeler, combed		[illegible]	@	
DOUBLE THREAD:				
Zero Peeler, carded	*pound*	[illegible]	@	[illegible]
3½ Peeler, carded		1.04	@	1.04½
6½ Peeler, combed		[illegible]	@	[illegible]
TIRE FABRICS:				
BUILDING:				
17¼-ounce Sakellarides, combed	*pound*	[illegible]	@	2.75
17¼-ounce Egyptian, combed		[illegible]	@	2.69
17¼-ounce Egyptian, carded		[illegible]	@	2.50
17¼-ounce Peelers, combed		2.30	@	2.50
17¼-ounce Peelers, carded		[illegible]	@	1.75
CHAFER:				
9¼-ounce Sea Island	*pound*	3.00	@	
9¼-ounce Egyptian, carded		2.50	@	
9¼-ounce Peeler, carded		1.50	@	1.60

*Nominal

EGYPTIAN COTTON CROP MOVEMENT.

From August 1, 1919, to March 10, 1920

	1919-1920.	1918-1919.	1917-1918.
To Liverpool ... *bales*	233,540	175,878	139,826
Manchester	133,075	86,026	91,116
Other United Kingdom ports	145	5,537	62,879
Total shipments to Great Britain	366,760	267,441	293,821
To France	38,856	33,003	10,309
Spain	8,390	10,140	4,684
Italy	20,750	31,380	22,651
Belgium	[illegible]		...
Switzerland	11,261	[illegible]	.350
Holland	666	...	......
Portugal	560	......	......
Germany	2,167	...	.....
Austria	9,529	.....	......
Greece	104	[illegible]	550
Turkey and other countries	98		...
Total shipments to Continent	92,761	[illegible]	41,544
To United States	264,449	33,075	22,543
Japan	15,611	10,534	12,464
Total shipments to all parts	739,521	401,860	370,372
Total crop (interior gross weight), cantars	...	[illegible]	6,315,841

1 cantar equals 98 pounds.
[illegible]

PLANTING NOTES FROM BRITISH INDIES.

The Malay peninsula at present is the regulator of the world's rubber output. About 700,000 acres there are planted with rubber trees and the capital invested is $120,000,000. It is likely that the British settlements, Singapore, Penang, Malacca, Wellesley and the Dindings may amalgamate in a few years with the Federated Malay States, Perak, Selangor, Negri Sembilan, and Pahang, as well as the nominally independent native states, Trengganu, Perlis and Kedah, and ask for a certain measure of autonomy. Rubber culture is making their interests practically identical.

In 1918 the area under rubber in Ceylon was increased and new clearings were made in several districts. The exports of rubber, however, fell to 47,219,128 pounds from the 71,351,629 pounds of 1917. This was due to restrictions on shipping to England and on imports into the United States. Members of the Rubber Growers' Association voluntarily restricted their crop outputs and had asked the Government for compulsory restriction, when the armistice was signed.

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

NEW YORK.

The conditions of active demand and short supply in practically all lines have continued the past month with the situation for the latter half of this time still further complicated as regards deliveries due to the railroad strike, now virtually over.

Aniline Oil. Urgency of demand during the railroad strike raised spot prices to 38-40 cents per pound.

Barytes. Car shortage and cessation of freight haulage caused contracts to be withdrawn and new business refused. It will be sometime before normal conditions will prevail with the producers.

Benzol. The demand has been heavy. Before the strike makers were sold up and the pronounced shortage resulted in sales of 90 per cent at 28-30 cents.

Blacks. The supply of both carbon and lampblack falls short of meeting the consuming demand.

Carbon Bisulphide. The supply is restricted and prices firm.

Carbon Tetrachloride. The price is dependent on that for carbon bisulphide. The unusual demand and short supply resulted in firm prices, which have held steady the entire month.

Dry Colors. Scarcity of basic chemicals has advanced prices of most dry colors.

Litharge. The demand exceeds the supply which has been still further reduced by the railroad strike.

Lithopone. Production is entirely sold up to January 1, 1921. The price is strong at 8 cents.

Sublimed Lead. Demand is in excess of the supply. Prices have advanced to 10-10¼ cents.

Sulphur. Supplies reported ample, demand steady and prices firm.

Whiting. There is promise of an increase of chalk supply soon from England. Until this is effective whiting will be difficult to obtain in large volume.

Zinc Oxide. The growing active demand followed by decreased production under the influence of the railroad strike may possibly lead to an advance in price.

NEW YORK QUOTATIONS.

April 26, 1920.

Prices subject to change without notice.

ACCELERATORS, ORGANIC.

Accelerene, New York	lb.	$4.75 @	
Accelemal	lb.	.55 @	.57½
Aldehyde ammonia crystals	lb.	2.25 @	2.50
Aniline oil	lb.	.38 @	
Excellerex	lb.	.65 @	.75
Hexamethylene tetramine (powdered)	lb.	2.50 @	3.50
N. C. C.	lb.	.50 @	
No. 999	lb.	.22½ @	
Paraphenylenediamine	lb.	2.70 @	3.00
Thiocarbanilide	lb.	.55 @	.70
Velosan	lb.	3.85 @	3.95

ACCELERATORS, INORGANIC.

Lead, dry red (bbls.)	lb.	.12¼ @	
sublimed blue (bbls.)	lb.	.10 @	
sublimed white (bbls.)	lb.	.10 @	
white, basic carbonate (bbls.)	lb.	.10½ @	
Lime, flour	lb.	.02½ @	
Litharge, domestic	lb.	.11½ @	.12¾
sublimed	lb.	.12 @	
imported	lb.	.11½ @	.12½
Magnesium, carbonate, light technical	lb.	.12 @	.14
calcined extra light	lb.	.60 @	
calcined light	lb.	.35 @	
calcined medium light	lb.	.30 @	
calcined heavy	lb.	.08 @	
calcined commercial (magnesite)	lb.	.04 @	0.05

ACIDS.

Acetic, 28 per cent (bbls.)	cwt.	3.62½ @	4.37½
glacial, 99 per cent (carboys)	cwt.	15.50 @	16.20
Cresylic (97% straw color) (drums)	gal.	1.10 @	1.20
(95% dark) (drums)	gal.	1.00 @	
Muriatic, 20 degrees	cwt.	2.25 @	2.50
Nitric, 36 degrees	cwt.	6.00 @	6.50
Sulphuric, 66 degrees	ton	24.00 @	25.00

ALKALIES.

Caustic soda, 76 per cent (bbls.)	lb.	.06¾ @	.07½
Soda ash (bbls.)	lb.	.04 @	

COLORS.

Black:			
Bone, powdered	lb.	$0.06 @	
granulated	lb.	.11 @	
Carbon black (sacks, factory)	lb.	.12 @	.25
Drop	lb.	.05½ @	.15
Ivory black	lb.	.16 @	.30
Lampblack	lb.	.20 @	
Oil soluble aniline	lb.	1.25 @	
Rubber black	lb.	.08½ @	
Blue:			
Cobalt	lb.	.27 @	.35
Prussian	lb.	.95 @	
Ultramarine	lb.	.18 @	.40
Rubber makers' blue	lb.	3.50 @	
Brown:			
Iron oxide	lb.	.04½ @	.06½
Sienna, Italian, raw and burnt	lb.	.05¾ @	.14
Umber, Turkey, raw and burnt	lb.	.05½ @	.09
Vandyke	lb.	.02½ @	.09½
Green:			
Chrome, light	lb.	.42 @	.65
medium	lb.	.40 @	.65
dark	lb.	.60 @	.70
commercial	lb.	.07 @	.15
Oxide of chromium (casks)	lb.	1.25 @	
Rubber makers' green	lb.	3.50 @	
Red:			
Antimony, crimson, sulphuret of (casks)	lb.	.45 @	.50
crimson, "Mephisto" (casks)	lb.	.60 @	
crimson, "R. M. P."	lb.	.65 @	
Antimony, golden sulphuret of (casks)	lb.	.30 @	.35
golden sulphuret (States)	lb.	.30 @	.35
golden, "Mephisto" (casks)	lb.	.33 @	
golden, "R. M. P."	lb.	.33 @	
red sulphuret (States)	lb.	.25 @	.30
vermilion sulphuret	lb.	.55 @	
Arsenic, red sulphide	lb.	.18 @	
Indian	lb.	.14 @	
Red excelsior	lb.	.18 @	.22
Toluidine toner	lb.	4.25 @	
Iron oxide, reduced grades	lb.	.07 @	.14
pure bright	lb.	.16 @	.17
Spanish bright	lb.	.04¾ @	.05½
Venetian	lb.	.02½ @	.06
Oil soluble aniline, red	lb.	2.00 @	
orange	lb.	1.75 @	
Oximony	lb.	.18 @	
Vermilion, American	lb.	.25 @	.30
artificial	lb.	.37 @	
English quicksilver	lb.	1.65 @	1.75
Rubber makers' red	lb.	3.50 @	
purple	lb.	2.50 @	
White:			
Aluminum bronze, C. P.	lb.	.65 @	
superior	lb.	.69 @	
Lithopone, domestic	lb.	.07¾ @	.08¼
Ponolith (carloads, factory)	lb.	@	
Rubber-makers' white	lb.	.11¼ @	
Zinc oxide, Horsehead (carload, factory):			
"XX red"	lb.	.09½ @	.10
"Special"	lb.	@	
French process, red seal	lb.	.11½ @	.11¾
green seal	lb.	@	
white seal	lb.	.13½ @	.13¾
(States)	lb.	@	
Azo (carload, factory):			
ZZZ, lead free	lb.	.09½ @	.09¾
ZZ, under 5% leaded	lb.	.09 @	.09¼
Z, 8-10% leaded	lb.	.08¼ @	.08½
Yellow:			
Cadmium, sulphide, yellow, light, orange	lb.	1.75 @	2.00
red	lb.	1.85 @	
Chrome, light and medium	lb.	.32 @	.35
Ochre, domestic	lb.	.04 @	.07
imported	lb.	.05 @	.08½
Oil, soluble aniline	lb.	2.00 @	
Rubber makers' yellow	lb.	1.50 @	2.50
Zinc chromate	lb.	.45 @	.48

COMPOUNDING INGREDIENTS.

Aluminum flake (f. o. b. works)	ton	28.00 @	
silicate	ton	28.00 @	35.00
Ammonia carbonate, powdered	lb.	.17¾ @	
Asbestine (carloads)	lb.	.02½ @	
Asbestos (bags)	ton	@	
Barium, carbonate, precipitated	ton	90.00 @	
sulphide, precipitated	lb.	.05 @	
dust	ton	100.00 @	
Barytes, pure white (f. o. b. works)	ton	27.70 @	
off color	ton	16.00 @	
uniform floated	ton	27.70 @	
Basofor	lb.	.05½ @	
Blanc fixe	lb.	.05½ @	
Bone ash	lb.	.10 @	
Carrara filler	ton	25.00 @	
Chalk, precipitated, extra light	lb.	.05 @	.05½
heavy	lb.	.04 @	.04½
China clay, Blue Ridge Dixie	ton	20.00 @	
domestic	ton	18.50 @	20.00
imported	lb.	.03 @	.05
Shawnee	ton	20.00 @	

Cotton linters, clean mill run, f. o. b. factory	lb.	[illegible] @ .04
Fossil flour, powdered	lb.	[illegible] @
bolted	lb.	[illegible] @
Diatomite	lb.	[illegible] @ [illegible]
Glue, high grade	lb.	[illegible] @ .40
medium	lb.	.30 @ .35
low grade	lb.	.20 @ .25
Graphite, flake (400-pound bbl.)	lb.	.10 @ .30
amorphous	lb.	.04 @ .08
Ground glass FF. (bbls.)	lb.	.03 @
Infusorial earth (powdered)	lb.	.03 @
bolted	lb.	[illegible] @
Liquid rubber	lb.	[illegible] @
Mica, powdered	lb.	.15 @
Pumice stone, powdered (bbl.)	lb.	.05 @ .08
Rotten stone, powdered	lb.	.02½ @ .04½
Rosin paste	lb.	.17 @ [illegible]
Rub-R-Glu	lb.	@
Silex (silica)	ton	25.00 @40.00
Soapstone, powdered, gray	ton	[illegible] @
Starch, powdered corn (carload, bbls.)	cwt.	5.40 @
(carload, bags)	cwt.	5.12 @
Talc, powdered soapstone	ton	20.00 @25.00
Terra blanche	ton	25.00 @30.00
Tripoli earth, air floated, cream or rose	ton	50.00 @
white	ton	52.50 @
Tyre-lith	ton	90.00 @
Whiting, Alba (carloads)	cwt.	.80 @ .90
Columbia	cwt.	.80 @
commercial	cwt.	1.40 @
English cliffstone	cwt.	[illegible] @
gilders	cwt.	1.45 @ 1.55
Paris, white, American	cwt.	1.75 @
Quaker	ton	16.00 @
Super	ton	30.00 @32.50
Wood pulp, imported	lb.	.03¾ @
XXX	ton	75.00 @
X	ton	65.00 @
Wood flour, American	ton	50.00 @

MINERAL RUBBER.

Elaterite	ton	60.00 @63.00
Gilsonite	lb.	.03¾ @
Genasco (carloads, factory)	ton	62.50 @
(less carloads, factory)	ton	64.50 @
Hard hydrocarbon	ton	35.00 @
K-X	ton	@
K. M. R.	ton	@
M. R. X.	ton	100.00 @
Pioneer, carload, factory	ton	55.00 @
less carload, factory	ton	60.00 @
Raven M. R.	ton	50.00 @70.00
Refined Elaterite	ton	@
Richmond	ton	75.00 @
No. 64	ton	44.00 @
318/320 M. P. hydrocarbon	ton	50.00 @
Robertson, M. R. Special (carloads, factory)	ton	80.00 @
M. R. (carloads, factory)	ton	57.50 @
M. R. (less car loads factory)	ton	60.00 @
Walpole rubber flux (factory)	lb.	.05 @

OILS.

Avoilas compound	lb.	.16 @ .18
Castor, No. 1, U. S. P.	lb.	.21 @
No. 3, U. S. P.	lb.	.20 @
Corn, refined Argo	cwt.	20.06 @
Cotton	lb.	.20 @
Glycerine (98 per cent)	lb.	.23½ @ .24
Linseed, raw (carloads)	gal.	1.79 @ 1.84
Linseed compound	gal.	.85 @
Palm (Lagos)	lb.	.16 @
Peanut	lb.	.25 @
Petrolatum	lb.	.10 @
Petroleum grease	lb.	.07½ @ .09
Pine, steam distilled	gal.	1.65 @ 1.75
Rapeseed, refined	lb.	.22 @
blown	lb.	.22 @
Rosin	gal.	.70 @ 1.05
Soya bean	lb.	.18 @
Tar	gal.	.38 @ .40

RESINS AND PITCHES.

Balsam, fir	gal.	1.75 @ 1.80
Cantella gum	lb.	.55 @
Cumar resin, hard	lb.	.12 @ .16
soft	lb.	.09 @ .13
Tar, retort	bbl.	15.50 @
kiln	bbl.	14.50 @
Pitch, Burgundy	lb.	.10 @
coal tar	lb.	.01 @
pine tar	lb.	.04 @
ponto	lb.	.14 @
Rosin	bbl.	16.95 @21.75
granulated	lb.	None
fused		None
Rosin, K	bbl.	23.00 @
strained	bbl.	18.50 @
Shellac, fine orange	lb.	1.75 @

SOLVENTS.

Acetone (98.99 per cent drums)	lb.	.23 @
methyl (drums)	gal.	1.50 @
Benzol, water white	gal.	.30½ @ .33½
Beta-naphthol	lb.	.90 @
Carbon bisulphide (drums)	lb.	$0.07½ @ .08¼
tetrachloride (drums)	lb.	[illegible] @ .14½
Naphtha, motor gasoline (steel bbls.)	gal.	.28½ @
72 @ 76 degrees (steel bbls.)	gal.	.38½ @
70 @ 72 (steel bbls.)	gal.	.36½ @
68 @ 70 degrees (steel bbls.)	gal.	.35½ @
V. M. & P. (steel bbls.)	gal.	.27½ @
Toluol, pure	gal.	[illegible] @ [illegible]
Turpentine, spirits	gal.	[illegible] @
wood	gal.	1.60 @
Osmaco reducer	gal.	.50 @
Xylol, pure	gal.	.37 @ .45
commercial	gal.	.35 @ .40

SUBSTITUTES.

Black	lb.	.10 @ .21
White	lb.	.11 @ .24
Brown	lb.	.15 @ .24
Brown factice	lb.	.10 @ .22
White factice	lb.	.16 @ .25
Paragol, soft and medium (carloads)	cwt.	18.58 @
hard	cwt.	18.08 @

VULCANIZING INGREDIENTS.

Lead, black hyposulphite (Black Hypo)	lb.	.39 @
Orange mineral, domestic	lb.	.15¼ @
Sulphur chloride (drums)	lb.	.20 @
Sulphur, flour, Brooklyn brand (carloads)	cwt.	3.40 @
Bergenport brand (carloads)	cwt.	3.40 @
superfine (carloads, factory)	cwt.	2.00 @ 2.25
(See also Colors—Antimony.)		

WAXES.

Wax, beeswax, white	lb.	.70 @
ceresin, white	lb.	.18 @
carnauba	lb.	.50 @
ozokerite, black	lb.	.60 @
green	lb.	.60 @
Montan	lb.	.30 @
paraffine, refined 118/120 m. p. (cases)	lb.	.11 @
123/125 m. p. (cases)	lb.	.12 @
128/130 m. p. (cases)	lb.	.13½ @

HEVEA PLANTING IN BELGIAN CONGO.

A systematic effort to establish *Hevea* plantations in the Belgian Congo Colony on a scientific and practical foundation, as has been done in Malaya, is being made at Yangambi, near Stanleyville, on the river Congo. A committee which examined conditions has reported in the *"Bulletin Agricole du Congo Belge."* Planting was begun in 1911, when 11,431 trees were set out on a little over 115 acres of ground; two years later 26,750 more trees were planted on 326 and a fraction acres, making a total of 38,191 trees on 441½ acres of land. The trees are planted nearly 22 feet apart or 82½ to an acre.

All that relates to rubber cultivation was studied: the general conditions of growth, the care of the trees, the manner of tapping, the rubber crop and output, the treatment of the product, the by-crops, such as coffee, the enemies and diseases of *Hevea*, the provision for water and the measures to modulate the rainfall.

It seems that the reputation of Belgian Congo rubber is not very favorable in Europe; there need be less justification for this hereafter. The conditions found in Yangambi, such as good climate, the right kind of soil and suitable facilities for exportation to foreign lands, give promise of as successful results as in Malaya, Java and Sumatra, if the same methods are used as in those countries. Too great profits must not be expected at the beginning and modern methods must be employed.

Belgian Congo has a great advantage over the Far Eastern plantations in that labor is cheaper there than in the Indies, and the experience of the Yangambi plantations has shown, moreover, that the labor is not only useful for rubber culture but skilled in it. Some contract laborers are needed at first to teach the delicate and accurate work requisite in tapping for the latex; but the labor question seems to be one that is easily settled on the Congo, and the future of *Hevea* culture there seems to be by no means unfavorable.

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC GUTTA-PERCHA

Vol. 62 MAY 1, 1920 No. 2

TABLE OF CONTENTS.

Pages

Editorials:
- **The Metric Menace** 479
- **What Machinery Has Done for Rubber** 479-480
- **Looking Ahead in Crude Rubber** 480
- **The Factory Training School** 480
- **Rubber Patent Leather Wanted** 480
- **Minor Editorials** 480

The Metric System Applied to the Rubber Industry. By C. C. Stutz—Chart 481-485

Rubber Balls Brand Walnuts .... Illustrated 485

Rubber Creations for Moving Pictures .... Illustrated 486-487

Stabilizing Southwest Cotton Industry. Portrait of Thomas W. McDevitt 488

Prices of Cotton and Cotton Products .... Charts 489-494

Cotton in British Africa .... Illustrated 494

Chemistry:
- **What the Rubber Chemists Are Doing** 495-496
  Extraction of Rubber Goods. Synthetic Rubber of German Manufacture. Cumar Resin. Variability of Cure of Slab Rubber. Synthetic Acetic Acid as a Latex Coagulant. Lead Oleate.
- **Chemical Patents** 497
- **Laboratory Apparatus** .... Illustrated 497

American Chemical Society—Rubber Division Meeting 498-499

Jar Rings and Poisoned Olives 499

Machines and Appliances .... Illustrated 500-502
Improved Clicking Machines. A New Enclosed Mixing Machine. Automatic Machine for Weighing Rubber Ingredients. Peerless Duplex Hacksaw Blades. Magnetic Chucks. Portable Elevator or Piling Machine. A Disk Type Friction Clutch.

Machinery Patents .... Illustrated 502
Machine for Making Storage Battery Separators. Other Machinery Patents.

Process Patents 502

New Goods and Specialties .... Illustrated 503-504
A British Rubber Hat. Bathing Caps of the Season. A Brush for the Hands and Nails. Pocket Hair Brush and Mirror. The "Erie Cord" Tire. Ludington Armored Pneumatic Tire. Rubber-Soled Bathing Shoe. A New Three-in-One Tire. Gas or Smoke Mask. Expanding and Contracting Stopper. A Silver Anniversary Cord Tire. Novel Sub-Tire. Rubber Suit and Safety Goggles.

The Salvaging of Truck Tires by the Army. Illustrated 505

The Right and Wrong of a Blow-Out Repair. Illustrated 505

The Obituary Record 506
Theodore N. Vail (Portrait). Professor Karl Dieterich, Ph.D.

Interesting Letters from Our Readers 507-508
Rubber and Metallic Substances Applied to Cloth. Special Library Census. On Expansion of Rubber Compounds During Vulcanization. C. W. Sanderson's Reply.

Editor's Book Table 508
"A Table of Tensile Strengths of Rubber." "The Metric Fallacy." "Inorganic Chemical Synonyms and Other Useful Chemical Data." "Industrial Chemistry."

New Trade Publications 508-509

Inquiries and Trade Opportunities 509

Judicial Decisions 509

Diamond Fiber for Rubber Working Equipment. Illustrated 510

United States Rubber Co., Annual Report of 511-512

The Bunsen Burner in Rubber Repair. By Arthur C. Squires—Illustrated 513

Aluminum in the Rubber Industry .... Illustrated 513-514

American Rubber Trade—News Notes and Personals 515-528
- Financial Notes 515
- Dividends 515
- New Incorporations 516
- Joseph E. Mayl .... Portrait and Sketch 516
- Charles Schweinert .... Portrait and Sketch 517
- Intercontinental Rubber Co.—Statement and Balance Sheet of 517
- United States Tire Promotes Sales Executives .. 518
- George R. Loggie .... Portrait and Sketch 519
- C. Kenyon Co.'s Plants .... Illustrated 520
- George W. Sherman .... Portrait and Sketch 520
- L. G. Fairbank .... Portrait and Sketch 524
- Eastern and Southern Notes. By Our Correspondent 521
- New Jersey .... By Our Correspondent 521-522
- Rhode Island .... By Our Correspondent 522-523
- Massachusetts .... By Our Correspondent 523-524
- Akron, Ohio .. By Our Correspondent—Illustrated 524-526
- Mid-Western Notes. By Our Correspondent—Illustrated 526
- Pacific Coast Notes. By Our Correspondent—Illustrated 527-528
- Canadian Notes 528

Mid-West Rubber Manufacturers' Association, April Meeting 526

Billiard Accessories of Rubber .... Illustrated 529

The Rubber Association of America—Activities of ... 530-531

Foreign Rubber News:
- Great Britain .... By Our Correspondent 532-533
- Italy's Rubber Industry. By H. C. McLean—Illustrated 534

Planting:
- Rubber Planting in Kamerun. By Alfred Dominikus—Illustrated 535-536
- African Notes 536
- Singapore Gutta Percha Exports 536

Pneumatic Tread Designs Registered December, 1916, to September, 1917 .... Illustrated 537

Patents Relating to Rubber 538-539
United States. Canada. United Kingdom. New Zealand. Australia. France. Germany.

Trade Marks 539-540
United States. Canada. United Kingdom. Australia. New Zealand.

Designs .... Illustrated 540
United States. Canada.

The Future of the Rubber Market 545-546

Markets:
- Crude Rubber 541
  - Highest and Lowest New York Prices 541
  - Amsterdam Rubber Market 542
  - Antwerp Rubber Market 542
  - Batavia Rubber Market 542
- Reclaimed Rubber 541
- Rubber Scrap 550
- Cotton and Other Fabrics 550-551
- Chemicals and Ingredients 552-553

Statistics:
- Canada, Statistics for January, 1920 549-550
- Ceylon Rubber Imports and Exports 542
- Cotton Statistics 552
- Deli (Sumatra) Rubber Exports 542
- French Indo-China Rubber Exports 542
- Federated Malay States Rubber Exports 542
- Italy, Statistics for October, 1919 547
- Java Rubber Exports 542
- Straits Settlements Rubber Exports 542
- United Kingdom, Statistics for February, 1920 ... 547
- United States:
  - Crude Rubber Arrivals at Atlantic and Pacific Ports as Stated by Ships' Manifests 543-545
  - Imports by Months for 1920 542
  - Plantation Rubber Imports by Ports, 1919 542
  - Exports of India Rubber Manufactures During February, 1920 (By Countries) 548-549

INDIA RUBBER WORLD

CAOUTCHOUC — HEVEA BRASILIENSIS — DICHOPSIS GUTTA — GUTTA-PERCHA

FOUNDED 1889

Reg. U. S. Pat. Off. Reg. United Kingdom

Edited by HENRY C. PEARSON

Vol. LXII. No. 3. JUNE 1, 1920 35 CENTS $3.00 Per Year. $3.50 Abroad.

Entered as second-class matter October 4, 1899, at the post office at New York, N. Y., under the Act of March 3, 1879.
Published monthly at 25 West 45th Street, New York.

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC GUTTA-PERCHA

Reg. United States Pat. Off. Reg. United Kingdom.

Published on the 1st of each month by

THE INDIA RUBBER PUBLISHING CO.
No. 25 West 45th Street, New York.
Telephone—Bryant 2576.
CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, F.R.G.S., Editor

Vol. 62. JUNE 1, 1920 No. 3

SUBSCRIPTION: $3.00 per year, $1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, $3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft. Post Office or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

DISCONTINUANCES: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

TABLE OF CONTENTS ON LAST PAGE OF READING.

A SETBACK TO FILIPINO PROGRESS.

It has been an open secret that for some months past American capitalists have been striving to reach some agreement whereby acreage of jungle land could be secured to plant rubber on a scale comparable with Far Eastern enterprises.

The rubber offer was to plant 100,000 acres in Mindanao, and incidentally to establish a factory in Manila. At the same time another group wished to acquire sufficient wild land to install a vast camphor plantation. These two offers were the result of Filipino propaganda asking for American capital and the assurance from prominent officials that every facility would be afforded to investors.

The stumbling blocks were the existing law that no company can acquire more than 2,500 acres and the law against the importation of Chinese or other plantation laborers. These laws the Filipinos refused to amend. The offers have been therefore withdrawn, and the Philippines lose their chance probably for all time.

One would like to comment severely on the crass folly of such a course. The Filipinos clamor for capital and make investment impossible; they agitate for independence and show absolute incapacity for self-government. They are ready for neither.

GUAYULE IS RUBBER, NOT A "SUBSTITUTE."

One of our esteemed contemporaries, in an otherwise excellent article on "Attempts at Rubber Substitutes" hardly does justice to guayule; indeed, leaves the reader with the impression that it is poor stuff at best. Speaking of Mexican beginnings, he says:

> "This experimentation resulted in a certain measure of success in that a low grade material was manufactured which was a capable substitute for the poorest grades of rubber."

The poorest grade of rubber is perhaps untreated pontianak or jelutong, which at one time was a drug on the market at 4 to 6 cents a pound. Even in its beginnings guayule was worth much more than that. It was, of course, a "capable substitute" for low grade rubber, but so was Pará rubber. It is not, however, low grade. On the contrary, well prepared guayule is classed among the medium rubbers.

Farther on the writer says:

> "One mill was built in Torreon, in the State of Coahuila, where business was carried on successfully for some time. At the period of its greatest prosperity about 600,000 pounds of rubber, or whatever this low grade material might be called, was turned out each month."

The Torreon product was sold as rubber for the very good reason that it was rubber and a very excellent product at that. Certain of the old timers were against it from the first and insisted that it was a substitute and that in spite of the fact that any fair definition of the word "rubber" must perforce include guayule.

At present guayule is quiescent but, our contemporary to the contrary nothwithstanding, it will again be a big factor and that within a decade.

BALATA CULTIVATION.

Rubber cultivation is so big and so successful that it is to-day a commonplace achievement. This in spite of the fact that it was deemed a "pipe dream" by trade leaders during its beginnings. The needs of the world brought it about just as the need for plastics, gutta percha, balata and chicle will in turn bring about plantations that produce these gums.

Of course the problem is a more difficult one. The *Sapotaceae* are slow-growing trees and the product is not large. Nor do any of them show the "wound response" that proved such a boon for the *Hevea* planter. Nevertheless, one should not forget the large gutta percha plantations in Java instituted by the farsighted Dutch.

It is also gratifying to note that balata is being grown in the Dutch East Indies in a small way, to be sure, but it is a beginning. The British Government

is also doing its bit in using the "bully tree" in reforesting in the West Indies and in its African possessions.

The *Mimusops balata*, while it does not produce a gutta equal to that from the *Palaquium*, has an advantage in that the wood is of great value for building purposes.

Now if chicle could have its turn and become a plantation product the *Sapotads* would be receiving at least a fair chance.

AIR FORDS NOT AS YET.

THE CREATION by one of the big rubber companies of a pony blimp or "flyabout" has been hailed by some of the semi-wise as the beginning of an era when air travel will challenge earth travel. They assume to see a development akin to that of the Ford car in the motor world. It would of course be wonderful were it within the realm of reality but alas it is not, nor will it be in this generation. England experienced the same visions and dismissed them.

A recent report on this subject from abroad places the minimum price of the small blimp at fifty thousand dollars. As against the five hundred charged for the first Fords the difference is appalling. Indeed, in spite of the wealth the laborers are piling up day by day, and their courage in spending, few will feel able to purchase "flyabouts."

ACCIDENTS IN FACTORIES.

THE URGENT NEED of a more aggressive "Safety First" campaign by American industrial leaders was strikingly emphasized in reports submitted at the first annual Massachusetts Accident Prevention Congress. One of the speakers, C. W. Price, general manager of the National Safety Council, Chicago, and who was connected with the National Harvester Co., said that of the 2,000,000 American boys who in nineteen months went overseas in the Great War 47,949 were killed or died from wounds received in battle. Yet, he said, in the same period "126,000 men, women, and children were killed, 35,000 in industry, and 91,000 outside industry, 25,000 of the latter being children. In other words, during those nineteen months our boys were fighting on the other side of the water, there were 220 people killed in this country every twenty-four hours; and it would take a ditch forty-eight miles long and as wide as the ordinary sidewalk to hold the bodies of those 126,000 men, women, and children."

Such sacrifice of human life in the pursuits of peace, and depletion of labor that was never more urgently needed, were to a great extent avoidable, said Mr. Price, who quoted figures to prove that of 22,000 serious accidents reported by industry in 1919, fully 16,500 were preventable. He said that in 1,000 industries reporting, reductions of from 50 to 75 per cent in deaths had been effected by joint cooperation of employers and employes, about one-third of the good work being accomplished by means of mechanical devices and the remainder by enlisting the active aid of shop foremen.

That effective safety work not only spared manufacturers large losses in death and accident claims, but actually helped in dividends was another contention of the speaker. Enlightened employers have found that the safety movement wins workers and gives a dignified standing to business life, as well as being a sound, profitable business proposition. While he was pleased to note much progress, the speaker lamented the fact that a recent survey showed that scarcely one concern in ten develops a proper cooperative spirit among its employes, whereby they can feel that their employers take a real, personal interest in their welfare and will second every effort they make to safeguard human life and limb.

STANDARDIZATION AND GOLF BALLS.

A LEATHER BALL stuffed with feathers, at one time led all others in the game of golf. Had this ball been standardized, in other words, if no golf matches could be played except with the feather-filled ball, it would doubtless still be used. And—the solid gutta and the Haskell would never have been known.

The corollary is that to standardize the present rubber-cored ball is to kill its successor, a lively durable ball that will sell at 20 cents instead of a dollar.

THAT THE UNITED STATES IS NOW AT THE PEAK OF ITS crude oil production is an accepted fact. Despite the energetic efforts being made to augment production and to discover new sources, the result does not warrant the belief that it can long offset the constant growth in demand for oil and its products. This means that solvent naphtha, of which the rubber industry is a large consumer, will be produced in steadily diminishing quantities unless some new source of supply is discovered.

STAID BRITISHERS MAY NOT MUCH LONGER REFER reproachfully to the "gum-chewing Yankees," for, judging by the trade statistics, their own fellow-countrymen are fast becoming Americanized in at least this one respect. Chicle, once used in England as an adulterant of gutta percha, is now consumed there to almost as large an extent in the form of chewing gum. The change has come about almost wholly through the Great War. Munition factory workers especially cultivated a taste for the American product, and its popularity spread rapidly among the soldiers, giving comfort to the men on long marches or in the front trenches in France and Flanders where smoking was forbidden. During the last year of the war, 1918, England bought $1,119,898 of the total of $1,695,903 exported by the United States. The amount fell to $771,144 in 1919, but 1920 is expected to show a large increase in sales of American chewing gum in the United Kingdom.

TYPE OF PUBLIC LAND STILL AVAILABLE FOR LEASE OR PURCHASE ON BASILAN ISLAND, ZAMBOANGA PROVINCE. PROVED RUBBER COUNTRY. ABOUT 90 PER CENT UNDER COGAN GRASS.

Rubber (Hevea Brasiliensis) as a Philippine Agricultural Investment.

By H. F. Cameron, Lieutenant Colonel, Engineers, U. S. A.

GENERAL OUTLINE.

THE PROPOSITION outlined hereafter pertains to the production of plantation rubber (*Hevea brasiliensis*) as an agricultural venture for the southern part of the Philippine Islands.

LAWS.

The land laws (Organic Act of 1902) permit an individual or a corporation to secure a fifty-year lease (25 years original and 25 years renewal) of twenty-five hundred (2,500) acres of public land, while a corporation (three or more persons) may purchase at an appraised value, generally of $2 an acre, after advertising and bidding. The annual lease rental approximates $0.10 an acre for the first ten years, with increase upon new appraisements made periodically.

These laws forbid the import of contract unskilled labor. The Insular Government does, however, contract with Americans for duty in the Philippines and has brought in Javanese skilled laborers for instruction or educational purposes. The irrigation and water power laws are liberal and sufficient for economical agricultural or industrial operation.

LOCATION.

The Provinces of Zamboanga, Cotabato and Davao (and small sections adjacent thereto), Department of Mindanao and Sulu, Philippine Islands, have been selected, after a thorough personal investigation of the entire Archipelago, as best adapted in land, labor and other economic factors to produce the highest returns for money invested in plantation rubber. This territory is included within North Latitude 5° to 8°, and West Longitude 121° to 127°.

CONDITIONS.

The soil in these sections is alluvial and mostly of volcanic origin; very rich in humus; in the open areas free from fungus growths and beetle breeding, decaying stumps or roots; and capable of constant refertilization from the adjacent mountain washes or the silty rivers available for irrigation and power purposes.

Of the available areas, some are already under cultivation by corporations or individuals who have acquired titles under the laws of the Philippines, while other areas may be leased or purchased as desired.

The climatic conditions of this section are peculiarly favorable to obtaining rubber production. The temperature ranges from 75 to 92 degrees; the relative humidity 70 to 85 degrees; the annual rainfall is well distributed and averages from 70 inches on Basilan Island, Zamboanga Province, on the west, to 140 inches at the foothills on either side of the low watershed extending south from Mount Apo to Matutun in Cotabato and Davao Provinces; on the west slope of the watershed (Kidapaun and Kabakan) rainfall in the morning is unusual; the entire area is out of the typhoon belt, while the droughts, common to all tropical countries, are no worse here than in other tropical possessions.

LABOR.

The last census for the Philippine Islands shows a population of 10,320,000. The center of population appears to be in the north Visayan Islands, Cebu Island having the largest population per square mile, approximately 350. Mandanao, on the contrary, the only possible plantation rubber producing land of the Philippine Islands, or even under the shadow of the American flag, has the smallest population per square mile, approximately 18.

The unskilled labor wage in the Philippine Islands varies with the locality and in accordance with the economic law of supply and demand—from $0.30 a day to $0.60, the latter price in the agricultural sections of Mindanao.

GOVERNMENT.

The Organic Act of 1902, which included land, mineral and labor laws that are still in force, did not provide for the economic developments that were beyond the poor man to handle and yet not sufficient for the industrial user to become interested. Rubber is a commodity in point. The poor man can get a quick financial return for his investment in corn, rice, sugar and cotton; it is a matter of six to nine months. He may develop cocoanuts successfully through the five or seven years to production by the use of catch crops, but in rubber, which requires approximately $200 an acre to bring to production, and a few other commodities the poor man has no catch crop opportunity and six or seven years is a long period to carry the financing when one has no other source of income than the agricultural returns from this land.

GOVERNMENT ATTITUDE TOWARDS CAPITAL.

The Philippine government officials realize that they themselves have not the capital to quickly develop the islands in agriculture, industry and commerce. That they do desire this development in accordance with existing laws is evident from the large government loans made (aggregating millions of pesos) to going concerns that were in financial difficulty. They prefer, however, industries that can operate under the present laws and where the Filipino can own the land. The sugar central idea is an extremely popular example of this development. For rubber and similar commodities, however, their laws were so framed by

early American administration that operation is possible only on a small scale—too small for either success or to interest capital.

Although the progressive Filipino realizes the economic features involved, his constructive efforts to remedy a situation to which he was never a party, have so far been unsuccessful. He still persists, however, and it is believed that his efforts will shortly be crowned with success.

RUBBER FACTS.

The main essentials for a successful rubber plantation are:

(a) A cheap, abundant and dependable labor supply.
(b) Large areas of well-drained soil in a proved rubber country.
(c) Care in seed selection and the tree elimination with age.
(d) An annual, well-distributed rainfall of over 60 inches with freedom from morning rains.
(e) A temperature above 70 degrees F. and a relatively high humidity.
(f) Freedom from winds.
(g) Tree protection against deer, wild boar and other bark attacks.
(h) Good land and sea transportation for export and import.
(i) Favorable land leases or titles, taxes, and governmental attitude.
(j) Efficient management.

The answer to these essential needs is:

That the labor is not at present adequate for a large acreage development in either supply or wage. For a large acreage—40,000 hectares—the immediate call for the hard work would be for 10,000 to 20,000 laborers. To secure this number in the Philippines quickly, if it were possible, would result in curtailment of production in other necessary lines, accompanied by a raise in wages that would make competition with Dutch Far East colonies still more unfavorable. The present increase in Philippine population does not keep pace with their development, and, until the laws are amended to permit entry of abundant cheap labor, and this condition is remedied, a rubber plantation under present Far Eastern competitive conditions will not be successful.

THREE YEAR OLD RUBBER, BASILAN, SHOWING PATANI BEAN COVER.

Relative to large areas needed it is only necessary to state that the use of rubber is in its infancy. The United States uses about 75 per cent of the world's rubber, almost all of which comes through New York and London markets. The maximum producing age of a plantation is reached somewhere between its tenth and fifteenth year—the original 100 or 120 trees an acre originally planted being reduced by elimination as the trees and root systems expand. Although the individual tree under proper treatment produces more latex with each year of age, this increase per acre after the tenth year remains almost constant, due to trees eliminated. The 1920 requirements for one large rubber factory are 120,000,000 pounds of rubber, which is the maximum output of approximately 100,000 hectares of land. Therefore, one sees the uselessness of talking in 2,500-acre (present maximum acreage possible to obtain under law) developments, which, under the maximum possible production would give operation to this factory less than four days a year.

In Java, in instances where rubber trees have been watched, recorded and rated like pedigreed cows for quantity and quality of latex produced, the result of seed selection and budding of tested poor producing young trees with cuttings from high producing trees, the result on an acre of trees over ten years of age is 500 pounds of rubber per acre per year. This, therefore, should be an important consideration in a new development.

The rainfall, temperature, humidity and freedom from wind conditions pertaining to the southern Philippines is more favorable in certain sections than others.

The protection of trees against destruction by animals, fire, or other causes during development is easily furnished by fencing and proper maintenance.

The transportation facilities on land and sea are construction features only. Local conditions are extremely favorable in this respect.

The land leases and titles for areas over 1,000 hectares (2,500 acres) cannot be obtained except by purchase of old church or Spanish concessions, none of which are in this section.

The taxes are very favorable while the government's attitude has always been kindly and helpful. There is no reason to believe that it will ever be otherwise.

Efficient management is very important here as elsewhere in the tropics. The selection of representatives who know local conditions as to laws, officials, labor and customs is essential.

ESTIMATE TO DEVELOP 1,000 HECTARES (2,500 ACRES).

In this estimate of cost to develop a 1000-hectare (2500 acres) rubber (*Hevea brasiliensis*) plantation in the Philippines the experience of the Dutch Netherlands and English colonies in the Far East as well as that of going concerns in the Philippines has been considered. It is recommended from possible fungus considerations, as well as initial development cost, that heavy jungle areas be avoided and that cogan (a tall fibrous grass) land be selected and that, to keep down weeds, to make for the most economical maintenance, Patani bean (an evergreen with fertilizing and fire resisting qualities which is disliked by wild animals) be planted.

To make this estimate on a business basis it will be assumed that the rubber selling value will be $0.40 a pound (present price is over $0.60 a pound); that the plantation will be fully cleared and planted in two years and that a less than maximum acre year production will result. The following estimates are the result of careful consideration based on practical knowledge.

FIRST YEAR.

		Debit	Credit.
Land purchase 2,500 acres @ $2. 1st payment 25%		$1,250	
Clearing, plowing, planting 1,000 acres land, which is 90% cogan @ $25		25,000	
Fencing 1,000 acres @ $3		3,000	
Tools, cattle, etc., using native methods		10,000	
Superintendence and administration:			
General superintendent	$8,000		
Four white foremen @ $1,800	7,200		
Cashier and bookkeeper	2,400		
Office assistants (native), stationery, furniture, etc.	5,000		
		22,600	
Miscellaneous, such as surveys, roads, wharves, launch, water supply, drainage, doctor, medicine, etc		20,000	
Superintendent's bungalow and furniture		2,000	
White men's quarters		1,500	
Laborers' quarters first year		1,500	
Office and store—two-story		2,000	
Store with stock		3,000	
Tools and cattle sheds		1,500	
Hospital and equipment		5,000	
Interest on $100,000 @ 6%		6,000	
Total expenditures		$104,350	
Profits from store first year			$10,000
		10,000	
Cost of first year's development		$94,350	

SECOND YEAR.

	Debit	Credit
Second payment on land purchase	$1,250	
Clearing, plowing, planting 1,500 acres @ $25	37,500	
Fencing 1,500 acres @$3	4,500	
Maintenance of 1,000 acres, second year @ $4	4,000	
Tools, cattle, etc., using native methods	10,000	
Superintendents and administration	25,000	
Miscellaneous	15,000	
Interest at 6% on $200,000	12,000	
Total expenditure	$109,250	
Store profit for second year		15,000
	15,000	
Cost of second year's development	$97,250	

THIRD YEAR.

	Debit	Credit
Third payment on land purchase	$1,250	
Tools, cattle, etc	5,000	
Maintenance of 2,500 acres @ $4	10,000	
Superintendence and administration	25,000	
Miscellaneous	10,000	
Interest on $250,000 @ 6%	15,000	
Total expenditure	$66,250	
Store profits for third year		15,000
	15,000	
Cost of third year's development	$51,250	

FOURTH YEAR.

		Debit	Credit
Last payment on land purchase		$1,250	
Tools, cattle, etc		5,000	
Maintenance of 2,500 acres @ $4		10,000	
Superintendence and administration		25,000	
One-third cost of crêpe plant to be designed for full development but installed as needed:			
2 Universal washers	$6,000		
30 macerating, crêping and finishing mills	25,000		
400-h.-p. steam plant	9,000		
	$40,000	14,000	
Note.—If hydroelectric probably $10,000 higher first cost against cheaper maintenance and operation later.			
Miscellaneous		10,000	
Interest on $300,000 @ 6%		18,000	
Total expenditure		$93,250	
Store profit for fourth year			15,000
		15,000	
Cost of fourth year's development		$78,250	

FOURTH YEAR.

		Debit	Credit
Tools and cattle, including tapping implements, etc		$10,000	
Maintenance of 2,500 acres @ $3		7,500	
Plant operation and tapping 100,000 trees		30,000	
Superintendence and administration		25,000	
Half cost on:			
2 buildings, 120' x 5' two-story with drying system with cement floors	$10,000		
2 buildings, 120' x 50' for smoke	5,000		
1 building, 150' x75' one story, cement floor for crêpe plant	5,000		
1 building, 150' x 75' with cement floor for coagulation plant	5,000		
1 building, 120' x 60' single story, cement floor for grading and packing	4,000		
1 building, 100' x 50' single story, cement floor for box factory and repair	4,000		
	$33,000		
One-half cost applied this year		16,500	
Second payment crêpe plant machinery (⅓ cost)		13,000	
Miscellaneous		10,000	
Interest on $400,000 @ 6%		24,000	
Total expenditure		$136,000	
Rubber returns 100,000 × ¾-lb. @ $0.40			30,000
Profit on store for fifth year			15,000
		45,000	
Cost of fifth year's development		$91,000	

SIXTH YEAR.

	Debit	Credit
Tools, cattle, including tapping equipment	$10,000	
Maintenance of plantation	7,500	
Plant operation and tapping 250,000 trees	70,000	
Superintendence and administration	25,000	
Final cost of crêpe machinery (⅓ cost)	13,000	
Final cost of buildings (½ cost)	15,500	
Miscellaneous	10,000	
Interest on $500,000 @ 6%	30,000	
Total expenditure	$182,000	
Return from 250,000 trees: 100,000 × 1¼ = 125,000 lbs. 150,000 × ¾ = 112,500 lbs.		
237,500 lbs. @ $0.40		95,000
Profit on store		15,000
	110,000	$110,000
Cost for sixth year	$72,000	

SEVENTH YEAR.

	Debit	Credit
Tools, cattle, etc	$10,000	
Maintenance of land and building (5% of cost) which is $90,000	4,500	
Tapping	50,000	
Plant operation, boxing and shipping 387,500 lbs	30,000	
Superintendence and administration	25,000	
Miscellaneous	10,000	
Interest on $500,000 @ 6%	30,000	
Total expenditure	$159,500	
Returns from 250,000 trees: 100,000 × 2 = 200,000 lbs. 150,000 × 1¼ = 187,000 lbs.		
387,500 lbs. @ $0.40		$155,000
Profit from store		15,000
Total receipts		$170,000
Deduct expenditure		159,500
Credit balance (represents 2% on $500,000 capitalization)		$10,500

EIGHTH YEAR.

	Debit	Credit
Cost of up-keep and operation	$160,000	
Return from 250,000 trees: 100,000 × 3 = 300,000 lbs. 150,000 × 2 = 300,000 lbs.		
600,000 lbs. @ $0.40		$240,000
Profit from store		15,000
Total revenue		$255,000
Deduct expenditures		160,000
Credit balance (represents 20% on $500,000 capitalization)		$95,000

NINTH YEAR.

	Debit	Credit
Cost of up-keep and operations	$175,000	
Returns from 250,000 trees: 100,000 × 3½ = 350,000 lbs. 150,000 × 3 = 450,000 lbs.		
800,000 lbs. @ $0.40		$320,000
Profit from store		15,000
Total revenues		$335,000
Deduct expenditures		175,000
Credit balance (represent 30% on $500,000 capitalization)		$160,000

TENTH YEAR.

	Debit	Credit
Cost of up-keep and operation	$200,000	
Returns from 250,000 trees: 100,000 × 4½ = 450,000 lbs. 150,000 × 3½ = 525,000 lbs.		
975,000 lbs. @ $0.40		$390,000
Profit from store		15,000
Total revenues		$405,000
Deduct expenditures		200,000
Credit balance (represent 40% on $500,000 capitalization)		$205,000

CONCLUDING REMARKS.

The total estimated cost to develop a 1,000 hectares (2,500 acres) rubber plantation in the Philippines is $500,000 or $200 an acre. Such a plantation properly developed should average 500 tons to 635 tons (400 to 500 pounds an acre year) of crêpe rubber a year henceforth at a cost of from $0.20 to $0.30 a pound. This cost will make for a good profit until the peak is reached when the demand is exceeded by the production. It is then that the low production cost, wherever it may occur—it points to

Java and Sumatra now will prevail unless Philippine production is protected by United States import taxes on foreign raw or finished raw commodities.

The end of 1918 showed over 400,000 commodities of rubber in different conditions, while the end of 1919 showed an increase to 500,000 commodities with new uses developing daily, as the rise in price of wood, iron and steel permit the rubber substitute at a lesser cost.

Because of the tremendous initial and carrying cost of development, rubber is primarily a development for a large industrial consumer. The small planter will never be a source of supply for this commodity like the cotton raiser, nor can it be produced on the popular sugar central basis.

The Philippine Government has under serious consideration the necessary law changes to permit large responsible industrials to operate. Understanding the present situation as outlined above, it is believed that capital with faith and courage in the Philippine Government may take the maximum land area allowed by present laws and develop, using Filipino labor, with an assurance that amended laws will soon permit this operation to expand on as favorable a business basis as now pertains to the rubber producing Dutch Netherlands and British Colonies of the Far East.


Tappers—Front Row, Yakans, Rear, Filipinos.

A Layout of a Scientific Rubber Footwear Factory.

A comparison of the plant lay-outs of the leading rubber footwear factories in this country reveals differences in plant arrangement which are easily explained. Many of these factories have been in operation for forty years or more, and frequent additions to meet the demands of increased production have assumed such proportions that the original lay-outs have been lost sight of entirely. There are cases, too, of exactly the reverse nature where in the centralization of certain classes of the product in separate plants, some factories for the time being find themselves utilizing more production space than efficient management would require.

SEQUENTIAL AND PARALLEL PROCESSES.

Rubber footwear manufacturing involves both sequential and parallel processes by which the raw material undergoes chemical and physical changes before it finally reaches the finished state. A light rubber, for example, has the following parts: upper, outsole, toe cap, heel foxing—known as the "gum work"; insole, lining, junior, cloth heel, joining strip, rough back, filler—grouped together, known as "inside work." The "gum work" and the "inside work" are prepared for making in parallel processes which are in themselves sequential. Thus the linings have to be coated, laid in tables of forty ply for cutting; cut, counted, cemented and joined before they reach the makers' table. Similarly the outsoles have to be calendered and cut before they are ready for making. It is necessary that all parts be prepared and ready for making before the shoe is assembled or made. After the assembly, the process becomes purely sequential, varnishing, curing, stripping, trimming, and packing being the final operations.

The use of conveyors, which have speeded up production in tire manufacturing, is not suited to the production of footwear on account of the number and tackiness of the small parts used. Thus we find the hand truck still largely used in footwear factories.

INTERDEPARTMENTAL BALANCE.

Balance between the departments is most important, and the first step toward balance is an adequate lay-out. The chain of operations is only as strong as the weakest unit. The arrow which points to the direction of the productive flow, then, must keep as nearly as possible to a continuous course. Operations must be grouped in departments according to their order, and the routing facilities must be adequate to keep the unfinished material in its continued progress through the plant.

Manufacturing can be classified, generally speaking, as either manufacturing to order or manufacturing to stock. Rubber shoes come under the latter class; that is, they are manufactured according to a stock design on orders or anticipated orders. This insures standard, permanent equipment and operations which are practically unaffected by changes in styles from year to year. Lasts change, but most factories have shops where they fashion their own, either of metal or wood. Metal lasts of aluminum have the advantage that they can be melted up and recast. Similarly, new styles call for changes in patterns and dies, but this is taken care of by the pattern department, a necessity in every shoe factory.

THE IDEAL BUILDING.

Owing to the large number and the comparatively skilled class of workers required for the industry, most of the plants are located in cities where land is at a premium. For this reason floor-space has increased in value and the tendency is toward high buildings. This simplifies the problem of expansion, however, as the addition of a night shift in the mill room can double the stock output, while the addition of another story to the making room will take care of the increased production.

The U-type of building, four stories high, has been chosen as best suited for manufacturing rubber footwear. The railroad siding runs parallel to the U, permitting the entrance of the raw materials at one end and the exit of the finished product at the other. The raw materials used are crude and reclaimed rubber, compounding ingredients, and cotton fabric.

STORAGE OF RAW MATERIALS.

Rubber should be stored in a cool, dry place such as is provided in the basement under the stores department A. Cotton cloth can be stored in room A, while compounding ingredients such as whiting, litharge, lithopone and sulphur are kept on the second floor H, adjacent to the compound room I, where they are kept in drying bins ready for use. Storage spaces M and R on the third and fourth floors are for a reserve supply of materials necessary in these times of uncertain markets and transportation.

POWER, HEAT AND LIGHT.

These are the next factors to be considered. A great many rubber shoe factories buy all their power, and unless the circumstances are exceptional it is generally cheaper to do so. It is assumed, therefore, that the electric power necessary to run the motors in the mill, calender, and cutting rooms is received from an outside source and reduced to the required voltage through transformers. Enough power to run the lighting plant can be made on the premises. Heating is by direct steam from the boilers located in room D, which also supply heat for the vulcanizers, mills, calenders, and heel presses. Machine shop E is placed between the arms of the U next to the boiler rooms and adjoining the mixing and calender rooms where the bulk of the heavy machinery is located.

COMPOUNDING.

We will now follow the productive arrow through the operations. First of all is the mixing of the compounds, which is done in a separate compartment B, next to the mill and calender room.

Despite the fact that compounds are no longer secrets in the fullest sense of the word, rubber manufacturers still closely guard their formulas. In one factory, known to the writer, the stocks are mixed in a separate building some distance from the mill room. In another, the mixing is done in the calender room with no pretext of secrecy. The sequence of operations calls for it being located next to the calender room, as is shown in the diagram. It is equipped with four 20 by 22 by 60-inch mixers, one washer, two 15-inch crackers, and two 40-inch refiners. The ingredients are weighed in the compound room T on the second floor and lowered to the mixers on a small lift or dummy elevator. The rubber is weighed out near the mills. Most manufacturers break down the rubber before mixing, and one of the mills can be reserved for this purpose entirely.

The mixing of rag stock made of fabric scrap, reclaimed rubber, and cheap fillers which is used exclusively in footwear for coating insoles and inside pieces where a stiff compound is required, forms an important part of the work of this department. There is considerable truth in the statement that the cheaper the stock the harder it is to manipulate successfully. In the plan here shown the scrap from the cutting room is fed into a bin by means of a chute from the second floor. Bins are also provided for gum scrap which is worked back in the freshly mixed batches in fixed percentages to insure uniform stock.

CEMENT, VARNISH AND SCRAP DEPARTMENTS.

The making of cement and varnish is done in two separate buildings apart from the main factory on account of the highly inflammable materials used. A scrap department is also located in an outside building.

CALENDER ROOM.

In the calender room the work divides itself into three or four classes which call for grouping of machinery along these lines. The rolls of cloth are brought from the store room A to the cloth dryer in room C, where the moisture is removed before calendering. Three 4-roll calenders are provided for coating and frictioning cloth. This type is now generally used, the fourth roll insuring a more uniform gage in running the stocks. Each calender is provided with two mills for "warming up."

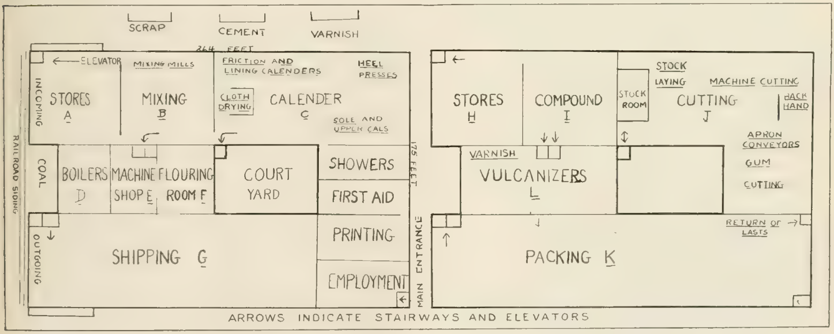
The heel department is equipped with a calender for laminating the stock, a beam cutting press for dieing out the blanks, three two-platen heel presses, one single platen press for molding fibre soles, and two heel trimming machines for removing the overflow. This semi-cured stock is returned to the mixing room, run through a refiner, and used again in fresh stock. The upper and outsole calenders complete the units in the department. For running uppers, two of the calenders are used for print uppers for gum shoes and a third for running plain sheet for boots and heavy all-rubber gaiters. Two outsole calenders complete the outfit.

MISCELLANEOUS PROVISIONS.

It will be noticed that all stock from these calenders is carried directly to the cutting room on conveyor belts. This prevents the soft upper stocks from being exposed to the necessarily dusty atmosphere of the calender room. The coated and frictioned stocks are carried to the cutting room on an elevator which is used exclusively for keeping material moving between departments. Lastly, but not the least important, we have the foreman's office centrally located, that each section of his department may be under his eye at all times. A wash room with shower baths for the use of the mixers is a necessity in all rubber factories where accelerators of a poisonous nature are used. The first aid room is located on the first floor with a separate entrance and easily accessible to all departments.

CUTTING ROOM.

The cutting room J is the next department in the sequence and is located on the second floor directly over the calender



First Floor. Second Floor.

Lay-out of an Ideal Footwear Factory.

room. Rolls of friction, net linings, rag fillers, and tennis duck are brought from the first floor on the elevator and placed in the stock room, which is equipped with bins open at both ends. This enables the fresh stock to be placed at one end, and the oldest can be easily removed from the other. The best results are obtained when the stock is aged at least a week, and this requires ample storage facilities.

Six tables are reserved for laying off stock for cutting, and a revolving drum for plying up nets, frictions, tennis, and fleeces is also employed. Rag and insoling and the heavier stocks which need to be coated with whiting between the plys to prevent their sticking together, are doubled off by hand. Twelve cutting machines, six of the double clicker type, and six beam presses are stationed next to the stock laying tables. An overhead motor with belt drive furnishes the power. An overhead track arrangement with a siding for each table can be used effectively for carrying the stock from the drum and tables to the machines.

The clicker machines are used on light work, such as insoles, tennis, fillers, and linings, and the beam presses for the heavier stocks. Large patterns, such as boot leg linings, and smaller ones where the demand does not justify the purchase of dies, are cut by back hand cutters for whom five tables are provided adjacent to the machines. The cut stock is laid out on the tables at the head of the machines where it can be easily checked by inspectors, placed on trucks, and carried to the preparatory department on the next floor.

The scrap cage is placed near the drum so that the weights of the tables of stock can be obtained as they are laid off. The scrap from the cutters is checked and weighed here before being taken to the compound room and deposited in the chute. In the center of the room the successive operations of cutting and assembling vamps, counters, and legs for boot teams are carried on. In the gum cutting section, the sole cutting is done by machine and hand, print upper cutting on the zinc plates, and die cutting on the wooden block. The space in the center of the room is reserved for stock. A bias machine cutter located next to the back-hand cutters cuts all the strips for binding the edges of shoes.

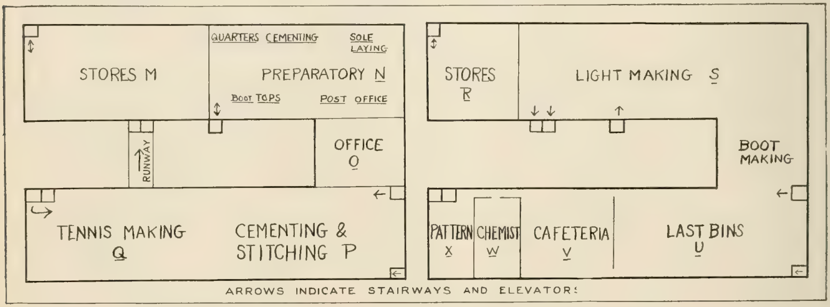
In the gum cutting section the sole and upper stocks are taken off the aprons on books, frames, reels, and shells with a liner between the stock.

PREPARATORY DEPARTMENT.

The next step in the progress of production takes place on the third floor where the preparatory department N is located directly over the cutting room. The grouping of operations here may seem to be a departure from the lay-outs of many footwear plants. But analysis of the processes will show that they are all related and can be well controlled and supervised under one separate department.

The post-office section or stock cage is where all the inside work for gum shoes, tennis, gaiters, and boots is counted into sets for the different makers. These pieces are then prepared and cemented for the makers, some by hand, and others, such as insoles, cemented on one side, and juniors, and fillers cemented on both sides, by machines which convey the pieces to belts for drying. The insoles are carried the length of the room on an overhead belt to the making room above, where they are picked off by boys and made up into sets. Other preparatory operations in this department are top making for storm king and hip boots, quarter making, and sole laying where the outsoles for boots, heel tennis and lumberman's are made up with the heel and form sole.

The preparatory department is a very important connecting link between the cutter and maker, and to be operated efficiently it must have space enough to take care of all operations. If it is cramped for space, or, as in one footwear plant, its subdivisions are tucked away in odd corners of the shop, production cannot fail to be seriously hampered. Some means of ventilation must be provided here, too, for the obnoxious odors of stale naphtha make it difficult to obtain good help unless the air is kept fresh.



Third Floor. Fourth Floor.

Lay-out of an Ideal Footwear Factory.

EXECUTIVE AND SALES OFFICES.

No space is provided for executive or sales offices in this plant. Usually, when the factory is within a short distance of the market for the product, the sales and executive offices are located there. Many concerns also prefer to have the auditing, accounting, and bookkeeping done outside of the factory. However, if the circumstances made it advisable to locate these departments at the factory a separate building could very handily house them. The office space indicated in O is for production managers, planning and ticket offices, and the keeping of production and cost records.

TENNIS MAKING ROOM.

The other side of the U on the third floor is devoted to tennis making entirely. In division P the parts are assembled, cemented, seamed, stitched, eyeletted, and put up ready for making in room Q. The runway to the elevators provides a passage for unfinished material from the preparatory department and an exit for the finished shoes on their way to the vulcanizers. The flouring room on the first floor is fitted up with blowers to

remove the excessive dust. All white tennis shoes are sent there before curing and buffed with a coating of talc or whiting.

VULCANIZERS.

The vulcanizers are located in L between the two sides of the U, directly over the boilers and next to the elevators from the making rooms with a direct exit on the other side to the packing room. Both steam and dry-cure heaters with several automatic varnish dipping machines form the major part of the equipment of this room. Shoes are placed on racks in cars which operate on rails throughout the plant.

GUM SHOE, GAITER, AND BOOT MAKING ROOMS.

On the fourth floor, the making rooms for gum shoes, gaiters, and boots occupy the largest position of the space. Room S has a capacity of 15,000 pairs of light gum shoes and gaiters, and room T 1,000 pairs of boots, making the total capacity of the plant, including tennis, from 20,000 to 25,000 pairs per day. The benches in the making room are 4 by 25 feet and fitted up with racks for linings, juniors, uppers, and outsoles and partitions for lasts. The foreman's office is placed on a mezzanine floor over the insole table. The last bins U are located conveniently to the making room and are connected with the packing room by a lift, permitting easy and direct return of the lasts after stripping. The pattern room and laboratory find a place with the restaurant between them and the bins.

PACKING ROOM.

The packing room receives the shoes from the vulcanizers, trims off the linings, strips the shoes from the lasts, inspects and packs them in case lots. Shipping space is confined to one floor as everything is sent to the jobbing house as soon as made.

ELEVATORS.

It will be noticed that there are six elevators in this plant, no more than are actually needed. Time lost in the routing of material is just as costly as lost labor within the sphere of departments. The writer recalls one shoe factory where two elevators carry all the incoming stores, deliver all unfinished work, and take all the shoes to the heaters. The loss of time in waiting, the resulting confusion, and the terrific drawback to production from this condition made such an impression when shown up by a time-study man that steps were taken to relieve it immediately.

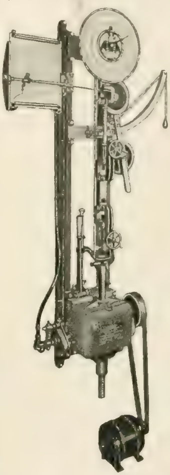
INTERDEPARTMENT LAYOUT.

This important consideration requires even more careful study than the location of the departments themselves. Sufficient space must be had for the operator of a machine to work speedily, for the unfinished material as soon as it is turned out, for the machinist to make repairs, and for the waste to be removed. Aisles must be wide enough to allow free passage for trucks. The source and location of artificial and natural lighting must be considered. Ventilation, too, is important and there can be too much as well as too little. An example of this is brought to mind where a certain operation in a shoe factory had an abnormally high labor turnover. Men rarely stayed longer than two weeks on this particular job. Investigation brought out that the table was stationed next to the elevators which were constantly being opened on both sides, making a draft and considerable dust. To add to these discomforts, a constant procession of trucks was continually crowding by and interrupting the work. This one bit of poor lay-out cost this company many thousands of dollars in labor turn-over and spoiled material before it was remedied. It is very easy to lay out the principal occupations in a department and then to crowd the rest in somewhere, but it is only storing up trouble for the future.

The cost of supervision and management depends somewhat on the plant lay-out. The accompanying rubber shoe factory could be well handled by twenty-three foremen, whereas one manufacturing less shoes than this one requires twenty-nine. Why? Simply on account of the lack of centralization of departments. But good lay-out is only a beginning for a successful enterprise. In the final analysis all the lay-outs in the world will amount to nothing if the "stuff"—the management by capable men—is not there.

RECENT IMPROVEMENTS IN TESTING MACHINES.

The pendulum type of testing machine has proved to be the most satisfactory form for use in rubber and fabric testing. By recommendation of Committee D13 of the American Society for Testing Materials it is destined to be adopted as standard. Certain improvements have been made during the past year in the well-known Scott machine. For testing tire cords a lighter capacity head has been developed in order that autographic records of these tests may be made. The illustration shows the machine equipped for this work, although arranged for fabric testing and not for cord.



Combination Fabric and Cord Tester.

A new testing head of 80 pounds capacity, graduated by fifths of pounds, is now available for use on rubber tests in light gages. This head has the short swing of the pendulum lever, the maximum reading of the machine being reached inside of the 36 degrees of swing of the pendulum. This machine with its recorder has also proved valuable for taking adhesion or friction tests, and for this work it is advisable to reduce the speed of the pulling jaw to one or two inches per minute. This can be done by means of special gearing which can be readily changed by the operator.

A transmission gear equipment capable of producing a wide variety of speeds has been perfected. As ordinarily built it is arranged to give speeds of the pulling jaw of the machine of one, two, six, 12 and 20 inches per minute. With a machine equipped with such a gear box, autographic recorder, and various styles of clamps, it is possible to do a wide range of testing on a large variety of materials. The recorder has been arranged to stop at the time of reverse of the machine, and is reset by the operator.

Special Head for Light Gage Rubber Tests.

The Venturi or capillary type of pen has proved the most satisfactory form. With suitable ink this pen is capable of giving long service at one filling and a dry record as soon as it can be removed from the machine.

Motor-Truck Efficiency as Related to Solid and Pneumatic Tires.

By S. V. Norton.[1]

There are two ways of viewing the problem of pneumatics on motor trucks. One is to consider it in the light of future changes and improvements in truck design which may become possible through the use of air tires, and the other is to look at it from the position of the present-day operator who wants to know whether he can safely avail himself of the advantages claimed for them. In the one case it is like throwing the spotlight on the theoretical side of truck design to see what it may be like ten or fifteen years from now. In the other it is like asking an experienced business man or a banker whether, by making certain investments, you can save or earn some money.

While future improvements in truck design are highly important, they are of perhaps more interest to the designing engineer than to the operator of a truck built for present-day service. Hence, I have sought information from sources which would throw light on the problem of whether trucks as built to-day should use solid or pneumatic tires. The results of a nation-wide canvass of truck manufacturers, truck salesmen, and operators as well as tire dealers and those on whose local service the truck depends are set forth in this article.

WHY PNEUMATICS ARE USED.

At present, the accepted field for pneumatics appears to be on trucks up to 1½ tons capacity, and that for solids on trucks of 3½ tons or over. Between these two capacities the choice should be made only after a careful study of the important factors involved in each case. In order to ascertain why pneumatics were used, I asked several hundred motor-truck and tire salesmen as well as truck operators throughout the United States to state what they considered was their chief advantage in this debatable field. The following reasons were given, with the percentage of replies for each:

Advantage.	Per cent.
Greater traction	40
More cushioning	28
Higher speed	21
Lower repair bills	5
Saving in gasoline	4
More work possible	2
	100

Other reasons were given for the use of pneumatic tires but they were thought to be of secondary importance. They were: less breakage of load, reduced fatigue of driver, less depreciation of truck, reduced depreciation of roads, adaptability of truck to farm use, lighter weight trucks possible, and increased earning power.

DEPENDABLE INFORMATION LACKING.

The replies to my questions show a surprising lack of dependable information, as the following quotations will indicate:

"This question is one that comes up very frequently," said a large Eastern city truck agent, "and a complete discussion of the merits of the two types would be advantageous to us."

A tire salesman who has made many inquiries writes, "Some operators who have kept fairly complete records on gas, oil, and repairs say they have nothing they consider convincing as to comparative savings effected by pneumatics."

An exceptionally well-informed publisher in Chicago says, "Operators of large size pneumatics haven't had them long enough to decide as to their relative value. Moreover, it is surprising to find how few operators keep accurate cost records."

A Seattle tire agent says, "Operators using pneumatics have been entirely sold from a theoretical standpoint due to the missionary work of the advertiser, with no analysis of conditions."

These remarks and many others of a similar nature indicate that a careful study should be made before deciding which type of tire should be used. The factors bearing on the problem may be divided into : (1) the engineering aspects involved; (2) the practical operating features encountered by the driver, and (3) the features of tire service in the community in which the truck is running.

Occasions Sometimes Arise when Truck Overloading Is Unavoidable. In Such Cases, Solid Tires Prove Their Worth. The Truck Shown above Carries 22,060 Pounds of Steel Beams. The Load Was Brought over Bad Stretches of Road between Pittsburgh and Akron without Mishap.

In taking up the engineering aspects I speak frankly as a layman and not as a truck engineer.

DISADVANTAGES IN CHANGING TIRE EQUIPMENT.

Before changing tire equipment from solids to pneumatics the operator should realize that, in order to gain certain possible advantages, he must face other definite disadvantages. In the first place he will have to cut down the wheels of the truck, which will prove a considerable item of expense. Moreover, proper allowance must be made for both body and fender clearance. It should also be remembered that the larger sectional diameter of the pneumatic tires will affect the steering clearance, and that the truck will be unable to turn in as short a radius as it did on solid tires.

As the larger diameter of pneumatic tires will affect the gear reduction, if substituted for solids, the mechanical ability of the truck will be affected. If the change is made, will the truck be able to "make the grade?" Will it materially affect the payload capacity of the truck? Will it reduce the ability to operate trailers? What will the effect be on the engine?

The increased maximum speed due to the larger diameter of the pneumatic tires will be relatively slight provided the engine is governed to run at the same speed as formerly. If the change is made to get more speed out of the machine, the gear ratio must be reduced, which reduces the ability of the truck, or the governor must be opened and the engine speed increased. There is danger here, however, as speed induces extra vibration, joints begin to loosen, and before long the engine may be literally racked to pieces.

Additional speed calls for greater braking ability. Brakes designed for slower speeds but used under more severe circumstances will inevitably require more frequent renewal. The question for the truck owner to decide before making the change is whether the truck can be equipped with brakes having much larger capacity, and if not whether it will pay to take the chance.

Of no less moment than the features mentioned above, so far as the dependability of the truck is concerned, is the question of air supply. Since pneumatic tires require from 90 to 160 pounds

[1]The B. F. Goodrich Rubber Company, Akron, Ohio.

inflation pressure, hand pumping is out of the question and a power-driven pump on the truck or close at hand becomes a necessity. In many cases this is not practicable.

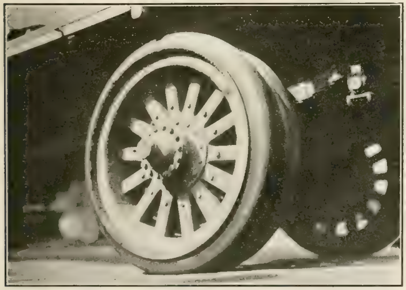
TRUCK MANUFACTURERS' OPINION IMPORTANT.

While these mechanical considerations apply particularly to using pneumatics on trucks now in operation on solid tires, most of the same problems are involved in changing the equipment on trucks manufactured but unsold. The truck buyer should satisfy himself that his agent's counsel on the equipment is based on positive facts and endorsed by the manufacturer. Otherwise he may expect more or less disappointment and dissatisfaction over the performance of his truck if he orders the equipment changed to pneumatics before delivery.

To sum up, since so many important technical features are involved, the operator or prospective buyer would do well to seek the advice of the manufacturer of his truck before changing the equipment. No one else knows so well the probable effect on various parts nor can advise more intelligently as to the probable loss or saving such a move would entail on the mechanism of his truck.

TRUCK EFFICIENCY DEPENDS ON SAVING TIME AND MONEY.

Let us now look at the practical operating features that must be considered in determining which type of tire will make the truck most efficient in service. Broadly speaking, the efficiency of a truck in performing its function depends upon the amount of time or money, or both, that is saved for the shipper, as compared with any other means of haulage. While it is difficult to separate all the factors bearing on these two items, they may be roughly classified as follows:



Solid Tires Are Indispensable if Delivery of the Load Must Reach Its Destination without Fail at Time Promised, if Regular Delivery Is More Important Than Either Speed or Cost of Delivery or if the Car Carries Overloads Beyond the Rated Capacity of the Truck.

The factors affecting time are: Distance of hauls; traffic congestion; speed of delivery; regularity of delivery; condition of roads (effect on speed of truck); number of trips per day; and time out for repairs, etc.

The factors affecting money are: Amount of pay load and overload; condition of roads (effect on tires and truck); number of trips per day; cost of operation; cost of up-keep, and cost of substitute equipment.

In what way does the tire equipment bear on these factors?

THE EFFECT OF PNEUMATICS ON TIME FACTORS.

Let us see how pneumatic tires may affect the time factors. If the operator is engaged in long-distance hauling with relatively few stops, pneumatic tires will almost invariably save running time, due to the fact that they absorb the road shocks so much more easily than solids. It should also be noted that the driver's fatigue in such cases is far less on pneumatics than on solids. Up to the present, however, comparatively few trucks are engaged in long-distance hauling. The great majority of trucks operate in cities where they cannot possibly obtain a speed of over ten miles an hour. For such speeds there can be no possible saving in time which would offset the extra cost of running on pneumatic tires.

The condition of road surface has a very important bearing on the time element, as it has a direct effect on the speed of the truck. In fact, under certain circumstances the increased traction afforded by the heavy duty pneumatic makes it possible to operate the truck while if it is equipped with solids it cannot be driven at all. This is particularly noticeable in rural districts where there are no hard-surfaced roads. One of the advantages frequently mentioned is the greater number of trips per day which may be obtained from a truck equipped with pneumatics. So far as this factor by itself is concerned, there is no doubt that the advantage is in favor of pneumatics.

There is one more important factor to be considered as affecting the time element, and that is the number of hours the truck is laid up for repair. Barring occasional lay-ups caused by defective material or workmanship, solid tires can be depended upon to give uninterrupted service from the time they are applied until worn down to the point. They can then be replaced without serious loss of time. Owing to the comparative vulnerability of pneumatic tires, they are far more likely to require time out for repairs and replacements. Punctures do not seem to be so frequent or so costly in point of time as blow-outs due to cutting and chafing of side walls from ruts, as well as to under-inflation and overloading.

When we come to compare the time out for causes other than tire trouble, we find a variety of conflicting claims, though it seems to me the evidence favors the use of pneumatics. It is claimed by some that the use of pneumatic tires accelerates the wear on certain parts, such as bearings, bushings and steering knuckles, and that a correspondingly greater amount of time is required for the adjustment and renewal. Moreover, many owners state that the use of pneumatics on trucks causes their drivers to overspeed and take more dangerous chances that result in accidents and time out for otherwise unnecessary repairs than is the case on solids.

THE QUESTION OF PAY LOAD.

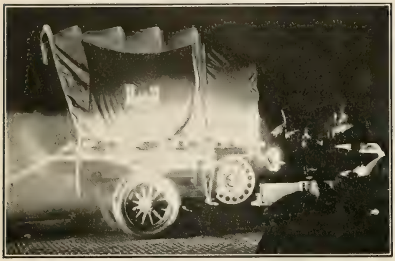
The amount of work a truck can perform and hence the saving or profit it will show depends largely upon the amount it can carry; in other words, its pay load. There is a well-nigh universal tendency to overload trucks beyond their rated capacity and it is not uncommon to find trucks carrying twice their rated capacity. When it comes to standing up under this usage, there seems to be no doubt that solid tires will not only carry heavier overloads, but will last longer in such service. This seems to me the most important and least understood factor in the entire list. Apparent savings may be offset or overbalanced by the additional trips that become necessary when an overload cannot be carried.

Closely allied to the cost of overloading pneumatic tires is that of underinflation. The constant and extreme flexing caused by overloading has a tendency to weaken the side wall, making it much more likely to fail in service. While solid tires are not invulnerable they can stand more abuse and are less expensive to maintain in working condition. In addition to the likelihood of incurring expense from overloading and underinflation, there is the danger of ruining pneumatic tires from running them after being punctured or blown out. It is not uncommon for practically new tires to be ruined by drivers who do not stop their trucks as soon as they begin to suspect tire trouble.

In attempting to collect data as to mileage on pneumatics, I found many varying claims, ranging from 200 miles under adverse conditions to 25,000 miles on lighter trucks, over good roads with proper care. With rare exceptions the mileage delivered by solid tires is considerably greater than that from pneumatics in the same class of service. When the earning capacity of the truck

concerned is judged by the number of trips per day, the advantage seems to lie with pneumatic equipment, provided the runs are long enough and not restricted by such factors as traffic congestion and delays at terminals.

As I suggested before, there are certain conditions under which trucks on pneumatics can make trips when those on solids cannot be operated. Hence, their earning capacity is just so much greater. It has been noted that trucks on pneumatics not only negotiate the unpaved roadways more easily but do less damage than those on solids, and hence are looked upon with more favor by the farmers they serve.



PNEUMATIC TIRES ARE USED BY THE ENGINEERING CORPS OF THE WAR DEPARTMENT ON TRUCKS WHICH CARRY THE HUGE SEARCHLIGHTS USED TO SPOT ENEMY AIRCRAFT. THE DELICATE MECHANISM OF THE SEARCHLIGHTS MAKES NECESSARY THE GREATEST POSSIBLE PROTECTION FROM ROAD SHOCK.

RELATIVE EFFECTS ON OPERATION COSTS.

When we come to consider the relative effects of solids and pneumatics on the cost of operation and up-keep we find a wide variety of opinions, but very few conclusions based on accurate cost records.

Let us examine briefly the items which should be included in such costs, and see how they are affected by solid and pneumatic tires. The following items are usually not affected by tire equipment: interest on investment; insurance; taxes and license; garage; supervision; wages of drivers and wages of helper. The following, however, may vary according to the type of tires used: depreciation; gasoline; oil; tires; repairs due to wear and tear and accident.

Taking them up in the order given, there are, so far as I know, no dependable figures covering depreciation on which to make comparisons, as no trucks have been run long enough on pneumatics to determine their effect on the ultimate life of the truck. As to the relative consumption of gasoline and oil, very few reliable figures are available, but the best-informed operators are inclined to feel there is little if any saving in these items, particularly on short hauls. On long hauls, however, the advantage seems to lie in favor of pneumatics.

When it comes to tires there is no question. The cost of pneumatics averages from two to three times that of solids. This is due to the higher initial cost of the equipment and the spare tires, their greater susceptibility to abuse and accident, and their lower average mileage.

So far as the cost of repairs to the truck is concerned, comparative data of a reliable nature cannot be obtained. The evidence indicates, however, that, except for the engine, the cost of repairs will be considerably less on pneumatics than on solids, due to the reduced vibration. And if the engine is not run at excessively high speed or continually overworked it will prove less subject to damage on pneumatics.

Summing up the factors affecting the saving of time and money, I have come to the conclusion that no general claims in favor of pneumatic equipment on trucks as a whole coming in the debatable field can be substantiated, and that the work to be done by each specific installation must be analyzed carefully before either type of tires can be safely considered the more economical.

THE QUESTION OF SERVICE.

Having reviewed the engineering features and the practical operating features, let us now see what the operator faces in so far as tire service is concerned. As the nature and extent of service of the maintenance and renewal of solid tires are well known, it seems unnecessary to comment on them except to say that years of study and competition have developed this end of the business to a high degree of perfection, so that the operator can depend upon many well-equipped service stations for instant attention, either in the day or night.

The manufacture of heavy-duty pneumatic tires of six-inch section and larger, is, however, a relatively new development. Less than a third of the manufacturers of passenger-car tires have started actively to make heavy-duty pneumatic truck tires, for they realize that the job of building a tire which will stand up under the use and abuse to which it is subjected nowadays is not easy. Moreover, the task is not finished when the tire comes out of the heater. It must be sold to the dealer, who, in turn, must not only stand behind the tire, but place himself in position to give the truck operator service. This means he must install a high-pressure air-pump, repair material and molds for vulcanizing and in most cases a service car for emergency calls, as it must be remembered the tire is apt to fall away from its base and it cannot be driven home flat.

It may be said, without fear of contradiction, that the tire companies themselves are not as yet prepared to give really efficient service in all parts of the country. In fact, even in the principal cities this phase of the business has not been fully developed. In the smaller towns there are almost no air tanks or pumps to keep tires properly inflated. Pumps on trucks themselves are reported as not always dependable, sometimes requiring from 15 minutes to half an hour to secure the desired pressure in a tire.

PNEUMATIC TIRES ARE IMPERATIVE UNDER SOME COMBINATION OF THE FOLLOWING FACTORS: TRACTION ON ANY KIND OF ROAD SURFACE, OR OFF THE ROAD, WITH COST SUBORDINATED; SPEED WITH COST SUBORDINATED, OR WHEN PROTECTION OF MERCHANDISE FROM ROAD SHOCK IS ESSENTIAL.

PNEUMATICS DIFFICULT TO REPAIR.

By far the most serious and difficult phase of giving service with heavy-duty pneumatics, and that which causes the most concern to truck operators, is connected with the repair. In fact, the chief complaint in regard to pneumatic truck tires, aside from their high initial cost, is that they are subject to injuries, cuts and damage generally of such a nature that they cannot be repaired except at the factory where they are made, or in a few cities at a factory branch, and often they are damaged beyond all repair. This is not only expensive, but frequently necessitates the purchase of more than one set of spares should the first set be injured while the others are being re-

paired. Oftentimes the principal cost of punctures or blow-outs is due to the necessity of laying up trucks awaiting new tires, due to stock shortage, or sending the damaged tires to the nearest factory branch for repair. Moreover, repaired casings frequently deliver but small mileage due to the overcure of the joined portions. This danger is most difficult to overcome in the large sections due to the longer cure required to vulcanize the interior portions of the new part of the casing. No doubt this feature will ultimately be corrected. The tread seems to give less trouble than the side walls which are more susceptible to rut wear and overloading abuse.

FIELD OF USEFULNESS CLASSIFIED.

The field of each type of tire may be separated into three classifications within which the operator may reasonably place his installation, and select his equipment accordingly. These may be called: (1) The imperative field; (2) the economic field; and (3) the optional field.

The factors that would bring a truck within the "imperative" field for solid tires are: reasonably hard road surface, dependability of delivery, regularity of delivery, and heavy loads with frequent overloads.

If delivery must positively reach its destination without fail at time promised; if regular delivery is a more important factor than either speed or cost of delivery, or if it carries overloads beyond the rated capacity of the tires, solid tires should be used.

Similarly, the factors that would bring a truck within the "imperative" field for pneumatics are some combination of the following: traction on any kind of road surface, or off the road, with cost subordinated; speed with cost subordinated, or protection of merchandise from road shocks.

The factors that would bring a truck within the "economic" field for solid tires are: short hauls in cities where speed is relatively unimportant; heavy loads with tendency to overloads; traffic congestion which reduces average speed; loading and unloading delays and need for low delivery cost.

Similarly those that would bring the truck within the "economic" field for pneumatic tires are: road conditions which will not prematurely destroy the tires; long hauls; high average speed; relatively light loads with no overloads; tire service conditions good and low cost subordinated to quick service.

In analyzing the "economic" field the operator must decide first whether he can avail himself of the potential speed pneumatic tires would give him. This, of course, includes the possible delays he may encounter due to tire trouble as a result of bad road conditions and those he will find, provided the tire service conditions in his locality cannot be depended upon. Next he must be sure that the features of his service provided by pneumatics will justify their extra cost.

The distinction between "economic" and "optional" fields is difficult to make. In fact, the decision as to which is the better equipment may be purely a matter of personal opinion, without strong factors on either side. Hence, I shall not attempt to define them. One of the most interesting significant developments which I have noticed in studying this subject, however, is the growing tendency among truck operators to use pneumatic tires on front wheels where the need for protection from vibration is the greatest, and solids on the rear to carry the burden of the load. This practice has much to commend it, and should steadily grow in favor.

CONCLUSION.

The movement toward the use of pneumatics should not be condemned, however, for undoubtedly it will be the means of increasing the scope of usefulness of motor transportation. The question is too new to be decided theoretically or from such meager records as are now available.

In concluding, I should like to urge that designing engineers study to develop such cushioning effects as may be possible through other means than tires, such as cushion wheels, improved springs, shock absorbers, etc. While I realize that no mechanical device is as resilient as air, we have a long way to go before we overcome the difficulties of making it serve us acceptably in puncture and fool-proof rubber tires, although the industry is making notable progress in this direction.

TWENTY-FIVE STORY OFFICE BUILDING FOR FISK RUBBER CO.

The new Fisk Rubber Company Building will be on the south side of Fifty-seventh street, New York City, running from Broadway to Eighth avenue, the site now occupied by the

The Fisk Rubber Company Building.

Rutland and St. Augustine apartment houses. It will be twenty-five stories high, five stories higher than any other building north of Times Square. The front will be of brick and limestone, with rows of marble columns from the fifteenth to the twentieth floors, which are set in, giving a tower effect. The first floor, which will be 21 feet high, will be used as automobile showrooms. The Fisk company will pay a net annual rental of $600,000.

The land and building for the Fisk structure will cost $7,050,000. The corporation owning it is called the 1767 Broadway Company, of which H. T. Dunn, who is head of The Fisk Rubber Co., is president, and includes among its stockholders, besides The Fisk Rubber Co., the Willys-Overland Co. and the Willys Corporation.

The building will stand out prominently in the heart of the automobile district, as the industry promises to monopolize Columbus Circle before long. Close at hand are the salesrooms of the Chevrolet Co., the Kelly-Springfield Tire Co. and the Ford Motor Co.

NOSTIX COMPOUND.

Nostix compound, it is claimed, will prevent retread or sectional repairs from sticking in the molds. It is a blue-gray powder that is mixed with high test gasoline and applied with a brush to the old gum of retreads, sectional repair side walls and cold bead plates. After the cure it is brushed or washed off, leaving an azurine finish. (The Siek Manufacturing Co., Carmi, Illinois.)

Rubber Tariffs of Asia, Oceania, and Africa.

THE VALUE of the exports of manufactured rubber goods from the United States to Asiatic countries in 1919 was almost exactly double what it was in 1918, the bulk of the increase being in automobile tires and rubber shoes; the figures are $5,222,693 for 1919 and $2,675,636 for 1918. The largest customer, as usual, was Japan, which more than doubled its purchases, taking $1,469,076 worth of American wares, against $692,828 the year before, folowed by the Dutch East Indies and British India with over $800,000 each, and the Straits Settlements with over $700,000. Japan bought more than three times as many tires, $425,432 against $118,685, and nearly six times the number of shoes, 393,679 pairs instead of 67,330; the quantity of miscellaneous rubber goods was more than doubled, $276,280 instead of $129,559. Siberia is opening up again after being closed to commerce; it took $558,025 worth of goods last year and only $12,097 in 1918. Tires accounted for $266,674 of this, and rubber shoes for $204,823. China's quota was over two and one-half times that of 1918, $557,391 against $197,342; of this, $254,784 was for tires. The tire demands of British India ($557,396), of the Straits Settlements ($636,101), and of the Dutch East Indies ($686,873) were also large increases and formed the greater part of their importations of American rubber goods.

In Oceania the increase of exports was slight, being $5,158,885 in 1919 and $4,875,147 in 1918. A falling off of over half a million in Australia was made up by increases in New Zealand and the Philippines. Australia and New Zealand each took over $1,300,000 worth of American rubber goods, and the Philippines $2,300,000. Preferential tariffs in the British colonies, strongly favoring goods from Great Britain, have been put in force in each. Imports of tires in Australia fell from $1,144,405 in 1918 to $751,584 in 1919, while in New Zealand they rose to $1,023,807 from $950,985; in the Philippines the imports of tires were $1,372,544 against $982,224 the year before. There was a marked diminution of more than half in belting for Australia, while rubber shoes and druggists' supplies increased. In New Zealand the increase in belting and rubber boots was marked. With the British absorption of German Oceania and the elimination of the Philippines, the Oceanian statistics will refer almost exclusively to British possessions.

Exports to Africa rose in 1919 to $1,676,014 from $1,391,530 in 1918, over three quarters, $1,294,798 worth, going to British South Africa, which seems to have become a steady and permanent customer for American goods. It took automobile tires to the amount of $479,934, as against $591,378 in 1918; belting worth $564,972, instead of $472,235, and miscellaneous rubber goods to the amount of $136,183, instead of $75,435. British West Africa took $122,940 worth of tires as compared with $43,948 in 1918. It may be noted that British East Africa took $32,000, French Africa $28,000 and Portuguese Africa $25,000 of American tires in 1919. Belting to the amount of $70,000 to the Belgian Congo seems to be an isolated case, but the $50,000 of belting that went to Portuguese Africa follows on $64,000 sent the year before.

The succeeding extracts from the tariffs of the principal countries of Europe show the competition to which rubber manufacturers of the United States are subject under existing tariff conditions. Owing to frequent tariff changes the figures and information given below should be periodically verified and small trial shipments made to test the rates.

UNITED STATES EXPORTS OF RUBBER GOODS TO ASIA, OCEANIA AND AFRICA.

Calendar Years 1918 and 1919.

EXPORTED TO—	Belting, Hose and Packing.	Boots.		Shoes.		Druggists' Rubber Sundries	Tires.		All Other Manufactures of Rubber.	Total
	Value.	Pairs.	Value.	Pairs.	Value.	Value.	Automobile. Value.	All Other. Value.	Value.	Values.
ASIA:										
Aden	......	....	....	....	......	....	$1,847	....	....	$1,847
China	$83,330	315	$888	98,031	$106,099	$21,418	254,784	$8,618	$82,224	557,361
Japanese China	574	808	1,697	8,797	10,192	252	1,425	....	8,924	23,064
Chosen	2,704	48	304	1,394	1,218	162	11,538	150	3,879	19,955
British India	88,374	4	16	8,255	6,429	18,724	557,396	23,154	108,427	802,520
Straits Settlements	13,437	12	30	2,413	2,596	2,693	636,101	14,858	64,652	734,367
Other British East India	4,380	...	....	320	163	322	18,477	....	1,857	25,199
Dutch East Indies	36,466	3	18	1,974	2,735	4,096	686,873	40,335	65,570	836,093
French East Indies	16,806	.....	....	24	15	167	7,518	305	483	25,294
Hongkong	12,684	373	1,089	8,192	7,424	2,656	79,334	2,204	12,641	118,032
Japan	301,792	28,517	56,022	393,679	390,663	16,779	422,432	5,108	276,280	1,469,076
Persia	.....	....	....	....	....	......	1,092	....	....	1,092
Russia in Asia	36,272	6,165	21,860	162,340	204,823	11,064	266,674	.....	17,332	558,025
Siam	1,830	....	....	234	281	842	12,239	505	2,487	18,184
Turkey in Asia	1,016	223	669	13,981	16,492	81	12,734	......	1,592	32,584
TOTALS, ASIA, 1919	$599,665	36,468	$82,593	699,634	$749,130	$79,256	$2,970,464	$95,237	$646,348	$5,222,693
TOTALS, ASIA, 1918	553,323	5,012	13,408	85,306	79,904	46,874	1,624,319	50,814	306,994	2,675,636
OCEANIA:										
Australia	$199,101	1,773	$5,478	151,673	$99,477	$54,071	$751,584	$32,469	$199,569	$1,341,749
New Zealand	123,653	14,734	41,609	15,272	17,549	17,067	1,023,807	29,637	124,917	1,378,239
Other British Oceania	1,297	...	......	753	1,329	295	7,118	282	987	11,308
French Oceania	2,974	....	.....	1,336	1,558	52	13,516	3,733	2,857	24,690
German Oceania	29	11	33	241	334	...	8,862	546	2,718	12,522
Philippine Islands	279,282	1,319	2,878	153,305	146,311	26,273	1,372,544	125,522	437,567	2,390,377
TOTALS, OCEANIA, 1919	$606,336	17,837	$49,998	322,580	$266,558	$97,758	$3,177,431	$192,189	$768,615	$5,158,885
TOTALS, OCEANIA, 1918	704,806	9,489	7,896	280,001	214,644	60,760	3,112,503	177,710	576,828	4,875,147
AFRICA:										
Belgian Kongo	$70,467	.	.....	4	$5	......	.....	....	......	$70,472
British West Africa	10,335	[illegible]	$13	71	148	$282	$122,940	$268	$1,747	135,733
British South Africa	564,972	3,969	12,385	67,377	54,368	19,019	479,934	27,937	136,183	1,294,798
British East Africa	21	.	....	372	230	42	32,402	....	1,835	34,530
Canary Islands	....	...	....	.....	.	......	4,545	7	....	4,552
French Africa	5,767	1	3	....	. .	......	28,821	132	596	35,319
German Africa		......	....	......	......	5	....	.....	12	17
Italian Africa	2,579	.	....	...	...	....	......	......	....	2,579
Liberia		. .	.	8	20	21	45	. .	4	90
Morocco	904		....	300	255	.	225	.....	...	1,384
Portuguese Africa	50,791	184	823	32	101	463	150	405	2,772	55,505
Egypt	3,143		..	1,043	911	219	25,881	2,999	7,882	41,035
TOTALS, AFRICA, 1919	$708,979	4,156	$13,221	69,207	$56,038	$20,051	$694,943	$31,748	$151,031	$1,676,014
TOTALS, AFRICA, 1918	543,568	3,341	12,356	118,880	76,841	7,610	644,355	28,122	78,678	1,391,530

(Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.)

Asia.

BRITISH INDIA.

Equivalents.—Rupee (16 annas), 32 cents; 1 anna (12 pies), 2 cents; Maund, 82 2/7 pounds.

Tariff No.		Tariff Valuation. Rs. a.	Duty. Per Cent.
77.	All sorts of belting	*Ad valorem.*	2½
114	All kinds of packing	*Ad valorem*	7½
121.	Tires and tubes and other manufactures of rubber not otherwise specified	*Ad valorem.*	7½

CEYLON.

Equivalents.—Rupee, nominally 32 cents.

Crude rubber is exempt from import duty, but there is an export duty of 7.50 rupees per 100 pounds of rubber.

CHINA.

Equivalents.—Haikwan tael, 48.625 cents; picul, 133⅓ pounds.

	Tariff Unit	and Duty.
India rubber and gutta percha, crude	*picul*	3.140
Boots	*pair*	0.080
Shoes	*pair*	0.020
Waste	*picul*	0.250
All other articles of rubber	*ad valorem*	5%

DUTCH EAST INDIES.

The governments of West Coast of Sumatra, Celebes and dependencies; residencies Tapanoeli, Benkoelen, districts Lampong, Palembang, Djambi, Banca and dependencies; West Division of Borneo, Menado, Amboina, Ternate and dependencies; Timar and dependencies, and Billiton levy an export duty of 5 per cent ad valorem on rubber, gutta percha, and other gums.

The tariff for South and East Borneo is 8 per cent ad valorem on rubber, gutta percha and other gums.

The tariff for East Coast Sumatra, Indragiri division, Kateman territory, Riau, Danei, is 5 per cent ad valorem on rubber, gutta percha and other gums. For the Singkel division of Atjeh this is also 5 per cent, for Tamiong 8 per cent, for Grand Atjeh and other portions of Atjeh except Waay Island, 10 per cent ad valorem.

Exemption from duty (Dutch East Indies) is granted for plantation rubber and gutta percha, provided that the exemption be warranted by a certificate issued by a European official in charge of the administration.

On automobiles and accessories imported into the Dutch East Indies a duty of 10 per cent ad valorem is levied.

FEDERATED MALAY STATES.

Equivalents.—Dollar, about 56 cents; picul, 133⅓ pounds.

Import Duties.		Duty. Dollars.
Motors, cycles and accessories	*ad val.*	10%
Export Duties.		
Gutta percha, cultivated	*ad val.*	2½%
Jelutong	*per picul*	0.50
Rubber—Any cultivated rubber. When the value of the highest grade is		
1*s.* 6*d.* per lb.	*per picul*	0.27
Over 1*s.* 6*d.* ... under 1*s.* 6½*d.* per lb.	*per picul*	0.40
Over 1*s.* 6½*d.* ... under 1*s.* 7*d.* per lb.	*per picul*	0.53
Over 1*s.* 7*d.* ... under 1*s.* 7½*d.* per lb.	*per picul*	0.67
Over 1*s.* 7½*d.* ... under 1*s.* 8*d.* per lb.	*per picul*	0.80
Over 1*s.* 8*d.* ... under 1*s.* 8½*d.* per lb.	*per picul*	0.93
Over 1*s.* 8½*d.* ... under 1*s.* 9*d.* per lb.	*per picul*	1.07
Over 1*s.* 9*d.* ... under 1*s.* 9½*d.* per lb.	*per picul*	1.20
Over 1*s.* 9½*d.* ... under 1*s.* 10*d.* per lb.	*per picul*	1.33
Over 1*s.* 10*d.* ... under 1*s.* 10½*d.* per lb.	*per picul*	1.47
Over 1*s.* 10½*d.* ... under 1*s.* 11*d.* per lb.	*per picul*	1.60
Over 1*s.* 11*d.* ... under 1*s.* 11½*d.* per lb.	*per picul*	1.87
Over 1*s.* 11½*d.* ... under 2*s.* 0*d.* per lb.	*per picul*	2.13
Over 2*s.* 0*d.*	*ad val.*	2½%
Latex: a gallon of latex being taken as equivalent to 1 pound of cultivated rubber of the best quality	*ad val.*	2½%

PROTECTED MALAY STATES.

KEDAH: Export duty.		
Rubber (wild)	*ad val.*	15%
Rubber (plantation)	*ad val.*	2½%
PERLIS:		
Rubber	*ad val.*	2½%
KELANTAN:		
Import duty.		
Rubber seeds		Free.

JAPAN.

Equivalents.—Yen, about 49 cents; kin, 1.32277 pounds.

Tariff No.			General Tariff, Yen.
	CRUDE RUBBER, ETC.		
143.	Crude rubber, gutta percha, and substitutes thereof		Free.
	PASTES, ETC.		
629.	1. Rubber solution, including receptacle	100 *kin*	18.10
	2. Rubber paste, reclaimed rubber and other unvulcanized rubber	*ad valorem*	20%
	BELTING, HOSE AND PACKING.		
629.	4. (A-4) Tubes:		
	(a) Armored with metal, inside or out	100 *kin*	15.30
	(b) Other:		
	(b-1) Combined with tissues, yarns, cord, metal	100 *kin*	13.80
	(b-2) Other	100 *kin*	93.20
	A-5 Belts	100 *kin*	22.20
	BOOTS AND SHOES.		
355.	1. Boots:		
	B. Rubber	100 *kin*	50.00
	4. Overshoes of rubber	100 *kin*	51.60
	OTHER GOODS.		
319	Waterproof tissues, coated or inserted with rubber:		
	1. Wholly or partly of silk	*ad valorem*	40%
3.0.	Elastic webbing, cords, braids, etc.		
	1. Over 8 centimeters wide:		
	A. Partly silk	100 *kin*	148.00
	B. Other	100 *kin*	86.00
	2. Other:		
	A. Woven:		
	(a) Partly of silk	*ad valorem*	40%
	(b) Other	*ad valorem*	30%
	B. Other:		
	(a) Partly of silk	*ad valorem*	40%
	(b) Other	*ad valorem*	30%
486.	Insulated wires:		
	1. Armored with metals:		
	A. Submarine telegraphic or telephonic cables		Free
	B. Other:		
	(a) Combined with rubber or gutta percha	100 *kin*	11.00
	2. Other:		
	B. (a) Combined with rubber or gutta percha	100 *kin*	14.50
629.	3. Dental rubber	100 *kin*	75.80
	4. Other:		
	(A) Soft:		
	(A-1) In lumps	*ad valorem*	20%
	(A-2) Rods and cards.		
	(a) Combined with metal, tissues, yarns, cords, fibers	100 *kin*	8.65
	(b) Other	*ad valorem*	20%
	(A-3) Plates and sheets:		
	(a) Combined with metal, tissues, yarns, cords, fibers	100 *kin*	7.40
	(b) Other:		
	(b-1) Not over 1 millimeter thick	100 *kin*	95.60
	(b-2) Other		50.30
	(A-6) Threads, strips, bands, washers:		
	(a) Combined with metal, tissues, yarns, cords, fibers	100 *kin*	15.30
	(b) Other	100 *kin*	55.60
	(A-7) Erasers	100 *kin*	24.90
	(A-8) Water bottles	100 *kin*	48.50
	(A-9) Nipples (including inner wrappings)	100 *kin*	132.00
	(A-10) Mats and matting	*ad valorem*	30%
	(A-11) Other	*ad valorem*	40%
	B. Other:		
	(B-1) In lumps, bars or rods, plates, sheets	100 *kin*	35.40
	(B-2) Tubes	100 *kin*	38.90
	(B-3) Rings and washers	100 *kin*	43.70
	(B-4) Combs (including inner packings)	100 *kin*	157.00
	(B-5) Other	*ad valorem*	40%
630.	Waste		Free

KOREA.

Rubber, manufactured or not, is subject to a duty of 8 per cent.

PERSIA.

Equivalents.—The toman = 10 krans = 20 shahis, about 96 cents; batman, 6.54 pounds.

			Duties. t.	k.	s.
13.	1. Rubber and manufactures thereof:				
	(a) Raw rubber	*batman*	0	0	8
	(a) Rubber in plates, sheets, or threads	*batman*	0	3	0
	(c) Goloshes and other rubber footwear	*dozen pairs*	0	6	0
	(d) Oilcloth of all kinds	*batman*	0	2	0
	(e) All other manufactures of rubber, not elsewhere specified	*batman*	1	0	0
21.	2 Toys of every description	*ad val.*	15%		

Oceania.

AUSTRALIA.

Equivalents.—Pound, sterling, $4.86 (normal).

Tariff No.			Tariff on British Goods. £ s. d.	General Tariff. £ s. d.
	CRUDE RUBBER, ETC.			
331.	(a) Crude rubber; waste; hard rubber sheets; rubber thread; boot and apparel elastics; masticated rubber	*ad val.*	Free.	10%
	(b) Rubber, powdered or reclaimed	*ad val.*	10%	15%
	BELTING, HOSE AND PACKING.			
326.	Rubber, or composition belting	*ad val.*	25%	30%
374.	(b) Asbestos and rubber packings	*ad val.*	20%	25%
332.	(b) Rubber and other hose	*ad val.*	25%	35%
	BOOTS AND SHOES.			
328.	Goloshes, rubbers and boots and shoes, and plimsolls (sneakers)	*ad val.*	25%	30%
330	Gum and wading boots, rubber	*ad val.*	Free.	10%
	TIRES, ETC.			
333.	(a) Pneumatic rubber tires and tubes, valved or not, including tire fillers, cut to size:			
	(1) Covers weighing each 2½ lbs. or less; tubes weighing each 1 lb. or less	*ad val.*	25%	35%
	(2) Covers weighing each over 2½ lbs.; tubes weighing each over 1 lb.	*per lb.*	0.1.6	0 2 0
		ad val.	25%	35%
	Whichever rate returns the higher duty.			
	(3) Rubber tires other than pneumatic	*ad val.*	25%	35%
	OTHER GOODS.			
332.	(a) Syringes, enemas, injection bottles, urinals, air and water beds and cushions and pillows; cut-sheet surgical tubing	*ad val.*	20%	25%
	(b) Rubber manufactures n. e. s., articles n. e. s., in which rubber forms a part, including bandages, elastic stockings, knee caps, thigh pieces, wristlets, leggings, hat-makers' press bags and rings, gas bags, soles, pads, heels, cash mats, rubber tired fabric, tire rubber, rubber stoppers, photographic accessories	*ad val.*	25%	35%
	(c) Floor and carriage mats of rubber	*ad val.*	15%	20%

375.	(b) Atomizers, fumigators, odorizers, vaporizers, etc ....ad val.	15%	20%
379.	Blankets, rubber, for printing machines.........	Free.	Free.
399.	Fire hose, rubber-lined, 2½ inches in diameter and over ....ad val.	Free.	5%
419.	Surgical pessaries; dental rubber............	Free.	Free.

NEW ZEALAND.

Tariff No.	RUBBER CEMENT.	General Tariff. £ s. d.	Tariff on Goods of British Origin. £ s. d.
401.	Rubber solution or cement..................	Free.	Free.
	BELTING, HOSE AND PACKING.		
452c.	Rubber endless belts for concentrators (to remain free of duty after March 31, 1908).		
479A.	Machine belting other than leather, cordage or rope ....ad val.	10%	Free.
481A.	All kinds of hose, tubing or piping.......ad val.	20%	Free.
486A.	Engine packing	Free.	Free.
	BOOTS AND SHOES.		
106.	Shoes or goloshes, known as "plimsolls," with molded rubber soles..................ad val.	33¾%	22½%
107.	Champion, gymnasium, yachting and lawn-tennis boots and shoes, with molded rubber soles. ad val.	33¾%	22½%
107A.	Goloshes and overshoes of all kinds, of rubber ....ad val.	33¾%	22½%
397.	Boot elastic	Free.	Free.
398A.	Children's goloshes, sizes 0-6............ad val.	10%	Free.
398B.	Molded rubber soles....................ad val.	10%	Free.
401.	Rubber heels	Free.	Free.
486D.	Gum boots, half knee, knee or thigh, with soles of leather or rubber......................	Free.	Free.
	TIRES, ETC.		
438A.	Tires, pneumatic tires, rubber covers, inner tubes attached or not, to bicycles, tricycles, or motor-cycles	Free.	Free.
470.	The same for carriages, wagons, automobiles, etc., attached to the vehicles, or not..............	Free.	Free.
	OTHER GOODS.		
368.	Dental rubber	Free.	Free.
370.	Brace elastic	Free.	Free.
396.	Waterproof material, combined with rubber....	Free.	Free.
439.	Rubber gloves for beekeepers..................	Free.	Free.
446A.	Insulated cable and wire, vulcanite insulating material, rubber or gutta percha solutions, insulating tape	Free.	Free.
449B.	Rubber tubing, in short lengths, for handles of tennis racquets, cricket bats, etc.......ad val.	20%	Free.
489.	Rubber gloves, rubber pump valves............	Free.	Free.

Africa.

LIBERIA.

There is an export duty of 12 cents per pound on rubber from Liberia.

UNION OF SOUTH AFRICA.

Tariff No.		Rate Ad Valorem.
78.	Bands and belting of all kinds for machinery, boiler tubes, bolting, cloth and mill silk............................	3%
98.	Rubberoid	3%
109.	Unmanufactured rubber	3%
119.	Machine packing	3%
121.	Pipes, piping and tubes of all kinds......................	3%
193.	All goods not elsewhere specified.........................	20%

[Note.—3% ad valorem will be rebated on goods the growth, produce, manufacture of the United Kingdom and reciprocating British Colonies.]

British Standard List of Rubber Tyres for British Standard Rims.[1]

THE URGENT NEED for reducing the great number of sizes of rubber tyres in use on automobiles having been recognized by the British Rubber Tyre Manufacturers' Association, a scheme for that purpose was suggested by them and submitted to the British Engineering Standards Association for consideration and eventual issue as British Standards.

The scheme was considered and certain modifications were made to the proposals and these are embodied in the present report and have been accepted by the British Rubber Tyre Manufacturers' Association.

In consultation with the American Society of Automotive Engineers (one of the sponsor bodies of the American Engineering Standards Committee) the S.A.E. Standard Tyre sizes, both pneumatic and solid, have been included in the list, a further step thus being taken in the direction of Anglo-American co-operation.

As the standard list of rubber tyres is urgently required by the automobile industry, the present memorandum is issued as an interim measure pending the revision of the British standard reports affected.

The dimensions of the tyres given in this memorandum are nominal, whilst those of the rims are actual. The sizes of the tyres are the usual trade description as applied to tyres designed to fit the respective rims. Full size dimensioned drawings of the rim sections are in course of preparation.

It is to be understood that the British Engineering Standards Association in no case guarantees that the goods bearing its mark are made to the standard sections and specifications issued by it. The mark is to be regarded as no more than *prima facie* evidence adduced by the manufacturer that the goods are made in accordance with the standard sections issued by the British Engineering Standards Association.

PART 1. PNEUMATIC TYRES AND RIMS.

SCHEDULE A (SEE PLATE 1).

BRITISH STANDARD LIST OF CYCLE TYRES FOR BRITISH STANDARD RIMS.

WIRED TYPE.

Nominal Size and Marking of Tyre. Inches.	Millimeters.	Rim required.
22 × 1⅜	550 × 32	F. 2
24 × 1⅜	600 × 32	F. 3
26 × 1½	650 × 38	F. 9
28 × 1½	700 × 38	F. 10
26 × 1¾	650 × 44	F. 12
28 × 1¾	700 × 44	F. 13

BEADED EDGE TYPE.

Nominal Size and Marking of Tyre. Inches.	Millimeters.	Rim required.
26 × 1½	650 × 38	B. 4
28 × 1½	700 × 38	B. 5
28 × 1¾	700 × 44	B. 8

The above range includes all sizes regarded as necessary for the equipment of all types of cycles—juveniles, standard roadsters, and carriers—excepting only racing machines. It is not proposed to standardize either tyres or rims of special racing types.

SCHEDULE B (SEE PLATE 2).

BRITISH STANDARD LIST OF MOTOR CYCLE TYRES FOR BRITISH STANDARD RIMS.

BEADED EDGE TYPE ONLY.

Nominal Size and Marking of Tyre. Inches.	Millimeters.	Rim Required.
24 × 2¼	600 × 55	D. 1
26 × 2¼	650 × 55	B. B.
26 × 2½	650 × 65	B. B.
26 × 3	650 × 75	C. C. 1
28 × 3	700 × 75	C. C. 2

SCHEDULE C (SEE PLATE 3).

BRITISH STANDARD LIST OF LIGHT CAR TYRES FOR BRITISH STANDARD RIMS.

BEADED EDGE TYPE ONLY.

Nominal Size and Marking of Tyre. Inches.	Millimeters.	Rim Required.
26 × 3	650 × 75	C. C. 1
27 × 3½	685 × 90	C. C. 1
28 × 3½	700 × 90	28 L. C.
29 × 4	735 × 100	28 L. C.

In view of the unsatisfactory range of light car tyre and rim sizes hitherto available, this new range of two rims with two sections of tyre for each rim is adopted.

(The present 650 × 65 and 700 × 80 tyres will go on to the C.C. 1 rim.)

SCHEDULE D (SEE PLATES 4 AND 5).

BRITISH STANDARD LIST OF MOTOR TYRES FOR BRITISH STANDARD RIMS.

BEADED EDGE TYPE.

Nominal Size and Marking of Tyre.	Rim required.
Inches.	
30 × 3½	30 B. E.
31 × 4	30 B. E.
Millimeters.	
815 × 105	815 B. E.
815 × 120	815 B. E.
820 × 120	820 B. E.
820 × 135	820 B. E.
880 × 120	880 B. E.
880 × 135	880 B. E.
895 × 135	895 B. E.
895 × 150	895 B. E.

SCHEDULE E (SEE PLATE 6).

BRITISH STANDARD LIST OF MOTOR TYRES FOR BRITISH STANDARD RIMS.

WIRED TYPE FOR STRAIGHT-SIDED RIMS.

Nominal Size and Marking of Tyre. Inches.	Millimeters.	Rim required.
32 × 3½	815 × 90	S. S. 32 × 3½
33 × 4	840 × 105	S. S. 32 × 3½ or S. S. 33 × 4
32 × 4	815 × 105	S. S. 32 × 4
33 × 4½	840 × 120	S. S. 32 × 4
32 × 4½	815 × 120	S. S. 32 × 4½
33 × 5	840 × 135	S. S. 32 × 4½
34 × 4½	865 × 120	S. S. 34 × 4½
35 × 5	890 × 135	S. S. 34 × 4½

SCHEDULE E—Continued (SEE PLATE 7).

BRITISH STANDARD LIST OF COMMERCIAL VEHICLE TYRES FOR BRITISH STANDARD RIMS.

36 × 6	915 × 150	S. S. 36 × 6
38 × 7	965 × 175	S. S. 38 × 7
40 × 8	1015 × 200	S. S. 40 × 8

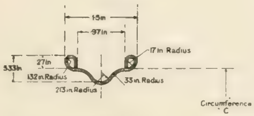
[1]Adopted by the British Engineering Association, April 14, 1920.

Plate 1.

BRITISH STANDARD

RIMS FOR CYCLES.

(WIRED TYPE.)

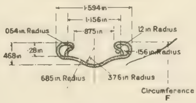


SECTION F.

Thickness ·032 in. (No. 21 S.W.G.).

Rim No.	Size of Tyre to Fit.	Circumference C.
	inches.	inches.
F. 2	22 × 1⅜	62·000
F. 3	24 × 1⅜	66·750
F. 9	26 × 1½	72·250
F. 10	28 × 1½	78·500
F. 12	26 × 1¾	70·625
F. 13	28 × 1¾	77·000

(BEADED EDGE TYPE.)



SECTION B.

Thickness ·032 in. (No. 21 S.W.G.).

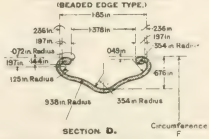
Rim No.	Size of Tyre to Fit.	Circumference F.
	inches.	inches.
B. 4	26 × 1½	73·500
B. 5	28 × 1½	80·250
B. 8	28 × 1¾	78·5625

Plate 2.

BRITISH STANDARD

RIMS FOR MOTOR CYCLES.

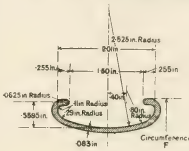
(BEADED EDGE TYPE.)



SECTION D.

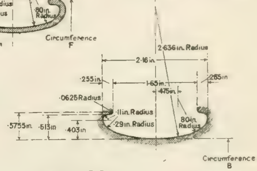
Thickness ·072 in. (No. 15 S.W.G.).

Rim No	Size of Tyre to Fit	Circumference F
	inches.	inches.
D. 1	24 × 2¼	64·174



SECTION B.B.

Rim No.	Size of Tyre to Fit.	Circumference F.
	inches.	inches.
B.B.	26 × 2¼ and 26 × 2½	71·261



SECTION C.C.

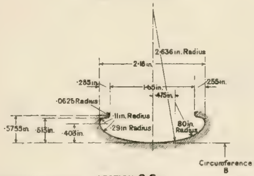
Rim No.	Size of Tyre to Fit.	Approximate Circumference B.	Rim Dia. at Tyre Seat.
	inches.	inches.	inches.
C.C. 1	26 × 3	62·832	20
C.C. 2	28 × 3	69·115	22

Plate 3

BRITISH STANDARD

RIMS FOR LIGHT CARS.

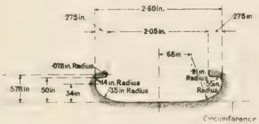
(BEADED EDGE TYPE).



SECTION C.C.

Rim No	Size of Tyre to Fit.	Approximate Circumference B.	Rim Dia. at Tyre Seat
	inches. inches.	inches.	inches.
C.C. 1	26 × 3 and 27 × 3½	62·832	20

This is the same as the Motor Cycle C.C. 1 Rim



SECTION 28 L.C.

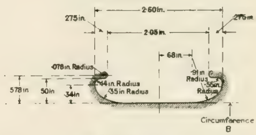
Rim No	Size of Tyre to Fit	Approximate Circumference B	Rim Dia. at Tyre Seat
	inches inches	inches	inches
28 L.C.	28 × 3½ and 29 × 4	65·975	21

Plate 4

BRITISH STANDARD

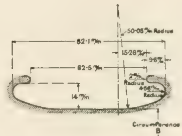
RIMS FOR MOTOR CARS.

(BEADED EDGE TYPE.)



SECTION 30 B.E.

Rim No.	Size of Tyre to Fit.	Approximate Circumference B.	Rim Dia. at Tyre Seat
	inches. inches.	inches.	inches
30 B.E.	30 × 3½ and 31 × 4	72·257	23



SECTION 815 B.E.

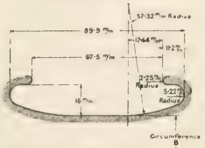
Rim No	Size of Tyre to Fit.	Circumference B	Approximate Rim Dia. at Tyre Seat
	millimetres millimetres.	millimetres.	millimetres
815 B.E.	815 × 105 and 815 × 120	1924	612·4

Plate 5.

BRITISH STANDARD

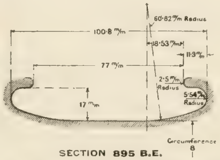
RIMS FOR MOTOR CARS.

(BEADED EDGE TYPE.)



SECTION 820 AND 880 B.E.

Rim No	Size of Tyre to Fit.	Circumference B.	Approximate Rim Dia. at Tyre Seat.
	millimetres.	millimetres.	millimetres.
820 B.E.	820 × 120 and 820 × 135	1780	566 6
880 B.E.	880 × 120 and 880 × 135	1980	630·2



SECTION 895 B.E.

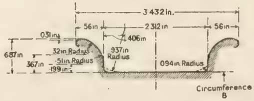
Rim No.	Size of Tyre to Fit.	Circumference B.	Approximate Rim Dia. at Tyre Seat
	millimetres	millimetres	millimetres
895 B.E.	895 × 135 and 895 × 150	1855	590·4

Plate 6.

BRITISH STANDARD

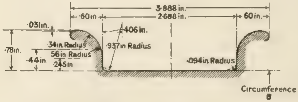
RIMS FOR MOTOR CARS.

(STRAIGHT-SIDED FOR WIRED TYPE TYRES)



SECTION S.S. 32 ins. × 3½ ins.

Size of Tyre to Fit.	Approximate Circumference B.	Rim Dia. at Tyre Seat.
inches.	inches.	inches.
32 × 3½ and 33 × 4	78·540	25



SECTION S.S. 32 ins. × 4 ins. and 33 ins. × 4 ins.

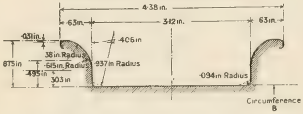
Size of Tyre to Fit.	Approximate Circumference B.	Rim Dia. at Tyre Seat.
inches.	inches	inches
32 × 4 and 33 × 4½	75·398	24
33 × 4 and 34 × 4½	78·540	25

Plate 7.

BRITISH STANDARD

RIMS FOR MOTOR CARS.

(STRAIGHT-SIDED FOR WIRED TYPE TYRES).



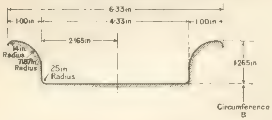
SECTION S.S. 32 ins. × 4½ ins. and S.S. 34 ins. × 4½ ins.

Size of Tyre to Fit	Approximate Circumference B.	Rim Dia. at Tyre Seat
inches	inches	inches
32 × 4½ and 33 × 5	72 257	23
34 × 4½ and 35 × 5	78·540	25

BRITISH STANDARD

RIMS FOR COMMERCIAL VEHICLES.

(STRAIGHT-SIDED FOR WIRED TYPE TYRES.)



SECTION S.S 36 ins. × 6 ins.

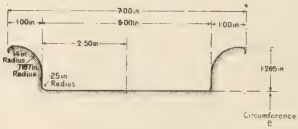
Size of Tyre to Fit.	Approximate Circumference B	Rim Dia. at Tyre Seat.
inches	inches.	inches.
36 × 6	75·398	24

Plate 8

BRITISH STANDARD

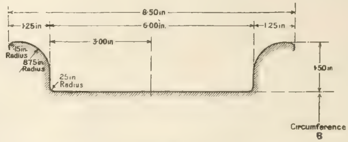
RIMS FOR COMMERCIAL VEHICLES.

(STRAIGHT-SIDED FOR WIRED TYPE TYRES).



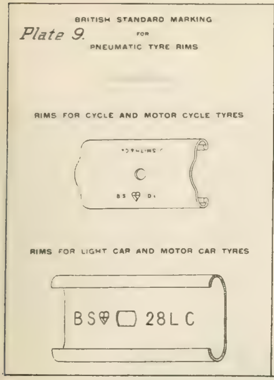
SECTION S.S. 38 ins. × 7 ins.

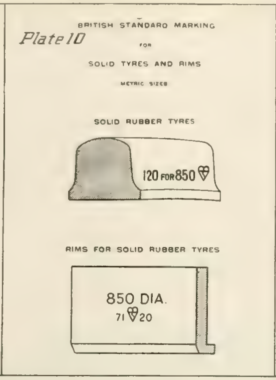
Size of Tyre to Fit	Approximate Circumference B	Rim Dia. at Tyre Seat.
inches	inches.	inches
38 × 7	75·398	24

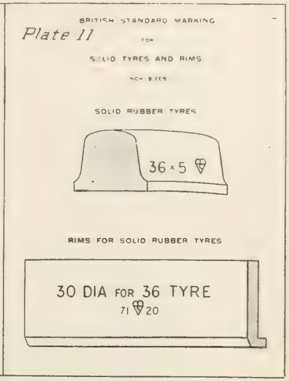


SECTION S.S. 40 ins. × 8 ins.

Size of Tyre to Fit.	Approximate Circumference B.	Rim Dia. at Tyre Seat.
inches.	inches	inches.
40 × 8	75·398	24







PART 2. SOLID RUBBER TYRES AND RIMS.

SCHEDULE F.

BRITISH STANDARD LIST OF SOLID RUBBER TYRES (PRESSED ON BAND TYPE) FOR BRITISH STANDARD RIMS.

METRIC SIZES.

Wheel Rim Diameters Millimeters	Tyre Sections (Width at Base). Millimeters					
670	..			140	160	180
720	80	100	120	140	160	180
771	.	100	120	140	160	180
850	80	100	120	140	160	180

Sections larger than 180 mm., if made as single tyres in lieu of twins, to be made to 850 mm. rim diameter only.

INCH SIZES.

Nominal Overall Tyre Diam. Inches.	Tyre Sections (Width at Base). Inches.										Actual Rim Diam Inches.
32	3	3½	4	..		..	..	..	..		26
34		3½	4	5	.	.	.	..	..	.	28
36		3½	4	5	6	7	8	10	..	..	30
40	..		..	5	6	7	.	10	12	14	34

Note.—The figure 71 in the marking in plates 10 and 11 refers to the number of the British Standard Report on Wheel Rims and Tyre Bands for Solid Rubber Tyres, and the figure 20 to the year of its issue (i. e., *Report No. 71 1920*)

THE NEED OF TIRE STANDARDIZATION.

An analysis of the size of the tires used on the cars described in the "Handbook of Automobiles" shows how far we are from standard sizes, though the majority of the passenger cars use tires that differ less than an inch from each other.

On all the pleasure cars the front and rear wheels are of the same size and out of 151 pleasure vehicles 35 have wheels with tires 32 by 4, 20 measure 32 by 4½, and 27 measure 33 by 4. The other measurements given are 35 by 5, 11 cars; 34 by 5½, one car; 34 by 4½, 24 cars; 34 by 4, one car; 33 by 5, 12 cars; 33 by 4½, 5 cars; 32 by 3½, 4 cars; 31 by 4, 5 cars; 30 by 3½, 6 cars.

The variety in the tires of commercial trucks is far greater; out of 77 trucks, 25 have front and rear tires of the same size, and of these 7 take tires 36 by 5, with front wheels single solid and rear wheels dual solid, while two have single solid tires 36 by 5, both front and rear. Six trucks take size 36 by 4, front single solid, rear dual solid; six have pneumatic tires, one 36 by 6, two 35 by 5, two 34 by 4½, and one 31 by 4. The other sizes of solid tires for cars with like front and rear wheels are 40 by 6, 36 by 7, 36 by 6 and 33 by 4, one of each.

With a few exceptions, in the case of dissimilar wheels, there are as many varieties of tire combinations as there are cars. Ten cars out of 52 take 36 by 4 single solid tires for front wheels and 36 by 7 single solid tires for the rear wheels; 5 cars, 36 by 6 single solid front and 40 by 6 dual solid rear; 4 cars, 36 by 5 single solid front and 40 by 6 dual solid rear. The other 33 cars use twenty-six different sizes or combinations of sizes, ranging from 38 by 7 pneumatic and 38 by 4 solid to 32 by 2½ solid for front wheel tires and 42 by 12 solid and 42 by 9 pneumatic to 32 by 3 solid for rear wheel tires.

One reason for the lack of uniformity in tire measurements is the great diversity in size and carrying capacity of the trucks, one being rated at 7½ tons, 12 at 15 tons, 18 at 3½, 11 at 2½, 10 at 2, with cars of every intermediate and smaller capacity down to 1,000 pounds and 750 pounds.

WESTINGHOUSE EMPLOYES INSURED.

An insurance policy for $500 will be given entirely without cost to every employe of the Westinghouse Electric & Manufacturing Co. who has been in the service of the company for a period of six months or more, according to a plan effective March 1, 1920. In addition, the employes, after April 1, may increase the value of their policies to amounts varying from $1,000 to $2,000, depending upon their length of service and continuity of savings.

All employes who have been in the company's service for six months or longer and who deposit a sum each pay-day in the Employes' Savings Fund, equal to 2 per cent or more of their earnings, will not only receive 4½ per cent interest compounded semi-annually on such deposits, but in addition will automatically have their insurance increased to amounts up to $2,000, depending on the length of time they have been with the company. For example, a man who has been in the service of the company for at least 15 years and has regularly deposited in the Employes' Savings Fund 2 per cent or more of his salary is presented with an insurance policy for $2,000.

After an employe has maintained the required deposits for a period of five years he may discontinue or withdraw his deposits from the savings fund without in any way affecting the value of his insurance policy.

In order to provide for employes who need money and do not wish to disturb their savings and thus affect their insurance, loans will be made by the company to the extent of 90 per cent of the amount to the credit of the employe in the savings fund.

This plan of insurance is to be made effective at all of the various offices and plants of the Westinghouse company and will affect approximately 50,000 persons.

The Goodyear Industrial University.

By Ralph C. Busbey.

In an effort to more comprehensively and effectively humanize industry, and to further its fundamental principle of preserving the human element by building men and women as well as product, there has just been established in Akron by The Goodyear Tire & Rubber Co., an institution known as Goodyear Industrial University. It is not only the world's first industrial university, but an educational institution without parallel in the wide range of studies embraced in its curriculum, and in the democratic personnel of its student body.

Goodyear University with a faculty of 115, and an enrollment of more than 5,500 men and women, including executives, office employes and manual workers among the company's 35,000 Akron employes, has commodious and fully equipped quarters in Goodyear Hall, the newly dedicated recreational building, said to be one of the finest buildings ever erected by an industrial concern for the welfare and physical and mental developments of its employes.

A GREAT HUMANIZING EFFORT.

The Hall and University were dedicated simultaneously on April 17, when William Oxley Thompson, president of Ohio State University, paid tribute to the broad vision and fundamental principles underlying the motives of the founders of this institution, characterizing its establishment as one of the greatest humanizing efforts known to the industrial world. He predicted that the university would prove a potent factor in stabilizing industry, in allaying industrial unrest, and in bringing about a broader and better understanding between capital and labor and a more harmonious relationship between industrial heads and manual workers.

(The Goodyear Tire & Rubber Co.)

GOODYEAR INDUSTRIAL UNIVERSITY IS FUNDAMENTALLY AN INDUSTRIAL INSTITUTION, TEACHING SUCH BRANCHES OF ACADEMIC AND SCIENTIFIC WORK AS ARE NECESSARY TO THE DEVELOPMENT OF AMERICAN INDUSTRY.

DEDICATED TO GOODYEAR MEN AND WOMEN.

A dedicatory tablet in the hall contains a thoughtful and abiding message that expresses the purpose of the institution. It reads:

> GOODYEAR HALL.
>
> To Goodyear men and Goodyear women, whoever they may be, a great army of people, touching hands around the globe; to education and fellowship; to the forwarding of every right ambition; to the realization for every man and every woman of his usefulness to self, family, company and country; to better understanding between man and man, between management and men; to mutual helpfulness and service; to the fullest loyalty to America and the fulfillment of her promise of moral, intellectual and industrial leadership among the nations; to loyalty and friendship and fair dealing and good will—to these purposes this building is soberly and prayerfully DEDICATED.

DOORS OF LEARNING OPEN TO ALL.

Fundamentally, Goodyear University is an industrial institution teaching such branches of academic and scientific work as are necessary to the development of American industry. Its doors of learning are open to all alike. It is for the lad 16 to 18 years of age, forced out of school to help support a fatherless family. It is for the foreign-born rubber worker anxious to become Americanized. It is for the illiterate, anxious to overcome his handicap and to learn the rudiments of American education. It is for the high school or grade school graduate who could not avail himself of the opportunity of a college education. It is for men and women whose college careers were incompleted and for college graduates anxious to go higher and train themselves along specific scientific lines calculated to fit them best for a further pursuance of their vocation in the great rubber industry. It is for manual workers and factory foremen alike; for office clerks and office executives.

CURRICULUM EMBRACES WIDE RANGE OF STUDY.

There are 600 separate classes which are so conducted as to permit attendance of office employes and to factory workers from all three daily eight-hour shifts. Courses are provided ranging from the fundamentals of rudimentary grade school education to the post-graduate courses in mechanical and chemical engineering and rubber chemistry and rubber technology, the curriculum embracing a wide range of study. There are four distinct divisions, the production school, sales school, school of commerce and school of household arts. A few of the specialized studies are mathematics, mechanical drawing, physics, chemistry, engineering, personnel in business, better letter writing, organization management, corporate organization, finance, business economics and effective stocking. These latter courses are more specifically for executives and office employes aspiring to executive capacity.

Members of the production or flying squadron, men who are either experts or studying to become proficient in factory production matters, are offered a three-year specialized course, upon completion of which diplomas are granted with a degree of Master Rubber Worker. Members of the engineering flying squadron are offered a three-year course in which to qualify for the degree of Graduate Rubber Mechanic.

SPECIAL APPRENTICE CLASSES.

There are special apprentice classes for beginners in factory work where skilled labor is essential. The apprentice machinists' course is for three years, also that for an apprentice draftsman. The former courses are so conducted that young boys may enter the factory and receive a remunerative wage while they are learning. They devote 36 hours a week to shop work and 10 hours to classes, receiving pay for the full 46 hours. Every six months a nominal increase is granted, the amount depending upon each apprentice's ability to grasp details and advance in his machine work. At the end of the three-year course, he is an expert machinist and is eligible for another three-year course in which he can be trained as a foreman or factory mechanical executive.

The special vocational course for foremen and factory executives covers a year of study and class work, while there is also offered an 18 months' course for inspectors. There are at present 1,000 inspectors taking this course and over 2,500 taking the production school course, while 350 shift foremen are specializing in study to fit them for higher executive positions. Stenographic and typist courses are offered also for girls, in addition to those in the school of household arts, including classes in domestic science, housekeeping and sewing.

SPECIAL COURSES FOR MUTES.

One of the interesting courses will be that for instruction in the mute language. Over 700 deaf or silent men and women are employed in factory and office work. They have their own community activities, but are thrown into such constant contact with those not deprived of speech and hearing, that many of the latter desire to learn the silent language in order to converse with them without resorting to the pad and pencil. This course will be for speaking persons. There are also special courses for the mute men and women. The most popular among these for men is the mechanical drawing class. There are, all told, over 300 mutes enrolled in special classes designed for their benefit.

THE DREAM OF VICE-PRESIDENT LITCHFIELD REALIZED.

Perhaps no one man is more directly responsible for the establishment of the university than Paul W. Litchfield, vice-president and factory manager. He long has been the mainspring of all recreational and educational activities, and Goodyear Hall, his dream of several years ago, has finally materialized. Mr. Litchfield is chairman of the Goodyear Board of Education, having direct charge of the university's affairs. Harry Blythe, who is manager of Goodyear Hall and the head of the university, is 30 years of age and a graduate of Mt. Union College, Alliance, Ohio. A. C. Horrocks is head of the factory school, while Coach Ed Connor is head of physical education. Other members of the faculty are: Dr. John A. Custer, who for many years occupied the Chair of History at Lawrence College, Appleton, Wisconsin, and Professor W. A. Emery, formerly of Carnegie Institute of Technology at Pittsburgh. Special language instructors also have been engaged for classes in Spanish, Portuguese, and other languages.

GOODYEAR HALL AFFORDS COMPLETE UNIVERSITY ACCOMMODATIONS.

Goodyear Hall, which contains complete university accommodations, including faculty office suites, 65 large class rooms, lecture and assembly rooms, and several fully equipped laboratories, is complete as to facilities and equipment for mental and physical development, and recreation of the employes.

The auditorium is of the acoustic shell style of architecture, and will seat 1,686 people. The French Renaissance scheme of interior decoration is used throughout, with an indirect lighting system. Two mural paintings adorn the side walls: one of the Bay of Naples with Mt. Vesuvius in the distance, the other a South American scene, picturing natives in the Amazon region loading rubber for export. There are rest rooms for women, smoking rooms for men, and check rooms.

The stage has double aperture, serving, either separately or simultaneously, the auditorium or the gymnasium. It is forty feet wide and thirty-three feet deep with floor laid in sections to permit its removal for installation of swiming tanks, ice skating rinks or other appurtenances for extraordinary acts. A complete counter-weighting system is employed for shifting scenery for either the auditorium or the gymnasium. The gymnasium with balcony and main floor has a seating capacity of more than 5,000. The floor is of sufficient size to permit five games of basket-ball to be played simultaneously. Below the gymnasium are 5,500 locker rooms for men and 54 individual shower baths. For women there are 200 lockers and 18 shower baths in addition to community and lounge rooms and dormitories.

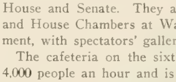
On the third floor of Goodyear Hall are legislative chambers for the industrial legislators of the Goodyear Industrial Republic House and Senate. They are patterned closely after the Senate and House Chambers at Washington in respect to floor arrangement, with spectators' galleries, anterooms and private offices.

The cafeteria on the sixth floor is capable of accommodating 4,000 people an hour and is the largest in Akron and one of the largest in Ohio. Beside the three main entrances to Goodyear Hall, entrance can also be gained through a tunnel leading from the factory building, thus enabling employes to enter the building and avoid inclement weather and street traffic.

As for the university itself, its establishment has been conducive to more harmonious relationship between capital and labor in Akron. The university constitutes a unique experiment and one which is being watched by the entire world. It is proving remarkably successful so far, as indicated by the large enrollment, and should be copied extensively by other industrial concerns in America. Its enrollment is steadily mounting and has increased from 4,000 originally to nearly 6,000, while officials of the university state that they expect an enrollment of nearly 8,000 by July first.

INSPECTED SPARE TIRE LOCKS.

The Underwriters' Laboratories, 207 East Ohio street, Chicago, Illinois, and its branches, maintain a system of inspection at factories and labeling of products which have been examined and tested by the laboratory staff. A list of recently inspected spare tire locks follows:



Underwriters' Label.

"Able.". Able Manufacturing Co., San Francisco, California. Two types: one type consisting of steel loop secured by combination lock, another type consisting of case-hardened steel chain secured by combination lock. Locks spare tire to rear springs or to frame in such a manner that tire and spring or frame are both encircled by device which is held together with a combination lock. Loop or chain is secured to spring or frame to prevent rattling or loss when not in use. Designed for use on all types of automobiles in which it is possible to loop device around frame or spring.

"Bull Dog." The Automatic Equipment Co., submittor, St. Louis, Missouri. Ordinance Tool Manufacturing Co., manufacturers, St. Louis, Missouri. Spare tire lock for use on all automobiles equipped with a tire carrier of the internal rim type, and in which tire carrier is not readily removable.

"Universal." Johnson Automobile Lock Co., Chicago, Illinois. For use on all types of automobiles in which tire carrier is not readily removable.

The best advice that can be given to the owner of a Liberty Bond is this: Hold the bond you bought during the war; it is as safe and sound as the United States Government itself. Buy as many more at the present low rate as you can afford.

Practical Tire Repairing.

By I. B. Zwebell.

The following detailed methods of repairing fabric and cord tires are taken from the practical experience of an expert tire repairman. The instructions for cutting and building as here given will produce the longest tire service if followed. This system saves material because of the fact that a large section of fabric and rubber around the point of injury is not removed. The injury is repaired without removing a great deal of the original material and the new materials are firmly locked in place.

GENERAL INFORMATION.

(1.) Never attempt sectional repairs on tires with tread or fabric loose in many places.

(2.) Be sure of your decision as to the kind of repair to be made before starting to work.

(3.) Determine the length of the injury and the dead fabric if any.

(4.) All tires must be thoroughly dry for good work.

(5.) All dirt and dead material must be removed.

(6.) Aim to eliminate the injury and possibility of friction in the repair.

(7.) It is not necessary to cut away large portions of the tread or step down several plys of fabric to secure a satisfactory repair. Experience teaches that this is not good practice. In stepping down the original fabric the carcass is weakened. It is then necessary to replace the removed fabric with new material. Take the stretch out of the fabric. This requires the skill of a practiced workman, and unless it is carefully done the repair will bulge. When tires are built the fabric is stretched over the core by machinery; therefore, it would be difficult to exercise sufficient strength by hand to take the stretch out of the fabric. New fabric takes longer to cure and a great many repairs leave the shop undercured, causing separation, bulging, and finally a defective repair.

(8.) Skive down the fabric around the hole. This overcomes friction and what is termed a hinge in the repair.

(9.) Round all breaks at the end to stop further breaking.

(10.) Sectional repairs that fall down are usually due to the following:

(a) Not slitting the fabric back far enough. (b) Lack of thorough cure. (c) Hinges at the point of injury caused by neglected skiving. (d) Lack of air-bag pressure. (e) Dirty stock. (f) Insufficient cement or allowing it to become too dry.

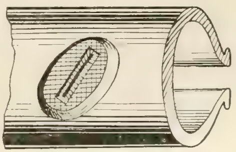


FIG 1. A BLOW-OUT REPAIR.

BUFFING.

Always buff inside and outside of the repair, removing all dirt and dead material, and carry the buffing over the repair slightly to roughen the job so that the cement will adhere easily. If the buffer does not reach all points use a scraper or knife after softening with gasoline.

CEMENTING.

All repairs must be dry before cementing. Three coats are applied, allowing each to dry fully, the time required depending upon weather conditions. Brush the cement over the repair slightly to allow for trimming. Always run or inject cement between loose plys of fabric and hang the tire in a position that will allow the excess cement to drain. Do not use home-made cement in making sectional repairs. Use only first-class material. Cemented tires should not be placed in a draft as the cement will crust over and remain damp underneath. Cement can be dried too long and lose adhesiveness. Stir the cement thoroughly before using.

If you accumulate cushion gum and fabric scrap, cement can be made by mixing one pound of cushion gum with one gallon of high test gasoline. Add 1 ounce of wood alcohol for cutting. The mixture should be well stirred. The use of home-made cement should be confined to cementing or curing boots and inner liners into tires.

BUILDING.

Building stocks should be hung on the wall in a fairly dry place and protected from dust, soapstone, etc. Cut all fabric on the bias and trim the selvages. Lap the fabric when connecting. Have the cement dry before working on the casing. Remove soapstone or oil on the gum by washing with high test gasoline. Do not be alarmed if the repair stock is bloomed, this is merely the free sulphur working to the surface. Remove the bloom with high test gasoline. Handle repair stock with clean hands. Stretch all fabric when applying to the job. Roll and stitch the repair thoroughly before trimming. Perforate all repairs with air vents before curing. Do not use a spliced ply of fabric directly over the injury or over the bead. Trim all edges and splices down before curing. Always fill holes with cushion gum. It is advisable to use a ply of 1/32-inch cushion gum between the band ply and the reclaimed shoe. Endeavor to keep unevenness out of the repair as it usually hinges and breaks. If the gum sticks to the holland liner, wet the opposite side with gasoline.

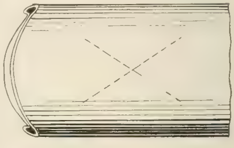


FIG. 2. CUT INSIDE FABRIC PLY DIAGONALLY.

REPAIRING A SMALL BLOW-OUT.

Any repairman or individual contemplating going into the tire repair business can make successful repairs by following these directions and by a little common sense. The following instructions are for repairing an ordinary blow-out when the injury does not extend over 3 inches in length:

(1.) Place the tire on a building mandrel, and cut away all loose and uneven particles of rubber, starting and slanting the cut 45 degrees to give more uniting surface. Cut through the breaker.

(2.) Skive down two or three plys of fabric at the point of injury. This depends upon the size and number of plys of fabric in the tire.

(3.) Buff the outside of the repair. Extend the buffing slightly over the repair and roughen the tread edges so that the cement will adhere.

The above instructions can be easily followed by referring to Fig. 1.

(4.) The next step is to turn the tire. If it is a soft bead clincher it can be turned by the workman over his knee. If it has cable base beads use a tire spreader.

(5.) While the tire is in this turned position, buff the inside of the repair from 6 to 10 inches from the center of the injury. This will depend upon the length of the injury and length of reclaimed fabric shoe to be used.

(6.) Cut the inside or band ply of fabric diagonally as indicated by dotted lines in Figure 2. The length of the cut will depend upon the extent of the injury, advisedly 2 inches beyond the end of the injury and not more than 3 inches. This opera-

tion should be accomplished with a small hook or notched knife.

(7.) Pry the fabric loose with a blunt screw-driver or prodding tool, laying the four wings or ends back as indicated in Fig. 3.

(8.) If the injury is fresh and the fabric clean and sound no further buffing is required as the cement will adhere to the clean cured friction between the plys. Further buffing is necessary only when the fabric has been water logged or is dirty. If the inner plys are water logged, rotted, or exceptionally dirty, one or more plys can be removed, but must be replaced as described in operation 14. Always aim to preserve the inside or band ply as this is the locking ply and holds the repair together.

(9.) Repeat operation 2. Skive down to one ply of fabric in order to remove the stiff joint or hinge.

CEMENTING.

(10.) Three coats are applied, allowing each coat to dry thoroughly. The time required depends upon weather conditions. Cemented tires should not be placed in a draft as the cement will crust over and remain damp underneath. Cement should not be allowed to dry too long or it will loose its adhesiveness. Hang the tire in a clean, dry place, the repaired section on top so that all excess cement can drain.

(11.) Select the proper size reclaimed fabric 3-ply shoe. Cement this at the same time and place with the tire to dry.

BUILDING.

(12.) Place the tire in a building rack or stand and spread the beads apart with bead spreaders. Bring the edges of the injured portion together. The cement being tacky, these edges will immediately unite. Cut a small strip of cushion gum and stitch it in the crevice caused by skiving the edges of the injury. Then fit a new piece of building fabric in the section, taking care to make a good fit. This can be easily accomplished by making a pattern or templet of holland liner as it will not stick to the freshly cemented fabric. After the correct size has been determined, cut a piece of building fabric the exact size of the pattern and stitch this into place, trimming any excess fabric with a hook or notched knife.

(13.) Close up the injury and lock the new fabric in place by bringing the tips of the four wings back to their original position. Stitch them down carefully, starting at the outside and working toward the center. Now cover the edges with strips of cushion gum as indicated by dotted lines in Figure 2.

(14.) If one or more plys have been removed as indicated in operation 8, replace them with a new ply of fabric. This ply should extend at least 1 inch beyond the extreme outside of the dotted lines in Fig. 2. In the event that it is not necessary to remove a ply, lay the 3-ply reclaimed skived shoe in place, centering it well and stitching it down thoroughly from the center out. Dust the inside with soapstone and remove the bead spreaders.

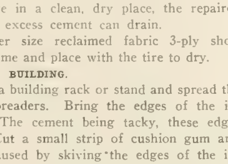


Fig. 3. Lay Four Ends Back.

(15.) Place the tire on the building mandrel.

(16.) Roll down the edges of the injured portion of the tire which have been previously been brought together in operation 12.

(17.) Fill in all low spots and crevices caused by skiving, with cushion gum, stitching thoroughly.

(18.) Cover the cemented section with a layer of 1/32-inch cushion gum.

(19.) Fill in the portion cut away with tread stock, and stitch thoroughly, perforating the new gum with a pricking awl or porcupine roller.

(20.) Trim down the new gum flush with the tire.

(21.) It is advisable and will result in neater work if the repaired section is buffed lightly with a wire brush or emery wheel. The new gum should be buffed from the center out. Care should be taken not to exercise too much pressure.

(22.) Cure.

REPAIRING A LARGE BLOW-OUT.

When the injury extends over three inches in length, it is usually necessary to lay back the tread.

(1.) Be sure of your decision as to the kind of repair to be made before starting the work.

(2.) Locate the injury and cut away all loose particles of tread. Some repairmen start their splice in the center of the repair and lay back the tread both ways. This method is optional, although the writer believes the single lay-back is more practical as it leaves one end free to work over, and also carries the splice away from the hole as this is filled up with gum and is, therefore, yielding, giving movement to the splice with a tendency to loosen up. Where the break is across the tread completely, make a double lay-back.

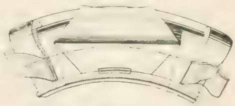


Fig. 4. Lay Back Side Walls.

(3.) When you have located the place for the splice, cut across the tire, slanting the cut 45 degrees to give more uniting surface. Cut through the breaker.

(4.) On non-skid tires, cut the splice on the highest point as this will give better pressure in the mold when cured.

(5.) Cut under the sides of the tread on both sides with a large notch knife, to the first ply of fabric, one to three inches beyond the end of the break, then peel the tread back, cutting it away from the carcass with a tread knife as you go.

(6.) Strip the side walls down about one inch from the end of the lay-back on both sides and remove or lay back the side walls if in good condition. Figure 4 illustrates the side walls laid back.

(7.) In most cases the bead cover is about one inch above the bead, which is cut over the bead with a hooked nose knife, and removed. Should the tire not have a bead cover, trim the side wall off and treat it as though it was there. The new ply of fabric takes the position of the bead cover when removed.

(8.) Repeat operation 2 under "Repairing a Small Blow-Out."

(9.) Now buff the outside of the tire including the bead, as previously described. The lay-back tread or side wall can be held out of the way by tying them back, or by a series of fish hooks. If fish hooks are used, grind off the barb and attach the pair together at the ends.

(10.) Refer to operation 6 under "Repairing a Small Blow-Out." Instead of cutting the band ply, cut diagonally across the outside ply of fabric. If the injury is of long duration, the outside ply may be rotten. In that event, remove it altogether and perform operation 6 on the second ply.

(11.) Repeat operations 4, 5, 6, 7, 8, and 9 under "Repairing a Small Blow-Out."

BUILDING.

12. Repeat operations 12, 13, 14, 15, 16 and 17 under "Repairing a Small Blow-Out."

In repeating operation 12, if one ply of fabric has been removed, it is advisable to replace this with a new ply placed over the whole repair, ending at the toe of the bead, and extending at least one inch beyond the ends of the diagonal cut shown in Fig. 2.

(13.) Cut a ply of 1/32-inch cushion gum long enough to build up on the lay-back and come down to the heel of the bead.

Stretch and roll the cushion gum thoroughly.

(14.) Cut two strips of side wall gum to match color when cured, and apply on the side of the side wall, starting just over the bead, bringing it out about the tread line and trim smooth.

(15.) Now wash the whole surface where the tread comes down with high-test gasoline to remove dirt, etc.

(16.) Back up the hole in the tread with cushion gum and pull the tread down to fit snugly in place. Be sure to have a strip of cushion between the splice.

(17.) Fill in the hole in the tread, also around the splice and where the tread meets the side wall.

(18.) Stitch, roll and perforate the whole repair well for air vents and trim down smooth. All lay-back sections should be run through a bench tread roller which thoroughly unites the fabric and rubber.

(19.) Cure.

REPAIRING A RIM CUT.

Referring to Figs. 4 and 5, a side section or rim cut repair differs in a lay-back section in that only one side wall is removed and the tread is laid back only when the injury extends four or more inches in total length.

Do not repair a rim cut unless it is an accident. Avoid repairing a tire run under-inflated for the chances are it is weak in other places and will soon blow out at some other point beyond repair. Rim cuts caused by obstacles, curbs, defective rims, etc., can be successfully repaired.

(1.) Locate the injury.

(2.) Remove or lay back the side wall two or three inches beyond the end of the injury. If it is at the heel of the bead, it is not necessary to disturb the tread in most cases. If the injury is above the heel, a portion should be removed as indicated in Fig. 4, or laid back as previously described. In any event, cut away the side wall or tread on a 45-degree angle to allow more surface for uniting again.

(3.) Remove bead strips.

(4.) Skive edges of injury.

(5.) Buff removed portion, carrying the buffing well over the repair and bead.

(6.) The next step is very important, and that is locking the repair in place.

(7.) Cut the fabric horizontally along the heel of the bead about one inch beyond the injury, then slit the fabric on about a 60-degree angle toward the tread at either end of the injury. See heavy line in Fig. 4.

(8.) Pry the fabric loose and turn it back as indicated in Fig. 4.

FIG. 5. A RIM-CUT REPAIR.

(9.) The cutting down from the outside being completed, now turn and buff the tire as previously described. Skive the injury, lift the band ply in the same manner as in operation 7. Now refer to and note operation 8. Cement, select skive shoe, etc.

(10.) Close up the injury with cushion stock as described in operation 8.

(11.) Make a pattern of holland cloth that will extend from under the laid-back inside ply to the laid-back outside ply of fabric. When the pattern has been properly fitted, cut the fabric according to the pattern and stitch in place, being careful to stretch the fabric to avoid a bulge after the tire is put in service. Start building up on the inside and be sure the new fabric is as wide as the widest part of the lay-back.

(12.) Stitch down the fabric lay-back or wing.

13.) Insert a three-ply reclaimed shoe, making sure three plies come flush with the toe of the bead.

(14.) Trim off the portion of the shoe extending over the toe of the bead.

(15.) Finish building up the side wall as heretofore described in detail.

CURING SCALE.

The following scale shows the steam pressure and equivalent degrees in F.

Steam Pressure. Pounds.	Degrees F.	Steam Pressure. Pounds.	Degrees F.
35	280.6	55	302.6
40	286.7	60	307.3
45	292.4	65	311.8
50	298.7		

The time of cure will fluctuate by difference in heat. Aim to work at 50 to 55 pounds pressure.

The above is approximately correct when circulation is entirely open, and represents degrees F. of the steam line, and not at the mold.

The time of cure of the different repairs is in many cases optional with the repair steam man, due to the many makes of vulcanizing plants on the markets and also to the kinds of materials used. It is always advisable for the steam man to take test cures and arrive at curing scales for himself. In fact this is simple, as the different jobs as they come out can be tested with a pencil point and if the impression remains and does not come back to place, a slight amount more of curing will remedy it. Should it be hard or brittle, decrease the cure.

CURING SCALE FOR FABRIC AND CORD FABRIC SECTIONAL REPAIRS.

The following scales have been developed at a large plant using controlled steam at 50 to 55 pounds pressure on standard equipment and can be safely used with the best of results, in any plant with this amount of steam, a slight variation being made to suit the plant in use.

Size. Inches.	Fabric. Minutes.	Cord Fabric. Minutes.	Size. Inches.	Fabric. Minutes.	Cord Fabric. Minutes.
3	45	50	4½	60	70
3½	50	60	5	60	70
4	55	65	5½	65	75

When using an impression pad add 10 to 15 minutes. Cure a fabric tire on the arm about one hour; cord tire, one hour and fifteen minutes.

Cure gray tubes for hole repairs 15 to 20 minutes at 50 pounds. Cure red tubes slightly less than gray tubes. Splices and valve pads take about the same time.

HANDLING HOT CEMENT CLINKER BY RUBBER CONVEYOR BELTING.

An unusual problem in handling hot cement clinkers with a temperature of 200 degrees and over was recently solved at the plant of the Standard Portland Cement Co., Leeds, Alabama, by using a rubber conveyor belt. The clinker, however, could not be cooled sufficiently to prevent scorching of the belt and its rapid destruction. The answer was found by running the belt at an incline of 12 degrees, so that the lower pulley dipped into a trough of water, thus carrying a film of cold water upon the belt, on which the hot clinker from the loading hopper was deposited.

The conveyor was made endless by the use of metal belt fasteners which brought the belt ends tightly together, preventing the clinker ash from getting into the joint and abrading the belt ends. Moreover, in this method of joining no metal came in contact with the pulleys to cause wear and a permanent joint was thus assured.

In six months of operation, this conveyor carried 61,000 tons of clinker and credited saving in belt cost alone to this conveyor is $300. The belt used was made particularly to withstand temperatures to 200 degrees. ("Chemical and Metallurgical Engineering," March 24, 1920.)

Interesting Letters from Our Readers.

FURTHER STUDY FOR NATIVE RUBBER PLANTS.

To the Editor:

Dear Sir: The finding of approximately 300,000,000 pounds of rubber in native American plants does not remove the need of further studies, since some of this supply is unavailable except at great expense and the total would not suffice in a long-drawn-out war.

The possibility of bringing the plants into cultivation on a commercial scale even in times of peace should, it seems to me, be further investigated. Such investigations should include the search for better varieties or strains of *Chrysothamnus nauseosus* than we have yet found. Only 12 of the 22 named varieties have been examined. Breeding and selection should also be begun, starting with the best available sorts. Also experiments in changing the cultural conditions in order to increase the deposition of rubber. The pruning experiments, to increase the weight of the rubber-bearing portions and possibly the percentage content are not being continued this year because of the difficulty of getting out to the tract at Benton. This is a promising line of attack.

My interests in the matter are just two, namely, the desire to see the results of our scientific work turned to some practical account, and second, the much broader desire to see our country protected from a possible shortage in this important commodity in time of war. For these reasons I wish that *Chrysothamnus* might soon be given the same attention that has been accorded to guayule or, better yet, that a thoroughgoing investigation be made of all possibilities in the nature of rubber plants suitable for cultivation in America, including guayule, *Chrysothamnus, Haplopappus,* a long list of exotics, and certain native latex plants which we now have under examination and some of which are exceedingly promising.

Several of our leading government botanists and plant breeders are much interested in these matters and are very encouraging as to the possibilities of *Chrysothamnus* culture, but they can do nothing on an extensive scale unless there is a general public demand for it. Our American people as a whole are very slow to protect themselves against remote dangers, and since our government workers can get support only when there is some political interest to be served, it remains, it seems to me, for some man or group of men with long vision and strong patriotic impulses to take the initiative in the matter.

Any suggestions which you may care to make or any criticism of our work will be most thankfully received, even though our active studies in *Chrysothamnus* have ceased, at least for a time. We always appreciate the opinions of those who are familiar with the more practical aspects of the situation.

H. M. Hall.

Berkeley, California, May, 1920.

STEVENS' SULPHUR DETERMINATION METHOD.

To the Editor:

Dear Sir:—In your issue of March 1, you reprint a paper by Messrs. Kratz, Flower and Coolidge entitled, "A Rapid Method for the Determination of Sulphur in Rubber Mixtures." These authors have been good enough to refer to the method in use in my laboratory for this purpose (see "Analyst," Vol. XLIII, 1918, page 377). I do not lay claim to originality in the use of magnesium nitrate in the place of the ordinary sodium carbonate-potassium nitrate mixture, as magnesium nitrate was recommended some years ago for this purpose (see, for instance, Caspari, "India Rubber, Laboratory Practice"), although its advantages do not appear to have been fully recognized. The only modification I lay claim to is the use of a Kjeldahl flask for the wet oxidation. By fitting this with a single surface condenser in the neck, the contents of the flask may be boiled for some hours without appreciable loss of acid. I do not think the process of transferring the contents to a dish for evaporation and "baking" is an operation likely to involve much trouble or loss, and my process has the advantage of avoiding the use of bromine. This is of importance, because bromine is frequently contaminated with sulphur compounds, whereas the ingredients I use, namely, nitric acid, potassium chlorate and magnesium nitrate, are all obtainable free from sulphur compounds, so that blanks give practically negative results. For those who may not have a copy of "The Analyst" handy I give below an account of the method I employ for carrying out the determination.

About 0.5-gram of the sample is digested with 20 cubic centimeters of nitric acid (specific gravity 1.42), to which about 0.5-gram of potassium chlorate is added. If the sample is finely divided, the initial reaction is violent, and the flask (a Kjeldahl flask is suitable) should be cooled in water. The flask is fitted with a small surface condenser, and the liquid boiled for two or three hours, then evaporated to dryness in a basin, with the addition of 3 grams of pure magnesium nitrate. The heat must be moderated at the last stages to avoid spitting, and finally it is cautiously heated over a naked flame. The slow combustion which takes place owing to the presence of the magnesium salt is quite under control. There is no need to carry the heating farther, and ten or twenty operations can be carried out with the same dish. If an appreciable amount of unburnt carbon remains, it is best destroyed by digesting the nitric acid and a little chlorate, and the excess of acid removed by evaporation. Ten cubic centimeters of concentrated hydrochloric acid are then added, and the dish covered with a clock-glass, and gently heated for an hour or two until red fumes cease to be given off. The liquid is then diluted, filtered, and made up to 300 cubic centimeters, heated to boiling on a hot plate, and precipitated by very gradually adding 5 cubic centimeters of a 10 per cent solution of barium chloride. The whole is allowed to stand over night, and the barium sulphate estimated on the following day in the usual manner.

Numerous duplicate analyses give concordant results, and also agree with estimations made by heating the sample with nitric acid in a sealed tube.

One assistant can easily average 6 sulphur determinations a day by this method.

Henry P. Stevens.

15 Borough High Street, London Bridge, S. E. 1.

THE RUBBER SITUATION IN THE PHILIPPINES.

To the Editor:

Dear Sir: Many years in the Philippines and a knowledge of the situation there prompts me to summarize the conditions affecting rubber planting.

(A) There are certain tropical agricultural commodities or industries that cannot be developed by a poor man (all Filipinos) without lots of capital, because of the many years' wait for any returns. Chief among these is rubber where catch crops are not practical as in cocoanut production.

(B) The present land and labor laws were formulated by Americans, not by the Filipinos, and cannot be changed without Filipino legislative action approved by the President of the United States. All Filipino action has been consistently blocked by our State Department.

(C) Progressive Filipino planters realized these initial law handicaps years ago, and it is a matter of record that in 1917

the Filipino Agricultural Congress—a semi-official body—came out squarely for a change in the existing immigration laws to permit entrance of labor from outside, but the American power then in control did not help them.

(D) The government changes since the Jones Law went into effect are many:

(1) Philippine Assembly equals our Congress.
Philippine Senate equals our Senate.
Philippine Cabinet equals our Cabinet.
Philippine Council of State equals our Cabinet plus Speakers of both houses with the President presiding.

(2) National budget covering all appropriations based on the English system.

(3) Municipal and government ownership which is efficient and yields profits instead of adding taxes to the people.

(4) A national development company ($25,000,000 capitalization) with 51 per cent of stock government, and 49 per cent public, administered by business men, to develop the latent resources of the Islands by subsidiary companies.

(5) They have a Philippine commercial agency in the States with offices now in San Francisco and New York. I understand J. J. Rafferty has just been named Philippine Trade Commissioner for the United States. (It is on this that you can make a hit that should count—that unless the Philippine officials can change their laws to permit rubber development on a business basis [large leased land areas and cheaper and plentiful imported labor]—they had better stop trying to interest rubber investment altogether. This may get action.)

(E) The patriotism of the Filipino people in organizing a division for use at the front, their efficient government organization from a practical operating view-point, their foresighted public works development, their appreciation of the work done by Americans in giving a gratuity (above all contractual obligations) to Americans who have served faithfully and well, are the creditable things that may be referred to—the sugar for the beginning and the ending of your article.

Faithfully,

Manila, P. I., 1920. C. F. H.

OF PIONEER STOCK.

To the Editor:

Dear Sir: To introduce my sister and myself, allow me to mention that our father, L. Otto P. Meyer, a naturalized American, was well known in the rubber world. In former years you sometimes bought short articles about his inventions, as in No. 5 of your paper of the year 1894, February 15, page 133.

Our father died at the age of 88 years. Although his patents, the employment of tin-foil and tin molds, as also the improved process of the water-hardening, afforded the American manufacturer the only effective protection for 21 years, and even to-day form the basis for the manufacture of vulcanite, he died in very poor circumstances, leaving a widow in delicate health, who also died a few years ago, and we, his two maiden daughters, both artists (lady painters). Our father told us shortly before his death, "If ever in life you should need the help of a friend, I am sure that among my American rubber friends there will be some one who will aid you." I am not aware who of my father's friends or acquaintances are still alive; I therefore address these lines to you.

We are both born Americans, painters by vocation, and, although we have lived here many years, we are generally treated by the Germans as foreigners, which makes it more difficult for us to earn money. We therefore would be happy if we could sell some pictures in America. We have at hand originals and good copies of the Dresden Gallery. As the German money stands very low, it would be for American purchasers a good bargain.

Please excuse my troubling you, but the terrible times we have gone through have induced us to apply across the ocean for help and we would be very happy if we could receive an order from you.

Yours respectfully,

Ostbahn Strasse, 8, III, Eda Meyer.
Dresden, April 4, 1920.

WHY NOT AMERICAN RUBBER FACTORIES IN MALAYSIA?

To the Editor:

Dear Sir:—With America importing thousands of tons of rubber a year—one company alone is using 35,000 tons—it would seem worth while for more American rubber manufacturers to built plants in eastern countries. The principal sources of supply are Singapore and Malaysia and in order to furnish the needs of the United States, vast industries have grown up in these countries. What was formerly a mere jungle is to-day a busy center of industry. The distance between the source of supply and the American manufacturer is so great that much time and money is lost in the process of transportation. Cheap coolie labor in China is another factor which would enable the American manufacturer to turn out rubber goods at a much lower price were the rubber grown on American plantations in the Orient.

Representatives of the Interchurch World Movement who are making an economic survey of the East report that native Chinese are making fortunes in Malaysia, through the demand of the United States for the raw material. Sons of coolies, who went to the Straits a generation ago to work on the plantations are to-day owners of rich holdings and the chief business men of the place. The English Government offered five acres each to coolies who would agree to cultivate the jungles. In consequent great centers of civilization have sprung up where formerly only wild animals were to be found. The rubber plantation yields a big profit for the energy expended upon it.

Interchurch World Movement of North America,
45 West 18th street, New York City.

AS TO RUBBER HEEL PATENTS.

To the Editor:

Dear Sir: Are there any patents covering the use of a concave surface for the portion of a rubber heel that attaches to the shoe? If so, will you be good enough to cite them for me?

Los Angeles, March 10, 1920. P. A. McAviny.

Heel patents in general run into thousands. To scan them all would be something of a task. Of course there are the Trufford patents that are suggested by your question. Then, too, as far back as 1897 the idea of recessed heels was indulged. Witness the pneumatic heel brought out by Anderson of Boston. There was also the Spider-grip heel, made with a rand so it could be attached directly to the heel-seat by a heeling machine. There was, furthermore, the Ferguson heel that, to quote the printed description, had "a sort of hollow or air-chamber next to the shoe which causes the rubber heel to adhere to the leather, on the same principle of suction which enables a fly to keep its footing on a ceiling or wall.

You might look up the following also:

1896.	Anderson	No 582,336	1900	Herbst	No. 658,441
1897.	Warner	594,108	1902.	Hilton	736,394
1897.	Hanline	615,167	1904.	Hammer	817,355
1898.	Morrow	623,803	1906.	Kearney	866,867
1899.	Morrow	630,726	1906.	Anderson	869,764
1899.	Ferguson	638,228	1907.	Leighton	906,807

There are many others, as this is by no means an attempt at a complete list. The Editor.

What the Rubber Chemists Are Doing.

CARBON BLACK.[1]

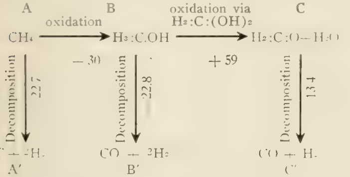
METHOD OF MANUFACTURE.

Carbon black, as known to the American trade, is the fluffy, velvety black pigment produced by burning natural gas with a smoky flame against a metal surface. It is entirely different in physical characteristics from lampblack, which is made by burning oil or other carbonaceous material with insufficient air for complete combustion and collecting the smoke in settling chambers. Lampblack is gray in contrast to the deep black of carbon black, and often contains considerable quantities of empyreumatic matter.

The process of manufacture used to the greatest extent at the present time is the so-called channel system, in which the black is deposited on the smooth under-surface of steel channels by lava-tip burners set at a distance of three or four inches below the channel. The channel irons are usually built up in tables of eight, sometimes 100 feet long, and are given a slow reciprocating motion which scrapes the black deposited on them into hoppers from which it is carried by screw conveyors to the packing house, where it is bolted and sacked. The mechanism is enclosed in sheet-iron buildings in order that the amount of air may be regulated. Varying the amount of air, speed of scraping, and pressure of the gas controls the quality of the product. The shape of the burner and distance from the collecting surface also affects the quality of the black, but these are constant for any one plant. Other similar processes differ only in the nature of the collecting surface and burners.

THEORY OF FORMATION OF CARBON BLACK.

When natural gas burns in an incomplete supply of air, the carbon is liberated, not as a result of preferential combustion of hydrogen, but as a direct decomposition of unburned gas in the heat of the flame. According to Bone[2] and co-workers, combustion takes place in steps as a result of hydroxylation:



It is evident that the tendency is always to run from A to C. When the proportion of methane to oxygen is CH_4: O_2 the reaction goes from A to B to C to C′. If the ratio is 2 CH_4: O_2 or higher, only a part of the methane can be oxidized through the reaction A to C and part is decomposed at A by the heat evolved in the A to C reaction. The lowest per cent of oxygen in which a methane flame will burn is 15.6 per cent. Carbon will be evolved only in the inner part of the flame, where the oxygen supply is low but where there is sufficient heat to break up the methane, and the per cent of carbon to be expected by the incomplete combustion of methane is low. Gases rich in ethane and the higher homologs produce greater yields by this process.

The function of the cold surface is to cool the liberated carbon in the flame sufficiently to prevent its combustion. This permits the use of a sufficiently hot flame to give carbon uncontaminated with hydrocarbons or their partial oxidation products and produces a finely divided material which has been prevented from agglomerating by the sudden cooling. It is evident that there must be an optimum temperature and an optimum position for the surface in the flame. Too cold a surface may prevent the maximum separation of carbon; too hot a surface will allow too much carbon to be burned and may change the properties of the carbon which remains unburned. The temperature of the channels in the present processes is about 300 degrees C.

USES OF CARBON BLACK.

In order of importance the uses of carbon black are as follows:

1—Printers' ink.
2—Automobile tires and other rubber goods.
3—Black and gray paint and enamel.
4—Stove polish.
5—Other products—such as phonograph records, carbon paper, crayons, typewriter ribbons, black and gray paper, glazed paper, tarpaulins, black leather, bookbinders' board, marking and stenciling inks, rubber sheeting and clothing, hard rubber, artificial stone and black tile, Chinese and India inks, fireworks, insulating materials, crucible steel, case hardening.

The amounts used by these industries in 1918 were approximately as follows:

	Pounds.
Printers' ink	10,000,000–12,000,000
Rubber goods	20,000,000–
Stove polish	4,000,000– 5,000,000
All others	1,000,000–

Besides this, in normal times probably 15,000,000 pounds are exported.

RUBBER TIRES.

Prior to 1914 little carbon black was used by the rubber industry and then only in small amounts as a coloring material. Little distinction was made between carbon black and lampblack, the two compounds being used indiscriminately. At this time, due partly to the stimulus afforded by the rising price of zinc oxide, it was found that carbon black could be used in very large amounts as a filler for rubber, with a correspondingly smaller amount of zinc oxide. Carbon black is used in rubber in quantities of 3 per cent to 20 per cent by weight. Many manufacturers claim very unusual properties for rubber so compounded. It is said to increase the tensile strength very greatly and to give increased toughness and resistance to abrasion. It is believed by some authorities that the life of the rubber is increased. Other rubber chemists are more conservative in their praises of carbon black and do not admit that it possesses any properties which make it irreplaceable.

From the point of view of cost, carbon black is much cheaper than zinc oxide. Carbon black, absolute specific gravity 1.8, suitable for compounding in rubber, can be procured for as low as 10 cents a pound at the present time. Zinc oxide costs at least as much and has a specific gravity of 5.8. Carbon black evidently costs one-third as much as zinc oxide on a volume basis, supposing that equal volumes were compounded with the rubber, but in practice a greater volume of carbon black is used than of zinc oxide so that the resulting mix with carbon black contains less rubber per unit volume than the corresponding zinc oxide mix.

From a theoretical consideration, carbon black should be an ideal filler for rubber on account of its extremely fine state of division and the correspondingly large surface energy developed when intimately mixed with the rubber. It also serves to

[1] "Carbon Black, Its Properties and Uses." By G. St. J. Perrott and Reinhardt Thiessen, Chemical Research Laboratory, Bureau of Mines Experimentation, Pittsburgh, Pennsylvania. Presented at the meeting of the American Chemical Society, Philadelphia Pennsylvania, September 2 to 6, 1919. Published by courtesy of the American Chemical Society.

[2] Transactions of the Royal Society, London, 215 (1915), 275.

protect the rubber substance from the effects of light and may possibly retard oxidation.

Whatever may be the true state of affairs as to the irreplaceability of carbon black in rubber, an enormous amount is now consumed by the rubber companies, probably 20,000,000 pounds annually, and 10,000,000 pounds exported for foreign trade in normal times.

TESTING METHODS.

The final test of the suitability of a black for a given purpose is the actual trying out of the working qualities. In rubber making a sample mix is made and the finished piece tested for tensile strength, per cent elongation, toughness, and resistance to abrasion.

There are, however, a number of laboratory tests which are of use in matching a standard sample. The tests most commonly employed are for tinting strength, color, and grit. It is also desirable to determine moisture, ash, and acetone extract.

TINTING STRENGTH.

According to the American Society for Testing Materials, tinting strength is "the power of coloring a given quantity of paint or pigment selected as a medium or standard for estimating such power." Tinting strength, then, as applied to carbon blacks is the measure of the ability of the black to impart a color to a definite weight of standard white. It depends on the size of the particles and the specific gravity of the black. In making the test, the black is always compared with a standard black.

Weigh out accurately an a sensitive balance, 0.100-gram of the black to be tested and 10.0 grams of a standard zinc white kept especially for the purpose. Transfer to a glass or marble slab and add from a burette exactly 3.5 cc. refined linseed oil. Mix with a palette knife and rub out thoroughly with the palette knife (or, better, a glass muller) until no streakiness or difference of color is observed, when successive small portions are spread out on a clean piece of window glass and viewed from the upper side. It is important that the rubbing out be thorough; 10 minutes are usually sufficient. Follow the same procedure with the standard black. Then spread a small amount of each mix side by side on a clean glass (a microscope object glass serves the purpose very nicely). Examination of the samples from the other side of the glass, particularly at the line where they overlap, will show the difference in tinting strength.

To make a quantitative estimation of the tinting strength of the sample as compared to the standard, more white is added to the stronger mix until the colors match. A new sample of the stronger black is then weighed out, using the calculated amount of zinc white, and the process repeated until mixes of the same color are obtained. If, for example, it was necessary to mix 15 grams of zinc white with 0.1-gram of the standard to match a mixture of 10 grams zinc white and 0.1-gram of the sample, the latter has two-thirds the strength of the standard.

COLOR.

By this term is meant the relative blackness of the material when mixed in oil.

To 0.3 gram of each of the blacks to be compared add 1.3 cc. of refined linseed oil from a burette. Mix thoroughly with the palette knife and spread side by side on a slip of glass and compare the relative color by viewing from the upper side of the glass.

GRIT.

Presence of gritty matter is determined by rubbing a portion of the black under the finger or by placing a small amount on the tongue and rubbing between the tongue and palate.

CHEMICAL TESTS.

It is occasionally desirable to make a few quantitative chemical tests of carbon black. A black containing more than 0.2 per cent ash is probably adulterated with mineral black or charcoal. An acetone extract over 0.1 per cent indicates adulteration with a poorly calcined lampblack. Too great a percentage of moisture is undesirable from the point of view of working qualities. Certain blacks will absorb as much as 15 per cent of their weight of moisture, making a total moisture content of 20 per cent or more. More blacks for ink making contain from 2 to 4 per cent of moisture, although certain blacks may contain as high as 7 per cent.

MOISTURE.[3] A 1-gram sample of the black is placed in a weighed porcelain crucible and heated for one hour at 105 degrees C. in a constant temperature oven in circulating dry air. The crucible is then removed from the oven, covered, and cooled in a desiccator over sulphuric acid. The loss in weight multiplied by 100 is recorded as the percentage of moisture.

ASH.[3] The crucible containing the residue from the moisture determination is heated gradually with a Meker burner (for better, in a muffle furnace) to cherry-red (about 750 degrees C.). Ignition is continued until all the particles of carbon have disappeared. The crucible is then cooled in a desiccator and weighed, after which it is heated again for 15 minutes, cooled in a desiccator, and reweighed. If the change in weight is more than 0.0002-gram, the process is repeated until successive weighings are constant to this figure. The weight of the crucible and ash minus the weight of the crucible is taken as the weight of the ash.

ACETONE EXTRACT. A 2-gram sample is weighed into an alundum or paper extraction thimble of 20 cc. capacity and the extraction carried out for one hour, using any standard apparatus of the Soxhlet type. The weight of the residue after evaporation of the acetone is taken as the acetone extract. The extract for a pure carbon black is usually zero.

SPECIFICATIONS.

The Bureau has received a great many inquiries in regard to tests which a carbon black must meet to be suitable for use in printing ink or rubber.

The following specification represents the requirements for the rubber trade. It should be realized that there are no hard and fast specifications for carbon black, and that the test on which a black stands or falls is the practical test.

CARBON BLACK FOR RUBBER COMPOUNDING.

CHEMICAL TESTS.

Moisture—Less than 4 per cent.
Acetone Extract—Less than 0.5 per cent.
Ash—Less than 0.25 per cent.

PHYSICAL TESTS.

Grit—None.
Tinting Strength—Not less than 90 per cent of the strength of standard.

PRACTICAL TESTS.

Rubber mixes are made up containing equal weight of the sample to be tested and of the standard. Mixes are cured under exactly the same conditions. The finished sheet is tested for tensile strength, per cent elongation, toughness, and resistance to abrasion.

CHEMICAL ANALYSIS.

Carbon blacks consist of from 85 per cent to 95 per cent amorphous carbon, 1 per cent to 7 per cent water, 0.5 per cent to 0.8 per cent hydrogen, and from 2 per cent to 8 per cent oxygen, present partly as CO and CO_2, and partly as fixed oxygen.

[3] For details of method, see F. M. Stanton and A. C. Fieldner, "Methods for Analyzing Coal and Coke," Bureau of Mines, Technical Paper 8.

BENZOL POISONING.

Benzol or benzene is one of the most important industrial poisons. Poisoning due to benzene may occur in the manufacture of aromatic hydrocarbons, or in the technical use of products containing these hydrocarbons, for example, in the removal of grease from goods, and in the manufacture of varnish and rubber. The poisoning may be mild or severe, acute or chronic, and may have fatal results. When man is exposed to a mixture of benzene and air, he absorbs 80 per cent of the ben-

zene; the limit for animals is from 0.015 to 0.016-part of benzene to 1,000 parts of air. Distillations should be carried out in impervious apparatus with well-cooled condensers. All apparatus which has contained benzene should never be entered for cleaning or repairs until all benzene has been removed, and thorough ventilation has occurred. The workmen should have approved breathing apparatus. A person overcome by benzene should be removed into fresh air promptly, and given artificial respiration. Women are more susceptible than men to benzene poisoning. (R. P. Albaugh, "Modern Medicine," 1919, volume 1, page 670.)

CHEMICAL PATENTS.

THE UNITED STATES.

Leather Substitute, comprising rubber and wax of the montan class. The composition has the tough slow-flexing qualities of leather and is devoid of the springy, elastic qualities of rubber. (John D. Prince, Boston, Massachusetts. United States patent No. 1,336,858.)

Dressing for Leather, etc. A quick drying dressing for leather and the like, consisting of the following ingredients in the proportions stated: asphaltum, 1 gallon; benzine, 1 gallon; rubber cement, 1 quart; black pigment, 1 pound; Japan drier, 1 pint; beeswax, ¼ pound. (Alfred R. Caldwell, Pasadena, California. United States patent No. 1,338,286.)

THE UNITED KINGDOM.

Electric Cable Composition.—For a protective and insulating covering, rigid when cold, but readily pliable when warmed, which permits the cable to be laid against irregular surfaces by heating it at the necessary parts. It comprises rubber combined with a large proportion of sulphur to which may also be added asbestos, shellac, gutta percha, balata, silica, magnesia, chalk, zinc oxide and the sulphates of antimony. When applied to the cable the composition is vulcanized to produce a covering of the nature of ebonite. The following percentage proportions are given: rubber 35, reclaimed rubber 15, rubber substitute 5, ebonite dust 10, silica 10, magnesia 10, and sulphur 15. (T. S. Seymour, 20 Mount Carmel, Derby, and St. Helens Cable & Rubber Co., Arpley, Warrington, England. British patent No. 139,226.)

AUSTRALIA.

Preserving India Rubber.—To prevent the oxidation of rubber goods, the enzymes are destroyed by the application of a 10 per cent solution of ammonia containing about 0.3 per cent of a saponaceous substance such as sodium oleate, laurate and cresylic acid, carbonic acid or other antiseptic substance which will not precipitate the soapy material. The solution is applied to the latex, or to flexible rubber goods by immersion or by repeated superficial application. (F. E. Stowe, New South Wales. Australian patent No. 3,364.)

Reclaimed Rubber. Process for recovering rubber from waste. (Acushnet Process Co., assignee of T. F. Furness, Pennsylvania, and P. E. Young, Massachusetts, inventors. Australian patent No. 11,970.)

THE FRENCH REPUBLIC.

Reclaimed Rubber. Process for recovering rubber and cotton from waste. (Acushnet Process Co., Inc. French patent No. 501,214.)

GERMANY.

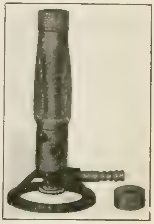
Reclaimed Rubber. Process for reclaiming rubber from soft, elastic, and tensile vulcanized goods. (Farbenfabriken, formerly Friedrich Bayer & Co., Leverkusen, near Köln am Rhein. German patent No. 303,984 "K.")

Reclaimed Rubber. Process for reclaiming rubber from vulcanized substances, having great stretching qualities, firmness, and elasticity. (Farbenfabriken, formerly Friedrich Bayer & Co., Leverkusen, near Köln am Rhein. German patent No. 305,667 "K.")

LABORATORY APPARATUS.

LABORATORY BURNER.

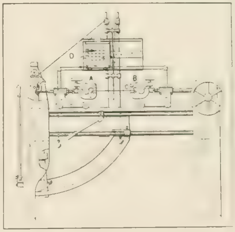
A new form of burner for laboratory use is that known as the "Fisher." Although but recently introduced it is rapidly finding favor with chemists.


The Fisher Burner.

It is provided with perforated nickel grid for hot flame and brass cap for Bunsen flame, thus combining the features of two burners in one. It will produce a flame 1¼ inches in diameter, all of which is hotter than the hot tip of a Bunsen flame, or it can be adjusted to give a clear Bunsen flame, 7/16 inches in diameter. It will burn any gas except acetylene. (Scientific Materials Co., Pittsburgh, Pennsylvania.)

AUTOGRAPHIC FABRIC TESTING MACHINE.

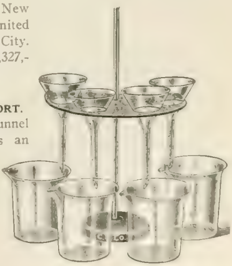
A fecently patented autographic fabric testing device, as shown in the illustration, consists of a horizontal fabric testing machine and a chart holding mechanism. The latter is appropriately connected by means of lever and cord and pulley attachments with the grips A, B, holding the fabric test sample C. The frame carrying the chart is thus made to move horizontally in fixed relation to the strain upon the fabric, and vertically in accordance with the elongation of the fabric. Thus, a curve may be traced on the chart D by a suitable marker which will record the relations of tensile strength and elongation of the specimen under test. (Alfred E. Jury, Newark, New Jersey, assignor to the United States Tire Co., New York City. United States patent No. 1,327,393.)


Fabric Tester.

ALUMINUM FUNNEL SUPPORT.

Stoddard's aluminum funnel support here illustrated is an improvement over the usual clumsy, wooden, two-funnel support. It is arranged for the use of four two-inch or two and one-half inch funnels within a small space.

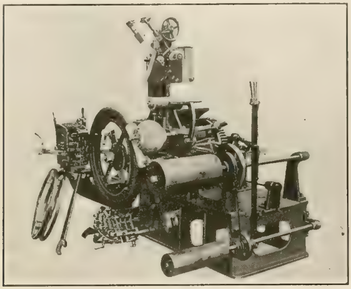
The stand is clean, neat and not easily corroded. (Central Scientific Co., 460 East Ohio street, Chicago, Ill.)


Stoddard's Funnel Support.

New Machines and Appliances.

THE MATHERN TIRE MAKING MACHINE.

Although European manufacturers are familiar with the pneumatic tire-building machine here shown, it is not generally known in this country. For fourteen years it has been in use abroad where 450 machines are successfully operating. The machine possesses many admirable features to recommend it, particularly to the smaller tire manufacturers. It will be remembered that this machine was a silent, yet important witness, in the litigation recorded in The India Rubber World, January 1, 1919, concerning basic tire machine patents.



The Mathern Tire Builder.

A salient feature is the automatic building of the carcass from a continuous fabric strip, and without stopping the machine, thereby insuring regularity of stretch. The strips of frictioned fabric are delivered to the core from the fabric roller located in front of the tension drum and the liner is wound up on the roller beneath. The plies are rolled down by a series of stitcher rollers mounted on levers contained in a roll-box which, when adjusted to the core, automatically completes the rolling-down operation. Positive tension is obtained by a small convex drum, positioned between the fabric roller and the core, and correctly proportioned to the size of tire under construction. Located between this drum and the core is the bridge for guiding the fabric.

There are two bead rings; one is placed behind the core and the other in front, being provided with pins and hooks which insure centering of the beads. The bead rollers are mounted on a pivoted hinge that brings them in position over the core when required and removes them when the bead setting is accomplished. When all the plies are laid under and over the beads the canvas edges are accurately trimmed by a special cutting device.

All sizes of tires from 2½ to 5 inches can be built on this machine by changing a few accessories, and 80 tires per day of 10 hours may be produced by an operator of ordinary skill. (A. Mathern, Zollikow-Zurich, Switzerland. L. J. Broche, 889 Stutz street, Akron, Ohio, United States agent.)

SOLVENT RECOVERY SYSTEM.

The recovery of inflammable and explosive solvents largely used in the rubber industry is interesting because of the increasing cost and the possible diminution in the supply of solvent naphtha. As the demand for cord tires continues unabated, the consumption of impregnated fabric will increase accordingly and result in a greater demand for spreader solvent, therefore, the following description of a method for saving solvent is timely:

In this system no oxygen comes into contact with the solvent vapors and therefore there is obviously no possibility of fire or explosion. This is accomplished by enclosing the entire operation in a gas-proof housing and circulating within the housing flue gas which is composed almost entirely of nitrogen and carbon dioxide. Moreover, the method is not limited by physical conditions, for the relation of the solvent vapors to the drying gases can be made to suit the best drying conditions, and, due to the lack of danger in handling the vapors, it is possible to manipulate them in such a way as to obtain maximum recovery.

The impregnation or spreading operation is continuous as it is possible to sew a new roll of fabric to the one being impregnated. There is no danger in stopping and starting the machine. To get the machine into operation flue gas is forced through the cycle until all the air is swept out. When it is necessary to discontinue operation the flow of flue gas is maintained until all of the solvent has been swept from the system, when air is substituted, thus making it possible to open up the machinery for the cleaning operations which are always necessary in impregnating and spreading.

For small manufacturers of cord tires an impregnator is recommended that will give a maximum production of 900 square yards of cord fabric per hour. As soon as the plant is using 100 gallons of solvent per day the recovery plant should be attached to this impregnator. The recovery plant furnished for this production is such that with the substitution of a larger compressor and condenser it may be arranged to take care of any amount of solvent up to the maximum capacity of the impregnator.

Referring to the illustration, flue gas from the two producers, 2, 2, after being cooled and washed in 3 and 4A, is passed into the impregnator housing 5. The resulting mixture of flue gas and solvent vapor is drawn out of this housing and passed through the forecooler 8A, at approximately atmospheric pressure. It is then compressed and passed through the intercooler 8H. It

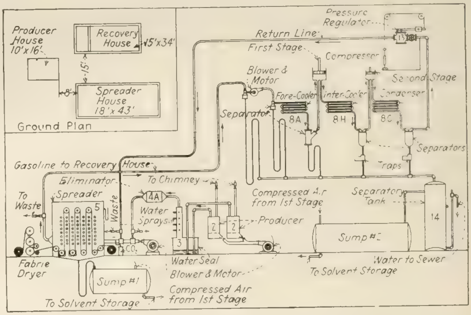
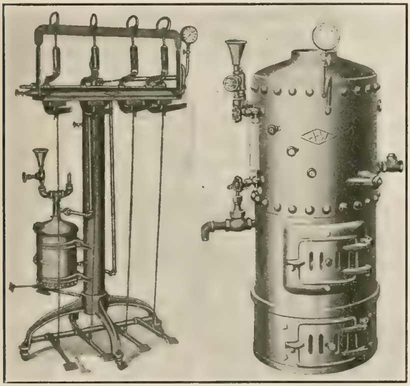


Diagram Showing Operation of the Lewis Solvent Recovery System.

is then further compressed and passed into the condenser 8C. The solvent condensed out in these three coolers is drawn off by gravity to a separation tank 14 where it is separated from any accumulated water, and the residual inert gas reduced to approximately atmospheric pressure by 13 is passed back into the impregnator housing. The system is thus essentially a complete cycle, except as additional flue gas is added to replace losses that must necessarily occur. (Lewis Recovery Corporation, Room 1206, 68 Devonshire street, Boston, Massachusetts.)

AKRON-WILLIAMS TIRE REPAIR NOVELTIES.

Tire repairing as a business will attain a greater development in direct proportion to the energy exercised in building better repairs. That progress is constantly being made in the development of tire repair equipment, to the convenience and economy of repairmen, is shown in the accompanying illustration. On the left is an inverted tube vulcanizer, unique in its adaptation of a principle giving greater efficiency and ease of manipulation. The tube hangs down away from the heat during the cure. The



Inverted Tube Vulcanizer. Universal Boiler.

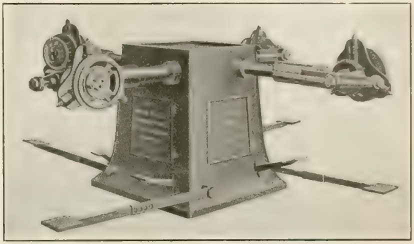
pressure bars are controlled by foot-pedals enabling the repairman to have both hands free to adjust tube on the hot plate. A feature of construction, when this outfit is built to use gasoline as fuel, permits it to be pushed about the garage or repair shop floor at the convenience of the operator.

The special one-and-one-half horse-power boiler or generator shown in the illustration on the right is of vertical tubular type and of steel construction throughout. It is readily convertible from gas or gasoline burning to coal or coke burning with the addition of a small section which fits to the bottom of the boiler unit. This boiler has a very low water line, permitting a gravity return from the vulcanizing units without necessitating the placing of the boiler in the basement or on the next lower floor. (The Williams Foundry & Machine Co., Akron, Ohio.)

CHAMPION TIRE BUILDING STANDS.

Spinning the tire with one hand and using the various tools with the other is eliminated in this machine as the operator has both hands free and can revolve the tire either forward or reverse, at any speed and at any angle, by operating a foot-lever.

These stands are made in three different types. The one shown in the illustration is the base with four projecting arms, enabling four men to work at the stand. The second is the



Four-Man Building Stand.

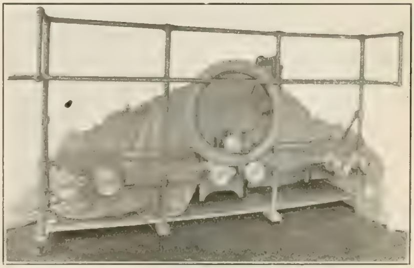
base with two arms parallel with each other, enabling two men to work at the same stand; and the third is the single stand for one man.

The four-man base can be sold with one arm and other arms can always be added as the manufacturer requires them. There are ball bearings on both the main drive shafts, thereby making the machines noiseless and easy to run. (The Braendel Engineering & Machine Co., 724 Dearborn street, Louisville, Kentucky.)

MACHINE FOR COATING INSIDE OF CASINGS.

The problem of coating the inside surface of casings with a preparation so that the casing and tube will not adhere, has been solved by the machine here pictured. After a long period of satisfactory service, and after basic patents have been granted, it is now being brought to the attention of the trade.

The outstanding features of the machine are speed of operation and simplicity. From six to ten tires per minute are lined evenly from bead to bead, and without wasting the liquid, thereby saving at least two-thirds of it as compared with the present hand-swabbing method. Three tires are rotated at a time in a vertical position on drums driven by a small electric motor. The beads of the center tire are held apart by a dished wheel having an operating handle. This permits the spraying device,



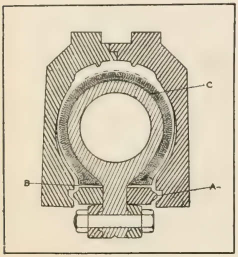
Tire Lining Machine.

which is attached to the handle, to evenly coat the inside of the tire as it revolves. The drum on the left supports the casing to be lined, while that on the right is being rotated to dry the coated casing.

When the center tire has made one revolution, the operator throws up the handle, which stops the spraying and causes all three tires to roll towards the right, thus placing another shoe in position to be coated, and rolling the finished tire into the wrapping room. The complete machine is 7 feet high and occupies a floor space 4 by 12 feet, and may be operated by a girl or one-armed man. (The O. Hammel Co., 209-213 Fourth avenue, Pittsburgh, Pennsylvania.)

S. & B. FLEXIBLE STEEL MOLDS.

Flexible steel molds for making straight-side or clincher tires by the full molded process are said to have fully demonstrated all claims made by the manufacturer.



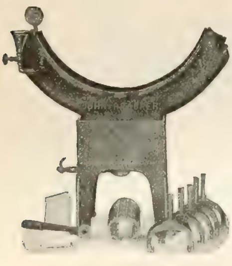
Flexible Straight-Side Mold.

The curing of either fabric or cord tires on solid collapsible cores is made easy. Each half of the mold is provided with saw cuts to allow contraction of the inner diameter of the mold. Each half is dished and made to come together at the tread first, then by applying pressure the mold is closed gradually and progressively toward the beads, forcing the air and excess rubber ahead of the contact points, stretching the fabric also and finally landing the surplus rubber into the overflow cavity A, while all harmful movements of stock toward the tread are eliminated.

By this process it is possible to use beads of larger diameter than those generally used, leaving more space at B, and more room for contraction of bead diameters, which allows more stretch to the sides of the tire carcass during vulcanization. Before placing the tire in the molds, beads and sides of tire are pulled loose from the core to the tread line C, leaving the tread portion cemented to core. (Swinehart & Byrider Process Co., 212 Second National Building, Akron, Ohio.)

HIGH PRESSURE SECTIONAL VULCANIZER.

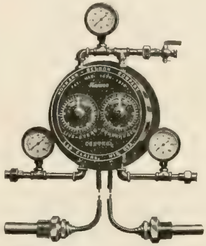
An improvement over the old-style kettle, or wrapped process, is claimed for the Soper high-pressure retreading machines and sectional molds. Among the advantages noted are: wood fiber marking blocks that keep the rubber from overflowing; semi-cure, keeping the rubber from overcuring on lap, which often causes a weak spot on the retread; no matrix to break, as the ribs are cut in the mold; inclosed fire-box, giving four times the heating surface found in ordinary molds and making steaming up 50 pounds possible in 20 to 25 minutes; hand-forged clamps that are practically unbreakable.


The Soper Retreader.

The vulcanizers have self-contained gas-heated boilers, although kerosene burners can be supplied if desired; and they are made in six types, suitable for the smallest oil station or the most completely equipped retread shop. (Soper Vulcanizer Manufacturing Co., 110 East Eleventh street, Los Angeles, California.)

HONECO VULCANIZER TEMPERATURE CONTROLLER.

In this device two controlling systems are compactly combined in one casing, one system to control the inlet steam for maintaining the temperature in a vulcanizer, tire press, retort or any closed space, and the other to control the discharge of condensation and wet steam from the same apparatus. While this combination of two controlling systems in one casing is not new, however, the systems themselves are novel, and interesting.

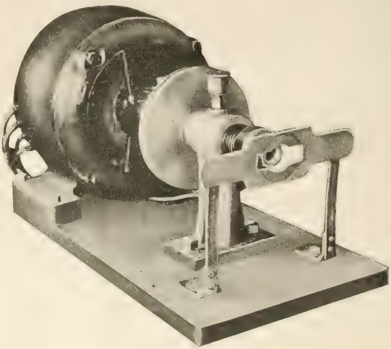

Air-Operated Controller.

There are no fulcrums and levers that require delicate bearings and accurate adjustment and alinement. A valve is located within the adjusting plug, and the latter projects through the front of the casing, permitting the removal of the valve, without the necessity of removing the casing or loosening any connection for adjustment of the air-plug.

The air valve is the most important part of the operating mechanism of any air-operated controller. The Honeco valve is held against its seat by the tension or compression of the spring and is lifted by the expanding capsular diaphragm when inflated by the pressure actuating it. The upward movement of the diaphragm prevents the valve freezing to its seat because of gumming or corrosion. The adjustment or setting is made with a small wrench and as the entire valve is turned, there can be no change of temperature or pressure while adjustment is being made. (Hohman-Nelson Co., Eau Claire, Wisconsin.)

INNER TUBE VALVE NUT TIGHTENER.

The simple but important process of running up the valve nut on the stem of an automobile tire valve is speedily and securely


Valve Nut Tightener.

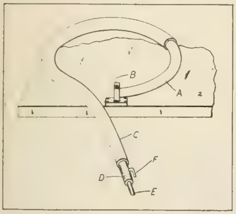
done by various devices, one of which is shown in the accompanying illustration.

In this machine a small electric motor rotates a direct-connected hollow spindle, the entrance to which forms a socket wrench for the reception of the valve nut. In front, a suitable guard is placed which serves as a support against which the operator holds the inner tube and valve base during the tightening process. There is a special clutch with a spring attachment designed to eliminate any danger of the tube catching and turning around while the operator is holding it. (Gillette Rubber Co., Eau Claire, Wis.)

MACHINERY PATENTS.

MANDREL FOR TIRE TUBES.

A discontinuous torus-shaped sheet metal mandrel *A* for forming and curing forced inner tubes is shown in the illustration, together with a suitable bench bracket device *B*, supporting the mandrel for the application and removal of the tube *C*, assisted by compressed air.



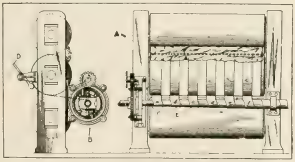
Curing Mandrel for Inner Tubes.

The entrance of the air for inflation is effected through a nozzle *D* attached to a hose *E* and controlled by a suitable valve *F*. (Don A. Clark and Clyde E. Lowe, assignors to the Republic Tool & Manufacturing Co., all of Cleveland, Ohio. United States Patent No. 1,330,785.)

MACHINE FOR MAKING INNER TUBES.

Inner tubes are built up from strips of rubber stock delivered directly from the calender roll and wound on mandrels that are continuously fed in a line parallel to the calender.

A represents a 3-roll calender on which is mounted the mechanism *B* for rotating the mandrels *C* and simultaneously moving them parallel to the calender rolls. The mandrels are constructed so that they can be detachably joined in longitudinal alinement. The strip cutting knives are shown at *D*, and at *E* the strips of rubber stock.



Inner Tube Building Machine.

In starting the winding the strip indicated at (*a*) is wound on the mandrel to form the inner layer or lamination; the strip indicated at (*b*) is wound on the first layer to lap the convolutions of the strip (*a*), and then the strips (*c*), (*d*), (*e*) and (*f*) are successively wound on each other to have succeeding strips overlap the convolutions of preceding strips and to form the layers or laminations of material. Thus, after starting the winding on the first mandrel, the winding of subsequent layers to form a tubular covering on a series of detachably connected mandrels can be continuously performed.

After the strips of material have been wound on the mandrels, the material is cut transversely at the junction of adjacent mandrels, and the separate mandrels with the material thereon are prepared for vulcanization in the usual manner. (William C. Tyler, Racine, Wisconsin, assignor to The Goodyear Tire & Rubber Co., Akron, Ohio. United States patent No. 1,332,774.)

OTHER MACHINERY PATENTS.

THE UNITED STATES.

No. 1,337,536. Apparatus and process for treating rubber. L. A. Wullenweber, assignor to Morgan & Wright, both of Detroit, Mich.

1,337,631. Repair vulcanizer. A. B. Zwebell, Milwaukee, Wis.

1,337,707. Pneumatic air bag core for use in repairing tires. A. L. Johnson and A. O. Alsten, assignors of ¼ each to H. C. Goulding and J. A. Alsten—all of Worcester, Mass.

1,337,910. Expansible core for tires. C. Holm, Bowman, N. D.

1,337,930. Mold for inner tubes. D. Lowe, Akron, O.

1,338,233. Repair die for vulcanizing anti-skid tire treads. O. L. McCormack, Birmingham, Ala.

1,338,407. Tire building machine. E. G. Templeton, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

1,338,470. Machine for forming battery jars. J. H. Wagenhorst, Akron, O.

1,338,569. Inner tube vulcanizer. E. D. Hostler, assignor of ½ to Hamiel & Mather, partners—all of Tipton, Ia.

1,338,844. Device for stacking tire molds. B. H. Rose, Lakewood, O.

1,339,151. Repair vulcanizer. G. S. Andrus, Akron, O.

REISSUES.

14,852. Apparatus for retreading tires. Original No. 1,327,307. R. A. Brooks, assignor to Western Tire & Rubber Co., a copartnership—both of Chicago, Ill.

THE DOMINION OF CANADA.

198,875. Tire tread constructor. J. A. Thomas and E. J. Usher, co-inventors—both of Toronto, Ont.

199,071. Tire-wrapping machine. The Pierce Wrapping Machine Co., assignee of F. M. Pierce—both of Chicago, Ill., U. S. A.

199,214. Apparatus for manufacturing solid rubber tires. The Dunlop Rubber Co., Westminster, County of London, assignee of C. Macbeth and E. Sullivan, both of Birmingham, County of Warwick—all in England.

199,432. Apparatus for making cord-tire casings. J. M. Gilbert, New York City, N. Y., assignee of F. B. Carlisle, Andover, Mass.—both in the U. S. A.

199,463. Marking device for pneumatic tires. G. J. Anderson and W. R. Smith, co-inventors—both of Cleveland, O., U. S. A.

THE UNITED KINGDOM.

138,623. Mold for vulcanizing boots, etc., having adjustable heel and toe pieces and a base mold capable of being put under pressure. D. F. Wilhelmi, Huis ter Aa Doorwerth, Holland. (Not yet accepted.)

139,013. Device for heating hollow rollers used in rubber-working machines. O. Shaw, Kenley, Heaton Moor, Stockport.

139,411. Apparatus for retreading tires. S. H. Goldberg, Chicago, Ill., U. S. A.

THE FRENCH REPUBLIC.

500,417. Improvements in mounting pneumatic tires. A. E. Jennings.

500,878. Improvements in transferring system used especially in manufacturing tires. The Dunlop Rubber Co., Limited.

501,732. Machine to make pneumatic tire casings. J. L. G. Dykes.

501,749. Machine to expand the bands out of which pneumatic tires are made. J. L. G. Dykes.

501,785. Machine for expanding and vulcanizing casings for rubber tires. J. L. G. Dykes.

502,045. Apparatus and method for making tires. E. Hopkinson.

PROCESS PATENTS.

THE UNITED STATES.

No. 1,336,911. Retreading tires in manner to prevent overvulcanization of any part. F. Maier, Los Angeles, Calif., assignor to Western Vulcanizer Manufacturing Co., Chicago, Ill., a copartnership.

1,337,802. Producing artificial leather by treating rubber layers. A. A. Somerville, Flushing, assignor to New York Belting & Packing Co., New York City—both in New York.

THE DOMINION OF CANADA.

199,442. Retreading tires. S. H. Goldberg, Chicago, Ill., U. S. A.

199,443. Retreading tires. S. H. Goldberg, Chicago, Ill., U. S. A.

THE UNITED KINGDOM.

138,535. Retreading tires. S. H. Goldberg, Chicago, Ill., U. S. A.

THE FRENCH REPUBLIC.

500,421. Improvements in the manufacture of solid rubber tires. The Dunlop Rubber Co., Limited.

500,522. Improvements in the manufacture of solid rubber tires. The Dunlop Rubber Co., Limited.

500,698. Improvements in the manufacture of solid rubber tires. The Dunlop Rubber Co., Limited.

501,035. Improvements in manufacture of tires. The Dunlop Rubber Co., Limited.

501,065. Improvements in manufacture of tires. The Dunlop Rubber Co., Limited.

501,099. Improvements in construction of pneumatic tires. W. P. Gordon and T. B. Jacock.

501,201. Improvements in retreading tires. S. H. Goldberg.

501,699. Manufacture of pneumatic tire casings. J. L. G. Dykes.

NEW TRADE PUBLICATIONS.

In the number for April-May of "The Portager," the handsome little monthly magazine issued by the Portage Rubber Co., Akron, Ohio, John W. Maguire, vice-president and general manager, pays a graceful tribute to the branch managers and explains their importance to the business. The number contains portraits of all the branches and office managers of the company from Boston to the Pacific coast, with many other illustrations.

Zwebell Brothers Co., Milwaukee, Wisconsin, has published a profusely illustrated descriptive catalog of 72 pages, devoted to its complete line of tire repair equipment, repair materials and accessories. It covers everything required for the up-to-date repair shop, including sectional cavity vulcanizers and high pressure retreaders of the individual steam-generating type with aluminum bead molds and reducing shells for all tire sizes up to and including 8-inch. The obvious economy and efficiency of these individual steam generators appeal to every repair man.

The Eagle Rubber Co., Ashland, Ohio, publishes a most attractive catalog, illustrated in colors, of the many rubber toys it makes. The cover shows a baby girl with her puppy borne aloft by a bunch of little balloons of many hues. Balloons of many shapes are seen, some with noise-making attachments. The prize novelty, however, is the "Eagle Brand" bag-pipe, with a plaid bag, that should satiate youth's craving for noise.

To spread information about their motor wheels and the many uses to which they may be put, the Briggs & Stratton Co., Milwaukee, Wisconsin, are issuing a handsome illustrated monthly magazine, called "The Motor Wheel Age."

A valuable help for engineering and kindred trades is the "Industrial Arts Index" published by The H. W. Wilson Co., New York City. In alphabetical arrangement, but with many convenient sub-heads, it supplies a subject catalog to the periodicals dealing with engineering and various trades and technical industries. Volume VIII, No. 3, for March, 1920, covers the first three months of the year.

"Holland's East India," which under the management of A. A. van der Kolk, has separated from the Buitenzorg, Java, "Dutch East Indian Archipelago," publishes an edition in French, "Les Indes Hollandaises," as well as an English edition.

"Transatlantic Trade," January, 1920.—This is a monthly magazine published in the English language by the American Association of Commerce and Trade in Berlin, members of which seem to have penetrated into Germany as soon as hostilities ceased. Instructions are given to Americans as to how they may enter Germany equipped for business, and how they may secure protection if they need it. Lists of firms that are permitted to deal with America are printed, and also of the goods that are most needed.

The first number for 1920 of the *"Bulletin des Caoutchoucs"* of the *Marseille Institut Colonial* contains the report and recommendations of Dr. G. van Pelt, the director, on the rubber conditions in the French colonies, where he spent several months last year. He describes French Guinea and the Ivory Coast, tells how cultivation and the processes of preparing and packing the rubber should be changed in accordance with his ideas, and how the African natives may be induced to better their ways. France clearly intends to make a fight for her share in rubber, and Dr. van Pelt's investigation is one of the first steps taken.

Josephine A. Cushman, associate librarian, in the first number of "Faculty Studies," issued by the Municipal University of Akron, explains what "a special library for the rubber industry" should contain, and in the footnotes gives excellent and helpful abridged bibliographies of many branches of the subject. The appendices give the most essential scientific journals and government publications with which a rubber library should start.

THE EDITOR'S BOOK TABLE.

"REPORT OF THE CEYLON CHAMBER OF COMMERCE (INCORPORATED) for the year ended 31st December, 1919." (Paper covers, 346 + 18 pages, charts, tables.)

The "Report of the Ceylon Chamber of Commerce (Incorporated) for the year ended 31st December, 1919," contains the usual important tables and statistical information regarding crude rubber exports and imports from and into the island, with charts, including one in colors, giving rubber prices at local auctions. The larger portion of the volume is taken up with official correspondence and documents, and with the minutes of the meetings of the Chamber.

"AIRCRAFT YEAR BOOK, 1920." MANUFACTURERS' AIRCRAFT Association, Inc. Doubleday, Page & Co., New York. (Cloth, octavo, 9¼ by 6 inches, 334 pages.)

The second yearly issue of the "Aircraft Year Book," besides interesting articles on the development of aircraft in commerce and in war, and reports on the activities of the Manufacturers' Aircraft Association, contains a compact and instructive summary of the technical development of balloons and airships in the years since the beginning of the war. In this, some account is given of the important construction work done in this line during the war by The Goodyear Tire & Rubber and The B. F. Goodrich companies. There are many fine illustrations and useful lists and tables.

REPORT TO THE BOARD OF TRADE OF THE EMPIRE COTTON Growing Committee, 1920. London, His Majesty's Stationery Office. (Paper, 67 pages, 7 maps.)

The report submitted to the British Parliament last October by a committee appointed in the summer of 1917, at the instigation of the British cotton interests, to survey the possibilities for raising cotton within the empire, has been mentioned in the press for some time, but now appears officially.

It is of particular interest because of the desire, openly expressed in many English newspapers, to free the British cotton industry from dependence on the United States. The survey includes Africa, with the possessions recently acquired from Germany, as well as India, the West Indies, and other portions of the empire, where cotton is raised, and is illustrated by the maps. The example of the supremacy that rubber production acquired in a dozen years by the British in Malaya, Ceylon and Southern India, inspired the committee, and should give food for reflection to the American cotton planters.

"DYKE'S AUTOMOBILE AND GASOLINE ENGINE ENCYCLOPEDIA." By A. L. Dyke, E. E. Twelfth edition, A. L. Dyke, St. Louis, Missouri. (Cloth, large octavo, 10 by 7 inches, 940 + 22 pages, profusely illustrated.)

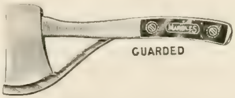
This compendious repertory of automobile information is now in its tenth year, the editions following on one another faster than once a year. The elaborate indexes are a necessary guide through the maze of instructions about the construction, mechanism, handling, adjusting and repairing of automobiles, their engines, the ignition, lubricating, electric systems, tires and their troubles and the myriad matters on which immediate practical information may be needed; everything illustrated fully with pictures and diagrams. Special supplements are added to this edition on airplanes, Liberty engines, the Ford and Packard cars and the K. W. Magneto, together with inserts supplying additions of very recent information to many articles.

By Article 307, Section 2, of the Treaty of Versailles, carried into effect by the Reichs Law of August 31, 1919, all patents and trade marks which were declared void on account of nonpayment of dues during the period between August 1, 1914, and January 10, 1920, are declared valid as from the last-named date.

New Goods and Specialties.

A SAFETY AXE FOR THE SUMMER CAMPER.

Now is the time when plans are going forward for summer camping trips, and no outfit is complete without a reliable axe or strong hatchet with which to blaze trails, cut trees, boughs, and firewood, and do the numberless odd jobs that fall to the lot of the camper. That dealer who can supply his customers with an axe provided with a guard so that it can with safety be put into the coat pocket or packed with other articles without danger of injuring them, should benefit by increased sales. The safety pocket axe shown here has a nickel-plated spring hinged guard lined with lead, that folds into the handle. The blade is made of carefully tempered tool steel, while the metal handles are drop forged, with side-plates of rubber. The length is 11 inches and the weight 20 ounces. (Marble Arms and Manufacturing Company, Gladstone, Michigan.)



SAFETY POCKET AXE.

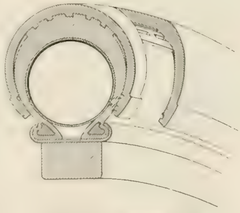
COMBINATION INK AND PENCIL ERASER.

"399 TRI-PLY" RED ERASER.

Designed for the use of the typist who requires a soft eraser to remove pencil marks and carbon impressions as well as inked or typed copy, the "399 Tri-Ply" eraser has found a welcome in the business world. The two outer layers of rubber are soft and velvety, while the center layer is of harder stock. When the center edge is brought to bear upon manuscript written with pen or typewriter, erasing becomes easy. The side edges are used for removing pencil marks. (Weldon Roberts Rubber Co., Newark, N. J.)

A NEW OVERSHOE TIRE.

The tire illustrated claims a new patented feature in a tread which is removable and interchangeable and can be used on all makes of tires as well as on this specially constructed one. The overshoe is made in a separate piece and its inner face opposite the casing is provided with longitudinal and transverse projections and recesses to correspond to those in the tire. This feature insures against creeping, either longitudinally or transversely. There are also a number of suction cups in the inner face of the overshoe, in the thickened side portions, which hold the sides firmly in position on the casing. The tread portion is made of durable rubber and the overshoe is not vulcanized to the casing. The casing, protected by the overshoe, does not come in contact with the ground and is not exposed, therefore wearing indefinitely long. (Brooks J. Mullikin, Box 23, Station N, New York City.)



"MULLIKIN" OVERSHOE TIRE.

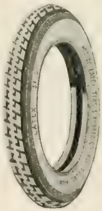
A NEW ARTIFICIAL BAIT.

The angler who enjoys game fishing will welcome this new "Crawdad Natural Crab" bait, with its body so true to life in color and shape, its beady black eyes, and its moving rubber legs. The hooks are bronze. (The Creek Chub Bait Co., Garrett, Indiana.)

"THE CRAWDAD NATURAL CRAB."

THREE NEW WESTERN TIRES.

Three good-looking tires will be produced by a new Western rubber company, as well as an inner tube. The center one of the three tires below is the invention of Grant Lambright, the company's general superintendent. It is intended chiefly for light trucking and has been successfully tried out and tested. It combines the advantages of a pneumatic with those of a solid tire. The non-skid tread is designed to distribute road friction evenly, while the ribbed tire has extra thick side walls. (The Latex Tire & Rubber Co., Fond du Lac, Wisconsin.)



LATEX NON-SKID.

LAMBRIGHT CUSHION.

RIBBED TREAD.

AN IMPROVED STEP-MAT.

The particular feature of the step-mat pictured here is a flap which turns up from the running-board and prevents the scratching of the car by overstepping. The pattern is of the self-draining type, so that any water collected is thrown away by the forward motion of the car. The rubber used is of good quality and serviceable. A running-board mat of this kind is an admirable preventive of slipping when entering a car. (Essex Rubber Company, Trenton, New Jersey.)

"ESSEX IMPROVED" STEP-MAT.

THREE BATHING CAPS FOR SUMMER DAYS.

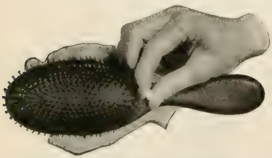
The "Tiger Lily" bathing cap pictured here has a red, blue, green, or yellow body with a large black-striped flower. The

"TIGER LILY." "COLLEGE CAP." "DAISY."

"College" cap is patterned after the familiar "mortar board," with long streamers, and wooden buttons suspended from the corners. The "Daisy" comes in the same colors as the "Tiger Lily" and has each petal apparently fastened down with a rubber button, while a black celluloid buckle forms the center. (The Miller Rubber Company, Akron, Ohio.)

HAIR BRUSH WITH RUBBER CUSHION.

The dainty woman likes a hair brush that can be thoroughly cleaned from time to time, and the one illustrated here accomplishes this by means of a removable rubber cushion to which the high-grade, stiff black bristles are vulcanized. The cushion is removed by means of a button which pulls out as shown in the picture. (O. Dennin's Sons, Inc., Troy, New York.)



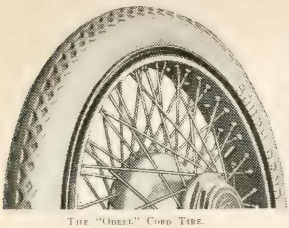
"BEAUTIFIER" SANITARY HAIR-BRUSH.

"ADHESO" MILLINERY GLUE.

A strong millinery glue or rubber cement which is waterproof, colorless, durable, and will not burn or explode, is called "Adheso." It has been tested by the National Board of Fire Underwriters and favorably reported on. This glue is used in various ways in applying trimming to hats, as well as for the insertion of hat linings without sewing. (James B. Day & Co., 214 West Ohio street, Chicago, Illinois.)

STANDARD AND OVERSIZE CORD TIRE.

A cord tire which is made in both standard and oversize sizes enables the car owner to procure either or both for the asking. The conformity of this tire to the original fabric size standards and the standard oversizes make for easier riding and more mileage, without wrenching and straining of the differential and the chassis. The "Odell" cord, it is claimed, insures perfect balance and distribution of the weight of the car. This is a quality tire, hand manufactured. (International India Rubber Corporation, South Bend, Indiana.)



THE "ODELL" CORD TIRE.

A NEW FABRIC-RUBBER SOLE.

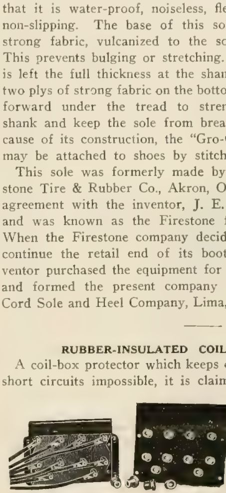
A new fabric-rubber sole is called the "Gro-Cord." In principle its construction follows that of the wood paving block which presents its cross-grain side to traffic. This sole is composed of rows of cord fabric set on end in sequence and vulcanized into the pliable rubber body so that the ends of the cords present themselves on the walking surface. It is claimed that the "Gro-Cord" sole will not cause the sensation of burning sometimes experienced when rubber soles are worn, and that it is water-proof, noiseless, flexible, and non-slipping. The base of this sole is thin, strong fabric, vulcanized to the sole proper. This prevents bulging or stretching. The sole is left the full thickness at the shank and has two plys of strong fabric on the bottom running forward under the tread to strengthen the shank and keep the sole from breaking. Because of its construction, the "Gro-Cord" sole may be attached to shoes by stitching.

THE "GRO-CORD" FABRIC SOLE.

This sole was formerly made by the Firestone Tire & Rubber Co., Akron, Ohio, under agreement with the inventor, J. E. Grosjean, and was known as the Firestone fabric-sole. When the Firestone company decided to discontinue the retail end of its boot and shoe business, the inventor purchased the equipment for the manufacture of this sole and formed the present company to produce it. (The Lima Cord Sole and Heel Company, Lima, Ohio.)

RUBBER-INSULATED COIL-BOX PROTECTOR.

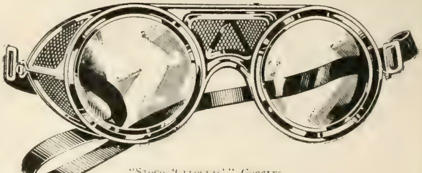
A coil-box protector which keeps out rain and snow and makes short circuits impossible, it is claimed, is shown here. Rubber bushings are inserted in the holes in the plate which forms the protector, and through these bushings pass the electrical connections. (Charles F. Lyngaas, 135 Wooster street, New York City.)



"CASCO" COIL-BOX PROTECTOR.

THE "CELOGLAS" SAFETY GOGGLE.

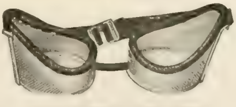
Among the numerous safety goggles now to be had, the one illustrated here claims a peculiar lens construction consisting of a thin sheet of celluloid cemented between two sheets of glass so as to prevent the glass from flying or falling out of the frame when cracked or broken. These goggles are equipped with side shields of perforated nickeled metal and are held in place by elastic webbing which buckles around the head of the wearer. (Standard Optical Company, Geneva, New York.)



"STOCO 'CELOGLAS'" GOGGLES.

THE "WILLSON" SAFETY GOGGLE.

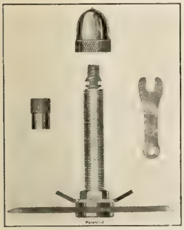
A safety goggle with novel provision for the renewal of the rubber tubing which binds the edges coming in contact with the face of the wearer has aluminum cups with serrated edges. Over the serrations the rubber tubing is fitted by means of short slits. A short piece of rubber tubing is slipped over the leather strap which connects the goggles over the nose. The lenses of these goggles are set in a frame so designed, it is claimed, that if the glass is broken it must fall out instead of in. Besides, the lenses in their frames may be removed by sliding forward the clamp to which the elastic head-bands are attached. (Willson Goggles Inc., formerly T. A. Willson & Co., Inc., Reading, Pa.)



The "Willson" Safety Goggle.

A VALVE THAT LOCKS THE AIR IN THE TIRE.

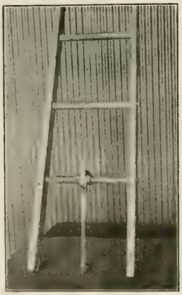
The "Air Lock" tire valve is so constructed that it locks the air in the inner tube for an indefinite length of time, until the tire suffers a blowout or puncture. This valve may be used with any cap, nut, or cleat. The use of a new inner tube is recommended, but an old one which is known not to leak may be used. It is claimed that a permanent degree of pressure may be maintained within the tire by means of this valve, which tends to increase tire life and mileage. The centers of these valves are interchangeable. Five standard sizes are available, for wire, disk, and artillery wheels—2, 2½, 3, 3½ and 4-inch. (The Griffin Manufacturing Co., Inc., 113 State street, Boston, Massachusetts.)



"Air-Lock" Valve.

VACUUM CUP LADDER STAY.

The vacuum cup principle has been employed in working out this safety device for holding ladders in position. A clamp of malleable iron, which is adjustable, fits around the lower rung of any ladder. Through this clamp is inserted a rod, also of malleable iron, whose lower end is cut on a bevel of eight degrees, so that no matter at what angle the ladder is placed, the safety stay exerts a direct downward pressure. The bottom of the rod is adapted for holding a rubber suction cup or a steel point, depending on the nature of the surface on which it is to be used. When the device is not in use, it may be moved over to one side of the ladder and folded up out of the way, if it is not convenient or desirable to remove it entirely. (Maxwell Safety-Ladder-Stay, 101 West 43d street, New York City.)



Maxwell Ladder Stay.

"DURATOP" RUBBER-COATED FABRIC FOR AUTO TOPS.

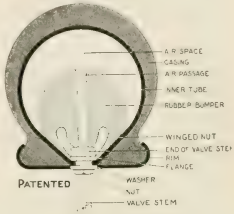
A new material for automobile and carriage tops, curtains, etc., is "Duratop," which has a heavy woven cotton backing coated with rubber. The weight of the material varies according to the purpose for which it is intended to be used. The trade mark has just been registered in the United States. (The Duratex Company, Newark, New Jersey.)

RUBBER MATS BEHIND THE SODA FOUNTAIN.

A new mat, made in one size, color and thickness only, has been designed for use behind soda fountains. It is made with stout rubber disks on the bottom, which hold it one-quarter of an inch off the floor, permitting free drainage beneath. The top layer is of fine, flexible mat stock, corrugated to give a firm footing. Perforations in the mat permit the drainage of any liquid spilled upon it. The mat is 18 by 24 inches. (United States Rubber Company, New York City.)

IT WARNS WHEN TIRE IS FLAT.

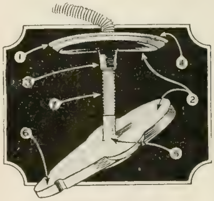
A unique device for warning the automobile driver when his tires are becoming flattened is shown in cross-section in the diagram at the right. A winged nut which forms the end of the valve stem is embedded in a ball of rubber. Whenever the air inside the inner tube becomes reduced as much as fifty per cent, this ball causes a slight bump as the tire revolves. (Columbus Rubber Mills, successors to Tomah Rubber Corporation, Milwaukee, Wisconsin.)



Flat Tire Alarm.

THE "NOKUT" TIRE PLUG.

A new plug for tires that have become punctured emphasizes the following features indicated in the illustration: (1) beveled edge preventing cutting of tire; (2) rubber anchored and chemically welded to metal cores; (3) rubber packing unites cap with base, preventing metal from touching tire; (4) arched cap to conform to tire surface; (5) no open slot to leak; (6) inserting point, with rubber cement, is easily forced into puncture; (7) threaded stem of strong steel so that "Nokut" rubber can be clamped solidly without stripping stem. (Stevens & Company, 375 Broadway, New York City.)



"Nokut" Tire Plug.

A REINFORCED HEEL AND NEW HALF SOLE.

A new non-skid, reinforced rubber heel and sole are illustrated herewith. The heels are made right and left and the outside corner is reinforced with a heel-plate designed to give additional rubber where most people find the greatest amount of wear. The "Paris" heel is made in two sizes only, A and B, and has a concave under surface and a flat upper surface. It is designed to fit only French heel shapes.

The "Portland" non-skid half-sole is made with both plain and corrugated ball surface and includes the original feature of the shank edge reinforced with plies of canvas to hold the heads of the nails. Patents are pending. (Portland Rubber Mills, Portland, Oregon.)

"Paris" Heel.

The Obituary Record.

PROMINENT IN THE LEAD INDUSTRY.

Oliver Sheppard Picher, president of The Eagle-Picher Lead Co., died after a short illness of pneumonia, at his home in Winnetka, Illinois, April 26, 1920.


Oliver S. Picher.

Mr. Picher was born at Springfield, Missouri, but spent his boyhood and youth in California. He was a graduate of Leland Stanford Junior University and Columbia Law School. After three years in the office of Elihu Root, of New York, he went to Joplin, Missouri, where his father, Judge O. H. Picher, was president of The Picher Lead Co., with the intention of practicing law there, but soon became interested in manufacturing and abandoned the law for business. In 1906 he became secretary of The Picher Lead Co., a position which he held for three years, until he was elected president to succeed his father, who had retired and gone to live in California.

In 1916 The Eagle White Lead Co. and The Picher Lead Co. were merged into The Eagle-Picher Lead Co., and Mr. Picher became president of the consolidated companies, a position which he filled with success until his death.

He was director and chairman of the finance committee of the American Zinc Institute; a member of the Society of Colonial Wars, Sons of the Revolution, and Columbia Chapter of Alpha Delta Phi. His clubs were the University, Mid-Day, Union League, Evanston Golf, Indian Hill Golf; and the Midwick Country Club, Los Angeles.

In 1904 Mr. Picher married Emily Stanton, a daughter of William Stanton and a niece of Edwin M. Stanton, President Lincoln's famous Secretary of War, and had four children, two sons and two daughters, Oliver, Charlotte, Stanton and Muriel, all living.

Mr. Picher was a man of unusual vigor, and exceptionally winning personality, so that every man in the company feels his death a personal loss, as do his many friends in the rubber and paint trades. His knowledge, judgment and ability found expression in the business which stands a monument to his talent. Although primarily a business man, he became chief expert in every technical activity of his company. He was an accountant, metallurgist, a mining engineer, a chemist, a manufacturer, a financier, and withal gifted with such rare charm of personality as brought to him literally thousands of friends in the business and technical world.

LEADING CHEMICAL MANUFACTURER.

I. Frank Stone, for many years at the head of the National Aniline & Chemical Co., died in New York on May 10, 1920, in his fifty-fourth year. He was born in Chicago in 1867 and went into the drug business, organizing the firm of Stone & Ware when he was 22. In 1897 he moved to New York, merging with the Schoelkopf, Hartford & Hanna Co. three years later. He became president of the National Aniline company in 1906, retaining the office till last year, when he retired. Mr. Stone was vice-president of the Drug and Chemical Club, president of the Chemists' Club, a director of the Schoelkopf Aniline and Chemical Works, Inc., of the Contact Process Co. and Rollin Chemical Co., and belongs to many clubs. He leaves his widow and one daughter.

CHICAGO MANAGER OF TWITCHELL GAUGE CO.

Max D. Bendel, manager of the Twitchell Gauge Co., Chicago, Illinois, died suddenly from heart failure at Chicago on May 7, 1920.

Mr. Bendel succeeded to the management of the Twitchell Gauge Co. in 1912 shortly after the company was acquired by A. Schrader's Son, Inc., of Brooklyn, New York. In addition to his duties as sales executive of the Twitchell company, he also conducted the Chicago branch of the Schrader company. He was highly successful as a salesman and the rapid expansion of the Twitchell business was in a great measure due to his aggressive personality and enthusiasm.

FOUNDER OF THE KAUFMAN RUBBER CO.

Jacob Kaufman, founder of the Kaufman Rubber Co., Limited, the well-known Canadian rubber footwear manufacturer, who died on April 20, was markedly a self-made man. He was born on a farm in New Hamburg, Ontario, in July, 1847; went to the village school and learned the carpenter's trade. At thirty he married one of his employer's daughters, moved to Berlin, and started a sash and door factory, which prospered.


Jacob Kaufman.

Until 1900 his interests were entirely in lumber, in saw mills, in charcoal and wood alcohol factories. Then he became interested in rubber and the Berlin Rubber Footwear Co. Three years later he started the Merchants Rubber Co., which he sold in 1906 to the Canadian Consolidated Rubber Co., Limited. The following year he started the Kaufman Rubber Co., Limited, at Berlin, which in the late war was rechristened Kitchener, building and repeatedly enlarging the plant, that is now one of the most modern rubber footwear factories in Canada.

Mr. Kaufman took part in the public and religious life of the town he had built up. He leaves his widow, two daughters and two sons, three brothers and four sisters.

OVER THIRTY YEARS WITH TYER RUBBER CO.

Frank Tyler Carlton, purchasing agent of the Tyer Rubber Co., Andover, Massachusetts, died recently at his home in Andover after a brief illness. He was a native of Andover and was always active in the affairs of the community, especially in connection with the church life of the village.

Mr. Carlton began his business career with the Tyer Rubber

Co. in June, 1886, coming to the company immediately after his graduation from high school, and continuing there until several weeks before his death

EDITOR OF "WILEMAN'S REVIEW."

Joseph Philip Wileman, editor of "Wileman's Brazilian Review," died at São Paulo, Brazil, on April 18, 1920, at the age of 67 years. He was born at Uttoxeter, England, in 1853, and went to Brazil in 1898. He established himself at Rio de Janeiro, where he started his journal and also the printing establishment which he owned, the "*Imprensa Ingleza.*" He took a deep interest in Brazilian finance and economics and was chosen to organize the official statistical bureau, of which he was the head until a few years ago. While in charge he compiled and published the admirable "Brazilian Year Book." Mr. Wileman had long suffered from a lingering disease. He leaves a son and three daughters; the son, H. F. Wileman, will edit and manage the "Review," which will continue.

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

(806.) A request has been received for the addresses of manufacturers of machinery for making friction fabrics, including friction tape.

(807.) A correspondent desires to buy rubber plates for dress shields, in quantity.

(808.) The names of makers of dipped goods machinery are requested.

(809.) A repairman desires to know how to separate rubber from fabric to make rubber gum and tire cement.

(810.) A rubber waterproofing for canvas covering is required by a manufacturer of surf coasters.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Requests for each address should be on a separate sheet, and state number.

District Offices.	Cooperative Offices.
New York: 734 Customhouse.	Cleveland: Chamber of Commerce.
Boston: 1801 Customhouse.	Cincinnati: Chamber of Commerce; General Freight Agent, Southern Railway, 96 Ingalls Building.
Chicago: 504 Federal Building.	Los Angeles: Chamber of Commerce.
St. Louis: 402 Third National Bank Building.	Philadelphia: Chamber of Commerce.
New Orleans: 1020 Hibernia Bank Building.	Portland, Oregon: Chamber of Commerce.
San Francisco: 307 Customhouse.	Dayton, Ohio: Dayton Chamber of Commerce.
Seattle: 848 Henry Building.	

(32,571.) A merchant in Chile wishes to communicate with makers of machinery for the manufacture of rubber goods, such as rubber overshoes, raincoats, and hot-water bottles. Catalogs requested.

(32,575.) An engineer in Belgium desires an agency for the sale on commission of rubber articles. Correspondence and catalogs in French.

(32,671.) An importer in Turkey wishes to be put in communication with manufacturers and exporters of rubber goods and rubber shoes.

(32,684.) A merchant in Algeria desires an agency for the sale of manufactured rubber articles of all kinds, automobile and truck tires, inner tubes, bicycle and motorcycle accessories, raincoats, pharmaceutical supplies and so forth. Quotations c. i. f. Algeria. Correspondence in French.

(32,694.) A firm in Mexico wishes agency for the sale of rubber belting. Quotations f. a. s. New York or San Francisco. Catalogs and samples requested.

(32,703.) A commercial agency in Mexico wants agency for sale of druggists' sundries, hot-water bags and bottles, etc. Quotations f. a. s. New York or San Francisco.

(32,721.) A merchant in Switzerland desires an agency for the sale of all kinds of rubber goods and novelties, druggists' and hospital supplies. Quotations c. i. f. Marseilles, France. Cash against documents. Correspondence may be in English.

(32,775.) A company in Danzig wants an exclusive agency for automobiles, accessories, and tires; also wishes to purchase goods on own account. Quotations c. i. f. Danzig. Cash against documents at Danzig. Correspondence in German.

(32,796.) An importer in India wants an agency for the sale of rubber goods of all qualities. Quotations c. i. f. Colombo, Cochin or Tuticorin. Payment by documentary credits at 90 days' sight.

SEVENTY CARLOADS OF ZINC OXIDE.

The illustration shows one of the two trainloads of zinc oxide sent from the New Jersey Zinc Company's works at Palmerton, Pennsylvania, to the tire factories at Akron, Ohio,

A Solid Trainload of Zinc Oxide for Akron Rubber Mills.

as "emergency specials," during the recent railroad strike. There were seventy carloads, weighing about 150 tons, all of the XX lead-free grade. The trains were run on a special schedule almost as fast as passenger trains and relieved the acute shortage of zinc oxide at the rubber plants.

The New Jersey Zinc Company's new plants now under construction will be completed probably in the early fall. The plant at Cañon City, Colorado, will furnish a grade of zinc oxide especially suitable for the requirements of the rubber industry.

SUMMER MEETING OF THE S. A. E.

The program is announced for the summer meeting of the Society of Automotive Engineers to be held at Ottawa Beach, Michigan, from June 21 to 25. On Monday, June 21, there will be sessions of the Standards Committee and in the evening, the semi-annual business meeting will be held. Sports have been arranged for every afternoon, and prizes will be given for each contest—base ball, tennis, golf, and some new games. Tuesday, June 22, the fuel session; Wednesday, June 23, transportation; Thursday, June 24, farm power, and Friday, June 25, the labor question and factory organization. There will be exhibits of automotive apparatus, like those of last year.

ORGANIC ACCELERATOR.

Triphenyl guanidine, a highly concentrated product from aniline oil and thiocarbanilid, is quite well known among the rubber laboratories as a vulcanization accelerator with recognized advantages. Among these are its efficiency as a catalyzer and its lesser cost as compared with other catalyzers of similar strength.

Activities of The Rubber Association of America.

RATES TO PACIFIC COAST PORTS AND TRANSCONTINENTAL INTERMOUNTAIN TERRITORY.

At the March meeting of the Traffic Committee, consideration was given to a complaint now before the Interstate Commerce Commission, with respect to a proposal of the carriers to revise rates from all territory east of the Missouri River to San Francisco, Seattle, Spokane, Nevada and Arizona points, etc., which if accomplished would result in substantial increases in rates on articles of rubber manufacture from shipping points east of Chicago, Illinois, and St. Louis, Missouri. It is felt by the Traffic Committee that this proposed revision of rates would result in disadvantages to the members of the Association who market their product at far Western points, and for this reason the Committee has presented objections to this proposed action of the carriers. The Traffic Department and the Committee's commerce attorney appeared in this case for the Association at the hearings held before the Interstate Commerce Commission in New York on May 7 and Chicago on May 10.

CASH PAYMENT OF FREIGHT CHARGES.

The Interstate Commerce Commission held a hearing in Washington in order to obtain the views of the shippers and the railroads with respect to the cash payment of freight charges, with the idea of formulating rules for the guidance of the railroads based on the revisions of the new Transportation Act, providing that the carriers shall be responsible for the collection of correct freight charges on and after July 1, 1920, with such exceptions thereto as may be permitted by the Interstate Commerce Commission.

During the period of Federal Control, the United States Railroad Administration discontinued granting limited credit that had been accorded shippers under certain conditions by the individual carriers, and required the payment of freight charges by those formerly receiving credit, within forty-eight hours after the presentation of freight bills.

The Traffic Department was represented at this hearing in Washington and presented a proposal on behalf of the rubber industry, asking that the Commission prescribe rules permitting an extension of the credit time to seven days from date of presentation of freight bills; each month to be divided into four payment periods. It is understood that this request is predicated upon the Commission requiring satisfactory guarantee being furnished the carriers by the shippers.

RUBBER ASSOCIATION BULLETIN SERVICE.

The Rubber Association of America maintains an information service through "Bulletins" for its members by which it calls their attention to matters that may concern them. During the past month bulletins have been sent out covering the following subjects that are important to the question of industrial relations: "Saving Banks Deposits in the United States"; "Expenditures of Trade Unions in the United States"; "Sharing Savings in Production with Labor"; "Report of Second Industrial Conference"; and the following report on physical examination.

THE PHYSICAL EXAMINATION IN INDUSTRY.

The Conference Board of Physicians in Industry has just completed a study of physical examinations in twenty-eight corporations who together employ over 350,000 men and women. The returns indicate quite clearly that while the physical examination in industry is comparatively new, employers and employes have recognized its value. Of the twenty-eight plants studied, physical examinations were introduced in one as early as 1900; in two others between 1900 and 1910; in six others between 1910 and 1914, and in the remaining nineteen, during or since 1914. In only one instance, that of a textile mill employing 2,700 persons, was the physical examination discontinued. The reason given in this case was "labor conditions."

In general, employes welcome the examination. The number of those objecting was found to constitute a fraction of 1 per cent and was regarded as too small to tabulate. The reason given by employes who objected to examination invariably took one or both of two forms: "red tape" and "opposition to exposure." Employes who object to examination are frequently those who fear that such an examination will disclose some defect or a diseased condition.

In the plants studied, it was found that of all employes examined, the average number of those rejected was four in every hundred. In six plants employing women, the physical examination was made by a woman physician. In another plant, women workers could upon application have a woman physician examine them. In the other plants, women were examined by male doctors. With but five exceptions, the results of the physical examination are used as a guide in placing employes within the factory. In these five cases the examinations are made for special reasons only and are not required of all applicants. The time required by the physicians to make the examination was found to vary from three to forty minutes, the average ranging between six and ten minutes.

The benefits claimed for the physical examination in the replies received, are that they protect the employe, his fellow worker, and also the employer. Employes are not permitted to engage in an occupation in which they would be a menace to themselves, to others, or to property. Accident hazards are thereby reduced, labor turnover is reported as being lessened, and employes, on the whole, as being more satisfied.

Through the general bulletin service, rubber manufacturers were informed that Trade Commissioner Sanger has completed his report on advertising methods in Argentina, Uruguay, and Brazil, and it is now ready for distribution. Copies can be obtained for thirty cents currency by applying in person to any of the district or cooperative offices of the Bureau of Foreign and Domestic Commerce, or by addressing the Superintendent of Documents, Washington, D. C.

Copies of the "Memorandum on the Rubber Industry Prepared by the War Service Committee of the Rubber Industry of the U. S. A." and the addendum of authorities for the statements made in that memorandum were sent to all firm members of the association.

A list of export business opportunities was sent to firm and affiliated members.

EXCELSIOR RUBBER PASTE.

A new softening ingredient to assist the incorporation of ground rubber waste in rubber mixings has recently been introduced to the American rubber trade by its English manufacturers. It may be employed to the extent of ten per cent of the batch and is said not only to facilitate the mixing operation but to improve the finished material.

PROOFING FORMULA.

The following formula for a proofing mixture is proposed by Perkin and Mandleberg: cauotchouc 25 parts, dry alumina 60, asbestos powder 7, litharge 6, and sulphur 1 part.

This mixing is dissolved in naphtha and applied by a spreader. Vulcanization is effected by steam heat. (*"Le Caoutchouc et la Gutta Percha."*)

News of the American Rubber Industry.

DIVIDENDS.

THE Ajax Rubber Co., Inc., New York City, has declared its regular quarterly dividend of $1.50 a share, payable June 15 on stock of record June 1, 1920.

The Bergougnan Rubber Corporation, Trenton, New Jersey, declared a quarterly dividend of one and three-quarters per cent, payable May 15 on preferred stock of record April 10, 1920.

The Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, has declared its regular quarterly dividend of $3 on common stock and its semi-annual dividend of $3 on preferred stock, both payable June 15 on stock of record June 1, 1920.

The Brunswick-Balke-Collender Co., Chicago, Illinois, declared the following dividends: stock, 200 per cent, payable May 15; quarterly, one and three-quarters per cent, payable May 15 on stock of record May 4, 1920.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, has declared its quarterly dividend of one and three-quarters per cent, payable June 15 on preferred stock of record May 31, 1920.

The General Electric Co., Schenectady, New York, has declared quarterly dividends as follows: cash, two per cent, and stock, two per cent, both payable July 15 on stock of record June 10, 1920.

The Globe Rubber Tire Manufacturing Co., Trenton, New Jersey, has declared a quarterly dividend of one and one-half per cent, payable June 15 on common stock of record May 31, 1920.

The Lee Rubber & Tire Corporation, Conshohocken, Pennsylvania, has declared a quarterly dividend of fifty cents a share, payable June 1 on stock of record May 15, 1920.

The National Aniline & Chemical Co., New York City, has declared a quarterly dividend of one and three-quarters per cent, payable July 1 on preferred stock of record June 14, 1920.

The New Jersey Zinc Co., Inc., New York City, has declared a quarterly dividend of four per cent, payable May 10 on stock of record April 30; and a stock dividend of 20 per cent on its $35,000,000 of stock outstanding, payable June 10 on stock of record May 12. Stockholders may subscribe before November 15, 1920, to $7,000,000 of new stock at par, $100, on the basis of one share for every five already held.

The Star Rubber Co., Akron, Ohio, declared a 100 per cent stock dividend, payable April 1, and gave to stockholders of record April 20 the right to subscribe to common stock at par up to 20 per cent of their holdings, the stock to be issued May 1.

The Victor Rubber Co., Springfield, Ohio, has declared a quarterly dividend, increased from seventy-five cents to one dollar a share, payable May 15 on common stock.

NEW INCORPORATIONS.

Astor Rubber Co., Inc., May 15, 1920 (New York), $250,000. S. M. Cohen, H. M. Cunningham, H. L. Klein—all of 2 Rector street, New York City. To manufacture rubber goods, coats, tires, etc.

Barr Rubber Products Co., The, April 1, 1920 (Ohio), $25,000. N. Barr, president and general manager; J. Dorn, vice-president; W. H. Adams, secretary and treasurer—all of Lorain, Ohio. Principal office, Lorain, Ohio. To manufacture toy balloons, bathing caps, etc.

Bartoo Tire & Rubber Co., Inc., May 12, 1920 (New York), $25,000. H. C. Bartoo, L. C. Olden, both of Eden; A. L. Endres, 94 Grant street, Buffalo—both in New York. Principal office, Buffalo, New York. To manufacture tires, etc.

Bes-Yet Tire Service Co., Inc., The, April 30, 1920 (New York), $10,000. R. Kull L.; N. Daymont, both of New York Mills; J. N. Daymont, Utica—both in New York. Principal office, Utica, New York. To repair tires.

Coast Tire & Rubber Co., August 29, 1919 (California), $50,000. H. Ives, president; J. J. Pankratz, vice-president; N. B. Campbell, treasurer; W. D. Forbes, secretary; E. Lawhorn, superintendent. Principal office, 408 Syndicate Building, Oakland, California. To manufacture tires and tubes.

Elasto Textile Co., March 30, 1920 (New York), $15,000. H. Stott, C. F. Jones, J. J. Healey—all of Cohoes, New York. Principal office, Cohoes, New York.

Enterprise Vulcanizing Co., April 15, 1920 (New York), $10,000. A. and M. Herman, C. H. Paulsen—all of 402 Dean street, Brooklyn, New York. Principal office, Brooklyn, New York.

Everwear Tire Co., April 23, 1920 (Delaware), $1,000,000. W. S. Gaantt, St. Louis; B. N. Morris, Kansas City—both in Missouri; W. O. Young, Wagstaff, Kansas. To manufacture and sell rubber tires and inner tubes, etc.

Fort Pitt Rubber Products Co., March 23, 1920 (Delaware), $1,000,000. J. A. Irwin, M. L. Rogers, W. G. Singer—all of Wilmington, Delaware. To manufacture and deal in rubber and its by products.

Gillette Tire & Rubber Co., March 30, 1920 (Delaware), $100,000. R. K. Thistle, A. R. Meyers, R. J. Gorman—all of New York. To manufacture tires.

Glendenning Asbestos & Rubber Corp., May 8, 1920 (New York), $110,000. W. J. Glendenning, 2003 Albemarle Road, Brooklyn; S. J. Lieneskind, Pelham; L. D. Kimbal, 243 West 21st street, New York City—All in New York. To manufacture rubber and asbestos products.

Hale & Co., R. H., March 3, 1920 (New York), $15,000. R. H. Hale, L. G. Hamersley. Principal office, 1947 Broadway, New York City. To deal in tires.

Hudson Tire & Rubber Co. of Pittsburgh, May 6, 1920 (Delaware), $1,000,000. B. H. Resnick, S. Golb, J. Gusky—all of Pittsburgh, Pennsylvania.

Ideal Tire & Supply Co., March 30, 1920 (New Jersey), $50,000. A. W. Combs, 470 Norwood street; T. F. McHugh, 465 Norwood street, both of East Orange; F. Stiers, 329 Essex avenue; P. D. Jones, 9 Lenark avenue, both of Newark—both in New Jersey. Principal office, 197 Market street, Newark, New Jersey. Agent in charge, F. Forlenza. To manufacture, buy, sell, and generally deal in tires, etc.

Indiana Rubber & Tire Co., Inc., May 4, 1920 (New York), $10,000. J. Eisner, 1800 Seventh avenue; J. Deitcher, 970 Eighth avenue, both of New York City; I. Weisman, 134 Alabama avenue, Brooklyn—both in New York. To manufacture tires.

Larson, Jr., Corp., L. P., April 9, 1920 (Delaware), $5,500,000. T. L. Croteau, M. A. Bruce, S. E. Dill—all of Wilmington, Delaware. To Manufacture paper, rubber, etc.

Lima Rubber Co., The, February 18, 1920 (Ohio), $200,000. (On April 28, 1920, the name of this concern was changed to The Lima Cord Sole & Heel Co.) J. E. Grosjean, president; F. L. Maire, vice president; F. E. Harman, secretary; F. W. Cook, treasurer. Principal office, 447 North Elizabeth street, Lima, Ohio. To manufacture Gro-Cord rubber soles and heels.

Lynch Safety Pneumatic Automatic Tire Corp., April 21, 1920 (New York), $60,000. J. B. Lynch, W. B. Shaul, H. E. Waite—all of Syracuse, New York.

McPhillips & Co., Inc., C. F., May 13, 1920 (New York), $5,000. C. F. McPhillips, D. R. Baldwin, H. T. Hall—all of 27 Pine street, New York City. To deal in rubber.

Muller Tire & Rubber Co., Inc., The, May 5, 1920 (New York), $52,500. W. H. Muller, 128 West 129th street; H. J. Wendorf, 103 West 77th street; A. F. Tompkins, 1210 Boynton street, Bronx—all of New York City. To distribute tires, etc.

Ohio State Rubber Tire Co. of New York, Inc., May 11, 1920 (New York), $100,000. R. S. Ireland, 690 St. Nicholas avenue, New York City; R. L. DeLisser, Great Neck; E. O. Machlin, New Rochelle—all in New York. To manufacture and deal in tires.

Palladium & Rubber Co., March 24, 1920 (Delaware), $3,750,000. T. L. Croteau, M. A. Bruce, S. E. Dill—all of Wilmington, Delaware. To manufacture auto tires, etc.

Parker Collapsible Rim Sales Co., April 20, 1920 (Delaware), $1,100,000. R. K. Thistle, 65 Cedar street, A. R. Myers, R. J. Gorman—all of New York.

Phoenix Tire Mold Co., May 3, 1920 (Delaware), $300,000. M. L. Horty, M. C. Kelly, S. L. Mackey—all of Wilmington, Delaware.

Prudential Rubber & Fabric Corp., March 23, 1920 (Delaware), $27,500,000. T. L. Croteau, M. A. Bruce, S. E. Dill—all of Wilmington, Delaware.

Rawhide Products Corp., May 19, 1920 (New York), $50,000. F. Lilienthal, 1150 Broadway; R. M. Neuberger, 215 West 88th street; L. Loeb, 1475 Broadway—all of New York City. To manufacture tires and auto equipment.

Self Propelling Nozzle Co., Inc., April 7, 1920 (New York), $25,000. S. Sladden, president; H. S. Ashmun, vice-president; R. H. Ashmun, secretary. Principal office, 233 Broadway, New York City. To manufacture and sell the "Victory" self-propelling nozzle. (See THE INDIA RUBBER WORLD, September 1, 1919, page 702.)

Simpson Rubber Products Corp., April 26, 1920 (New York), $25,000. N. Ballin, 1855 80th street; H. E. Munich, 1462 Bushwick avenue, both of Brooklyn; L. Zimmerman, 68 Lewis street, New York City—both in New York. To manufacture rubber, chicle, gum, etc.

Simpson & Simpson, Inc., May 4, 1920 (New York), $1,000. N. Ballin, 1855 80th street; H. F. Munich, 1462 Bushwick avenue, both of Brooklyn; L. Zimmerman, 68 Lewis street, New York City—both in New York. To conduct a rubber brokerage business.

Synthetic Rubber Products Co., April 9, 1920 (Delaware), $3,000,000. E. W. Lohrman; A. C. Sievera, J. C. Wichman. To manufacture all kinds of rubber products.

Terrell Tire & Rubber Co., April 19, 1920 (Delaware), $1,000,000. T. L. Croteau, M. A. Bruce, S. E. Dill—all of Wilmington, Delaware. To manufacture tires.

Van Woud Rubber Co., April 10, 1920 (New Jersey), $125,000. F. and C. J. Pring, H. L. and A. D. Bruen—all of South Sixth and Bergen streets, Harrison, New Jersey. Principal office, corner of South Sixth and Bergen streets, Harrison, New Jersey. Agent in charge, H. L. Bruen. To manufacture, sell, and deal in druggists' sundries, rubber goods of all kinds, etc.

Voice Tire Exchange, Inc., May 5, 1920 (New York), $10,000. A. Voice, Passaic, New Jersey; J. H. Metz, 312 South Broadway, Yonkers; J. A. Voice, 210 Eleventh avenue, New York City—both in New York. To manufacture and deal in tires.

Wear Best Gaiter & Suspender Co., April 15, 1920 (New York), $20,000. M. Sternfield, W. Brill, I. M. Glickman—all of 57 East Third street, New York City.

Wonderseal, Inc., April 23, 1920 (New York), $500. L. H. Crough, 301 Columbus avenue; H. W. Frey, 1210 Clay avenue, both of New York City; S. R. Fleisher, 817 Avenue N, Brooklyn—both in New York. To manufacture a chemical compound for making tires puncture proof.

PERSONAL MENTION.

Walter J. Bitterlich, plant engineer for the Hood Rubber Co., Watertown, Massachusetts, for the last fourteen years, has accepted a similar position at the new plant of The Seamless Rubber Co., New Haven, Connecticut.

O. G. Hellner, formerly special Iowa representative of The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio, has been placed in charge of the Iowa territory of the Globe Rubber Tire Manufacturing Co., New York City.

E. B. Thompson, former special representative of the Michelin Tire Co., Milltown, New Jersey, has been placed in charge of the central Illinois territory of the Globe Rubber Tire Manufacturing Co., New York City.

D. J. T. Kennedy, formerly advertising manager of The Mason Tire & Rubber Co., Akron, Ohio, is now assistant secretary and director of advertising and sales for the new Latex Tire & Rubber Co., Fond du Lac, Wisconsin.

C. R. Collins and Lee Folger have been elected directors of the McClaren Rubber Co., Charlotte, North Carolina.

T. S. Lindsey, until recently eastern district manager of the branches of the Kelly-Springfield Tire Co., New York City, has been appointed a special representative of the sales department.

Gladding Price, for the last two years in charge of factory compounding for the Davol Rubber Co., Providence, Rhode Island, has been appointed assistant to A. A. Somerville, manager of the rubber department of R. T. Vanderbilt Co., 50 East 42d street, New York City, and began his new duties May 1. Mr. Price was formerly with The Goodyear Tire & Rubber Co., Akron, Ohio, and with the United States Rubber Co.

Charles C. Phelps has become associated with the Uehling Instrument Co., 71 Broadway, New York City, combustion engineers and manufacturers of fuel economy apparatus. He is devoting most of his time to research work in connection with the efficient combustion of fuel oil in boiler furnaces. He is a graduate of Stevens Institute of Technology and an associate member of the American Society of Mechanical Engineers.

E. A. Oldershaw has been appointed manager of sales, in charge of the waterproofing department of the Mitchell-Rand Manufacturing Co., New York City, manufacturer of electrical insulating materials. Mr. Oldershaw has been engaged in the structural compound and waterproofing business for over fifteen years.

L. Brandenburger, formerly located in the Walker Bank Building, has taken larger quarters at 59 West Broadway, Salt Lake City, Utah. He has been recently appointed sales representative of The Cutler-Hammer Manufacturing Co., Milwaukee, Wisconsin, for the territory including Utah, the western part of Wyoming, and three-quarters of the state of Idaho.

George B. Fink, Jr., has been appointed manager of the new rubber trades department of The Chas. R. Sargent Co., Engineers Building, Cleveland, Ohio, handling a complete line of pigments, chemicals, oils and colors, and naval stores suitable for the rubber trade.

C. E. Thompson, president, and M. L. Heminway, general manager of the Motor and Accessory Manufacturers' Association, will sail for Paris on June 5, on the *Kroonland*, to represent the Association at the meeting of the International Chamber of Commerce in Paris on June 21. They will also study the conditions of the European automobile industry.

E. B. Harral has suceeded H. C. Danaher as manager of the New Orleans office of G. Amsinck & Co., Inc., New York City.

Bertram G. Work, president of The B. F. Goodrich Co., Akron, Ohio, was one of the 1550 passengers who sailed for Europe on the *Mauretania* when she left New York City, April 24.

Dr. Frederic Dannerth has recently accepted the position of chief chemist of the C. Kenyon Co., Brooklyn, New York, in charge of the chemical laboratory of the tire department at the Bay Ridge works.

John A. Horner, former branch manager of The Fisk Rubber Co., Baltimore, Maryland, has been appointed manager of the Baltimore district with headquarters in that city. Mr. Horner has been connected with The Fisk Rubber Co. since August, 1911, when he entered its employ at the Baltimore branch. In January, 1913, he was appointed salesman out of this branch and in June, 1915, was made manager of the Richmond, Virginia, branch. On January 1, 1918, Mr. Horner reported for active duty with the United States Navy, serving until January 30, 1919. He immediately reentered the employ of the Fisk company as manager of its Fort Wayne, Indiana, branch. On November 1, 1919, he returned to Baltimore as branch manager, where he has remained until the present time. Mr. Horner succeeds E. J. McLaughlin, who has been granted a leave of absence because of ill health.

J. A. HORNER.

C. A. Warren, formerly manager of the Fisk company's branch at Roanoke, Virginia, succeeds Mr. Horner as Baltimore branch manager.

Alfred Whiteway and Leonard Brown, both directors of Chas. Macintosh & Co., Limited, Manchester, England, were in the United States last month and visited rubber factories in the East and the Akron district.

MEETING OF AMERICAN SOCIETY FOR TESTING MATERIALS.

The American Society for Testing Materials will hold its twenty-third annual meeting at Asbury Park, New Jersey, on June 22-25, 1920. The reports of interest to the rubber trade will be made on Thursday afternoon, June 24, when E. A. Barrier, chairman of Committee D11, will report on rubber products, J. M. Bierer will describe a test of special steam hose, and G. B. Haven, chairman of Committee D13, will report on textile materials.

THE RUBBER TRADE IN THE EAST.

By Our Regular Correspondent.

NEW YORK NOTES.

THE LEE RUBBER & TIRE CORPORATION, New York City and Conshohocken, Pennsylvania, at the annual meeting elected the following directors: H. C. Coleman, J. Carl DeLaCour, John M. Dettra, James A. Fayne, Stephen B. Fleming, Albert A. Garthwaite, Walter R. Herrick, Horace C. Jones, Samuel H. Miller, John J. Watson, Jr., and Joseph Wayne, Jr. At the organization meeting the following officers were elected: John J. Watson, Jr., president and chairman of the board; Albert A. Garthwaite, vice-president and treasurer; Henry Hopkins, Jr., secretary; W. B. Dunlap, assistant treasurer; and John M. Dettra, assistant secretary.

The Ajax Rubber Co., Inc., New York City, recently ratified an increase in the capital stock from $10,000,000 to $20,000,000, par value $50 per share, to provide for future requirements of the business, but it is not planned to issue any of this newly authorized stock at the present time.

The Tropical Rubber Co., 365 Broadway, New York City, is a Delaware corporation organized November 6, 1917, with a capitalization of $400,000, for the purpose of manufacturing and

selling automobile tires and tubes and similar articles. Since that time the certificate of incorporation has been amended and the capitalization increased to 100,000 shares, par value $10 per share, and 100,000 shares, no par value. The officers are: George V. S. Williams, president; Henry W. Van Alen, treasurer; and F. C. Woods, secretary.

R. H. Hale & Co., 1947 Broadway, New York City, has been organized by R. H. Hale, formerly in charge of the New York City store of The B. F. Goodrich Rubber Co., to do a general business dealing in pneumatic tires of all leading makes.

William H. Stiles & Co., New York City, crude rubber brokers, have removed to No. 1 Liberty street, Rooms 1807-1809.

The Kelley Tire & Rubber Co., New Haven, Connecticut, has established its New York factory branch at 1656 Broadway, corner of 51st street, New York City.

The Firestone Tire & Rubber Co., Akron, Ohio, a West Virginia corporation, has appointed E. P. Jones its New York representative, with headquarters at 1871 Broadway, the New York City office.

A vacancy on the board of directors of the United States Rubber Co., New York City, having been caused by the decease of Theodore N. Vail, at the annual meeting of stockholders on April 20, 1920, George R. Deshler, of New Brunswick, New Jersey, was elected the twenty-fourth member. The personnel of the operating council was also elected, as follows: Charles B. Seger, chairman; Homer E. Sawyer, Elisha S. Williams, J. Newton Gunn, Ernest Hopkinson, and W. G. Parsons. The other officers elected are the same as given in THE INDIA RUBBER WORLD, May 1, 1920.

The Executive Committee of the Motor and Accessory Manufacturers' Association, New York City, at its recent meeting in Atlantic City, after a canvass of its members, adopted resolutions opposing the introduction of the metric system into American industries.

PENNSYLVANIA NOTES.

The Carlisle Tire & Rubber Co., Carlisle, Pennsylvania, is building a small addition to its factory.

The Fawcus Machine Co., Pittsburgh, Pennsylvania, has purchased an interest in The Schaffer Engineering & Equipment Co., of which the new officers are: A. F. Cooke, president and general manager; J. C. Schaffer and Eliot A. Kebler, vice-presidents; A. A. Alles, Jr., treasurer; and Waller Crow, secretary.

CONNECTICUT NOTES.

The Goodyear Rubber Company, Middletown, Connecticut, will build a three-story plant, 50 by 216 feet, to cost about $144,000.

The Beacon Falls Rubber Shoe Co., Beacon Falls, Connecticut, has recently let a contract for the building of fifty-four new houses for employes, located on what is known as the "hill." These will be sold on easy terms and are a part of the general plan of the town which the company hopes to make one of the most beautiful in the Naugatuck valley. Forty houses were built four years ago by the company in this same locality and were promptly bought by employes.

The Farrel Foundry & Machine Co., Ansonia, Connecticut, has recently authorized an issue of $1,500,000 preferred stock, of which $1,200,000 has been sold. The common stock of this company has stood at $1,200,000 for a number of years.

THE SEAMLESS RUBBER COMPANY.

THE SEAMLESS RUBBER COMPANY, INC., will soon move from the quarters it has occupied for over forty years into the new $3,000,000 factory it has built on the New Haven waterfront. The business was started in the early seventies of the last century by Charles E. Longden, a young man who had a japanning shop in Naugatuck, Connecticut. An Englishman named Collins interested him in rubber, and the two, finding water power on Longden's farm, began making seamless nipples, sewing machine rings and hollow rubber balls. Having formed a partnership with George Hine, the firm of Hine & Longden started a factory in the town of Naugatuck in 1875 and moved to New Haven two years later, when The Seamless Rubber Company was incorporated with $50,000 capital.

About the time that the United States Rubber Company was being formed, Joseph Banigan became interested in the Seamless company and became president in 1893. Three years later the control passed to George A. Alden and George M. Allerton, the former continuing as president till his death in 1904. Mr. Longden remained as superintendent till 1901. In 1917 the company came into the hands of the present management, and the officers are: F. O. Williams, president; F. W. Dodge, vice-president; W. C. Hutton, treasurer; H. W. Gordon, secretary, and J. W. Patterson, superintendent.

The present plant at Congress avenue and Daggett street, repeatedly enlarged with the company's progress, will be sold.

NEW PLANT OF THE SEAMLESS RUBBER COMPANY, INC., NEW HAVEN, CONNECTICUT.

The new plant is on the waterfront, with the New Haven harbor on one side and the New Haven railroad on the other, thereby securing direct shipment by both water and rail. The plant consists of three five-story buildings connected by one-story buildings, covering an area of 240 by 300 feet; thus providing seventeen floors above ground, 14,400 square feet to each floor, without counting basements and sub-basements. A separate power plant furnishes steam for vulcanizing as well as power, heat and light. The buildings are of concrete, steel and glass; they are fireproof, light and airy. Every piece of machinery and equipment is new and made to order and every modern method known to the rubber industry will be used. The comfort and welfare of the employes, who will number 1,500 in the new plants, have been fully considered as a roof-garden enclosed in glass, will contain a dining room, a dance hall and an auditorium.

The specialty of the Seamless company from the beginning had been medical rubber goods, and the new factory will manufacture soft and hard rubber druggists' sundries, medical and surgical goods, household goods, medicated plasters, hard rubber combs, syringes and specialties; tennis, hand, and squash balls, football bladders and other sporting goods; rubber toys, balloons and novelties; tubings for all purposes; hard and soft rubber goods for the manufacturing and assembling trades; gloves for acid, tanners, surgical, electricians' and general factory work; acid aprons, etc. The factory is the largest in the world for this class of goods and should be in operation July 1.

The Seamless Rubber Co. does a yearly business approaching $2,000,000, and makes goods for the United Drug Co., the Liggett stores, and other drug stores throughout the country.

CANADIAN NOTES.

On April 29, 1920, the directors of Ames Holden McCready Limited, Montreal, Quebec, authorized the incorporation of the Ames Holden McCready Rubber Boot Co., Limited, capitalized at $3,000,000. Light, smart fitting rubbers and rubber-soled canvas shoes will be made at the Mount Royal plant, adjoining the Ames Holden leather footwear plant, and the new factory will feature rubber boots for fishermen, farmers, sportsmen, and miners, as well as overshoes and heavy work rubbers known as lumbermen's. The Mount Royal plant is increasing its daily output to supplement next fall's lines.

The Regal Tire & Rubber Co., Limited, Sherbrooke, Quebec, has purchased an industrial and factory site in that city and is remodeling the building to meet its requirements. It is also purchasing machinery and equipments, the larger contracts for which have already been placed. The company is capitalized at $750,000, half of which is preferred and half common. Robert W. Hogg is secretary and treasurer.

The Tiger Tire & Rubber Company, Limited, 1105 Temple Building, Toronto, Ontario, has purchased the plant and equipment of the Belleville Rubber Co. at Belleville, Ontario, and added enough more equipment to enable it to manufacture 1,000 tires and tubes daily. It expects to begin manufacturing at once. The officers are: R. J. Graham, president, and Colonel L. W. Marsh, vice-president. The directors include, besides, Frank D. Law and W. A. Seward, general manager and consulting engineer, respectively, of the Oak Tire Co., Toronto. H. H. Hastings is manager. The company is capitalized at $2,000,000, of which $750,000 is eight per cent preferred stock and $1,250,000 common.

The Canadian General Electric Co., Limited, Toronto, Ontario, is making extensive additions to its plant at Peterboro, Ontario, including one to the rubber department building, 60 by 100 feet.

Scheuer, Normandin & Co., 18 St. Helen street, Montreal, Quebec, are Canadian distributers for the sporting footwear of the Hood Rubber Co., Watertown, Massachusetts, U. S. A.

The second annual convention of The National Shoe Retailers' Association of Canada and Shoe, Leather and Allied Trades Fair will be held in Montreal, Quebec, July 13-15, 1920. The following are in charge: P. A. Doig, general management; Frank Knowlton, space allotment committee; H. Gibbins, billeting; R. W. Ashcroft, publicity; and George G. Gales, entertainment.

THE RUBBER TRADE IN NEW JERSEY.

By Our Regular Correspondent.

NEWARK NOTES.

THE B. F. GOODRICH RUBBER Co. has leased the three-story and basement building at 13-15 Franklin street, Newark, New Jersey, for branch offices. The building is 53 by 100 feet and has 20,000 square feet of floor space. The first floor will be used as a show room.

Charles Frankel, of Newark, has been appointed receiver for the Ideal Wheel & Tire Co., 148 Sussex avenue, Newark, New Jersey. The receiver will continue the business and effect a reorganization. Application for a receiver was made by Marcus Robbins, holder of fifty shares of stock. Testimony showed that the company lost $12,000 in six months in the conduct of the business. The company's assets exceed its liabilities by a goodly margin.

The hearing on the rule to show cause why an involuntary bankruptcy petition should not be granted in the case of the Indian Tire & Rubber Co., New Brunswick, which was scheduled to be held in the United States District Court at Newark, New Jersey, on May 18, has been postponed indefinitely. In the Chancery Court proceedings in the same case a rule to show cause why an offer of $40,000 from Otto C. Meyer, of Newark, for all the property and assets of the company should not be accepted, is returnable shortly before Vice-Chancellor Foster at Newark.

TRENTON NOTES.

The United Tire Stores Co., of Trenton, has been incorporated under the laws of the state of New Jersey with a capital of $500,000. The company will operate a number of chain stores for the sale of tires and automobile accessories, and will take over the Fineburg Auto Tire Agency and the United Tire Co., both of Trenton, and the stores of the United Tire Co. in New Brunswick, New Jersey; Buffalo, New York; and Scranton, Allentown and Pottsville, Pennsylvania. The incorporators are Isaac Fineburg, Herman Fineburg, Samuel Fineburg and Albert F. Jemison. The principal office of the company is at 10 and 12 East Hanover street, Trenton, with Herman Fineburg in charge.

Earl R. Moore, aged 25 years, cashier of the Acme Rubber Co., Trenton, died recently after a long illness. He is survived by his widow and one son. The interment was in Riegelsville, Pennsylvania.

The Ajax Rubber Co. has purchased the entire plant and premises of the McFarland Foundry & Machine Co., situated at Mead street and Breunig avenue, East Trenton, directly opposite the Ajax works. The property consists of several factory buildings and 55,000 square feet of land. The rubber company recently erected a large addition on one side of Breunig avenue and the present purchase will place it among the largest rubber concerns in this section.

The Trenton rubber companies responded liberally to the drive conducted by the Trenton Welfare Association. General C. Edward Murray, of the Empire Rubber & Tire Corporation, W. J. B. Stokes, of the Thermoid Rubber Co., and George R. Cook, of the Acme Rubber Manufacturing Co., each gave $1,000; the Bergougnan Rubber Corporation and the Home Rubber Co. gave $500 each; the Essex Rubber Co. and Whitehead Brothers

Rubber Co. gave $250 each; the Acme, Hamilton, Luzerne and United & Globe companies gave $200 each, while the Sanhican Rubber Co. and the Woven Steel Hose & Rubber Co. contributed $100 each.

The Pocono Rubber Cloth Co., which recently purchased the plant of the Howard Demountable Rim Co., along the main line of the Pennsylvania Railroad at Trenton, is having erected one of the largest tile signs in the country. The Bergougnan Tire & Rubber Co., situated near the Pocono works, is also having a similar sign erected.

The Bergougnan Rubber Corporation, Trenton, has commenced work on an additional factory unit and a large warehouse for storing raw materials and finished products. Improvements will also be made in the interior arrangement of the present model plant to facilitate economy in manufacture.

The Thermoid Rubber Co., Trenton, announces that its capital stock will be increased from $1,650,000 to $5,000,000 so that the company may increase its plant and expand its business. The company is now building a $500,000 addition to the works on Whitehead's road, to be completed by early fall. It is one unit of what will eventually be an entirely new factory for the concern in which brake linings and other products will be manufactured. W. J. B. Stokes, J. Oliver Stokes, Robert J. Stokes and Fred Wilson are the owners of the Thermoid company.

MISCELLANEOUS NEW JERSEY NOTES.

The Cooper-Hewitt Electric Co. of Hoboken, New Jersey, which was amalgamated with the General Electric Co. last year, has bought land adjoining its plant, which will more than double its floor space. Business has more than doubled.

Hermann Weber, scrap rubber dealer, representing J. Schnurmann, Tottenham, England, has combined his offices, formerly at 30 Church street, New York City, with his warehouse at Newark and Jackson streets, Hoboken, New Jersey, where all correspondence should be addressed in future.

The Reliance Tire & Rubber Co., Keyport, New Jersey, has appointed A. H. McIntyre sales manager.

The Ajax Rubber Company, Trenton, has just begun the construction of a four-story brick addition to the plant to cost $60,000. It is at North Olden and Breunig avenues, and will be 60 by 100 feet. The ground floor will be used for offices and the upper floors as a welfare department for the employes. There will be an assembly room for the men and also a cafeteria. Part of the structure will also be used as a store-room for finished goods awaiting shipment. The firm now employs 1,000 hands and will have employment for many more when the plant is finished.

The pensioned employes of the United States Rubber Co. held a reunion recently as guests of the company in the recreation hall of the New Jersey factory at New Brunswick. The chief features of the occasion were a tour of the plant, a musical program and a supper. Addresses were made by Seymour Hadaway and A. T. Hopkins, of the Central Service Department of the company.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

GENERAL CONDITIONS in Rhode Island rubber manufacturing circles have remained practically unchanged during the last few weeks, all the concerns having good orders ahead and capacity operations being reported. The easing up of the transportation situation has caused the manufacturers less worry during the past month about their supplies of fuel and raw materials.

Wages of the operatives in the rubber factories of the state continue to be a serious problem with the management of the various plants, and not withstanding the fact that the present schedules are more than double the scale ever paid previously, the tendency is still upward with apparently "no limit but the sky" in the estimation of the employes. How much longer this is going to keep the manufacturers on nettles and the workmen unsettled, it is difficult to foretell.

Early in May new schedules went into effect at several of the subsidiary plants of the United States Rubber Co., including the National India Rubber Co. at Bristol, with its 4,500 employes, and the Alice Mill of the Woonsocket Rubber Co. at Woonsocket and the Millville Mill of the same concern, at Millville, having 1,600 and 600 employes, respectively. In this adjustment particular consideration was given to the earnings of employes whose wages were lower than the average, it was stated. This increase, which is the second that has been granted by the corporation in the past six months, adds a considerable amount to the yearly payroll.

Following immediately upon the announcement of this increase in wages came an announcement that the employes of the National plant at Bristol and the two plants of the Woonsocket Rubber Co. will receive a week's vacation without loss of pay this summer. This action, it was stated, was taken as a part of a plan to give, if possible, all employes continuous employment during the entire year. In the past the plants have closed down about two weeks every summer and the employes have received no pay during such periods of idleness. According to the present plans the plants referred to will close July 31 and reopen August 9. Pay for the week's vacation will be given to the workers in the first pay envelope received in August after the vacation period.

One of the outgrowths of the automobile industry is the demand for textile productions for use in the manufacture of tire fabrics. The rapid growth of this branch of the textile industry of this State is plainly indicated by the great expansion that is constantly being made by the corporations engaged in this line of production. Not only are large additions being erected to the cotton manufacturing plants in all sections of Rhode Island, but substantial increases are being made to the capitalization of the concerns. One of the most noticeable of these is the Jenckes Spinning Co. of Pawtucket, which is not only expanding its plant to several times its capacity of a few years ago, but has increased its capitalization from $3,000,000 to $20,000,000. This increase makes the Jenckes Spinning Co. the largest capitalized corporation in Rhode Island engaged in any line of industry. The corporation has now issued common stock to the amount of $2,000,000 and preferred stock to the amount of $4,500,000, leaving a balance of $13,500,000 for later issuance.

Notwithstanding the great expansions that are being made by the textile concerns engaged in fabric production for tire purposes, the production is said to be far from adequate to meet the increasing demands. The shortage in the supply of long staple cotton and the lack of spinning capacity is directly responsible for the present price of tire fabrics. The cotton mills have not been able to keep pace with the tire industry, due to the lack of loom manufacturing during the war and to the unsettled conditions of labor in the cotton centers. Not only were there no looms built during the war but the manufacture of a single loom requires at least a year. The first of these manufactured since the armistice have just come into production and these new ones are relieving those looms worn out by the constant strain of the past fifteen months, which were the heaviest in history. It will be months before the spinning capacity of the mills will be equal to the demand for tire fabrics.

The premises of the Mount Hope Spinning Co., at Warren, Rhode Island, have been the scene of great activity during the last month or six weeks, because of the extensive alterations and additions, as well as other improvements to the plant that are now under way. Although a new mill was finished last summer and another is now approaching completion, the company is

planning another addition to be constructed immediately. This latest addition to the new structure erected last summer in the rear of the original plant will be 70 feet in length and 40 feet wide, two stories high and will connect the new mill now being completed with last summer's annex to the old plant.

The National India Rubber Co., at Bristol, Rhode Island, is steadily shifting its power plant from coal to oil burning, 12 of its 15 large steam boilers having already been so changed. There are, however, five more of the boilers to be connected with the oil supply tank before the whole of the boiler department of the company's plant is fitted for burning oil for fuel purposes. This company is considering the practicability of establishing a branch of its factory at Newport, and a building on Thames street which would be available for the purpose was inspected recently by Mr. Pollock of the National Co.

Several changes have recently occurred among the department heads at the National India Rubber Co., Bristol, Rhode Island, Charles R. Caldwell, foreman of the printing department, has recently resigned and been succeeded by Samuel Simpson.

Harlowe S. Waite has been elected a vice-president and director of the Revere Rubber Co., Providence, in recognition of his many years of faithful and efficient service as factory manager.

The Davol Rubber Co.'s business continues to increase in volume and already the plant has been expanded until all the space available at the present site in Providence has been occupied. The company has recently secured the Simmons building and is to occupy this entire structure as soon as it is vacated and alterations can be made to meet the company's requirements.

The Alice Mill Employes' Association has turned over to the trustees of the Woonsocket Hospital $154.53, the net proceeds of the recent ball given by that association for the benefit of the hospital.

DAVOL SALES AND ADVERTISING MANAGER.

RAYMOND J. FRIES, sales and advertising manager and a member of the executive council of the Davol Rubber Co., Providence, Rhode Island, was born in Trenton, New Jersey, in 1876. After attending the grammar schools and graduating from the high school in New Rochelle, New York, in 1894, he entered the employment of the Kearney & Foot Co., file manufacturers, as stock clerk. Later he became superintendent of the Foot Manufacturing Co., maker of polishing supplies, and then organized the New York Buff Co.

RAYMOND J. FRIES.

It was in 1905 that Mr. Fries first became connected with the rubber industry as stock clerk in the New York City store of The B. F. Goodrich Co., later being promoted to sundries salesman in New York. In 1907, upon the death of H. L. Doherty he went to the Davol Rubber Co. as salesman, and later managed the New York City office of the company until 1917, when he moved to Providence as advertising manager, and was made sales and advertising manager in 1919.

Mr. Fries designed and planned the now well-known line of "Superservice" goods of the Davol company, and made the first use in the sundries trade of the folding or knock-down package for flat goods, now almost universally used.

THE RUBBER TRADE IN MASSACHUSETTS.

By Our Regular Correspondent.

BOSTON NOTES.

TIRE ADJUSTERS from all over New England, representing The B. F. Goodrich Rubber Co., met at the Copley Square Hotel, Boston, recently and discussed methods of standardizing tire adjustments. Frank G. Harrison, Jr., district manager of sales service presided, and devoted much of the morning to instruction. Fred T. Moore, district manager, also spoke. In the afternoon the convention adjourned to the Exeter Theatre, where the delegates viewed "Striking Tires," an amusing cartoon motion picture recently released by the Goodrich company in the interest of tire conservation.

The week of May 17 was observed as "ship by truck" week all over the country. With bands playing and motors chugging, a caravan of nearly fifty motor trucks, including army and navy contingents, made a three-days' run from Boston which covered about 170 miles. The object was to bring to the attention of business men the value of shipping goods by motor truck, particularly in these days when our transportation systems are so badly tied up. The route included Cambridge, Somerville, Chelsea, Revere, Lynn, Salem, Haverhill, Lawrence, Lowell, Worcester and back to Boston. The caravan attracted much attention along the route, especially in the cities visited, where stops were made for addresses of welcome by city officials and talks on the value of motor trucks by some of those on the tour. H. H. Davis, of the Firestone Tire & Rubber Co., was in charge of the tour.

During the recent freight embargo due to striking railroad operatives, the United States Tire Co. and several other rubber firms sent trucks over the road to their factories for tires in order to supply the demands of the Massachusetts territory.

Robert C. Freeman, for several years manager of truck tire sales in the New England district for The B. F. Goodrich Rubber Co., now heads his own concern, the Goodrich Tire Service Co., 66 Broadway, Boston, which is a distributing agency for Goodrich solid and pneumatic truck tires and Diamond pneumatic tires. He has associated with him Nathaniel A. Finkelstein, also an experienced truck tire man, having successfully distributed Goodrich tires in Boston under the firm name of the Commercial Tire Service Co., at 118 Dover street.

V. J. Mulherin, 825 Boylston street, Boston, is New England distributor for Howe tires and tubes.

Guy D. Niles, formerly Boston representative for the Portage Rubber Co. and the Gillette Tire Co., has been appointed manager of the Boston branch of the Lee Rubber & Tire Corporation by Harry E. Field, vice-president and general manager of the latter company. When Mr. Field was vice-president and sales manager of the Hartford Rubber Works Co., ten years ago, Mr. Niles was beginning his career as a tire salesman for that company. A. H. Robinson succeeds Mr. Niles as manager of the Gillette branch.

A. H. McIntyre has resigned as Boston manager of the Fulton Truck Co. to become sales manager of the Reliance Tire & Rubber Co., Keyport, New Jersey. Mr. McIntyre is secretary of the Bay State Automobile Association and one of the best known automobile men in New England. This is the second time within a few months that a rubber company has selected the secretary of this association for a responsible position, his predecessor, W. O. Durrell, having joined the Goodyear forces at Akron a short time ago.

Ellsworth E. Leach, manager of mechanical sales of The B. F. Goodrich Rubber Co., Boston, on May 1, rounded out twenty years of loyal and faithful service and the sales force and department managers of the company remembered the anniversary

by giving a dinner in his honor and presenting him with twenty $20-gold-pieces, one piece for each year of service. Mr. Leach has a very wide acquaintance in the trade among buyers of rubber goods and he has played an important part in guiding the destinies of the Goodrich company in this part of the United States.

The R. W. Harris Tire & Rubber Co., 737 Boylston street, Boston, is agent for Oldfield cord tires in this territory.

V. J. Mulherin, of the Howe Rubber Co., 825 Boylston street, Boston, is in charge of the New England distribution of Howe tires and tubes.

MISCELLANEOUS MASSACHUSETTS NOTES.

The Boston Woven Hose & Rubber Co., Cambridge, has received from the United States Government a distinguished service citation and certificate of merit for its services during the war. In congratulating the employes on the important part played by them in this matter the management emphasizes the importance of continuing the same initiative, energy and industrial productivity in times of peace.

The Boston Woven Hose & Rubber Co., Cambridge, is establishing a self-service cafeteria with a seating capacity of 250 for its employes. A good variety of wholesome food, drinks, smokes and ice cream will be sold without profit.

With eyes open to the gravity of the food situation, the officials of the Monatiquot Rubber Works Co., South Braintree, Massachusetts, have this year placed at the disposal of their employes a good-sized tract of the company's land for gardening purposes. As much interest is being shown in "peace" gardens as was evinced in "war" gardens when America first entered the great conflict. The spirit of rivalry is being encouraged and it is expected that the present enthusiasm will be maintained through the harvest season.

The second "get-together dinner" of the employes of the Tyer Rubber Co. was held at the November Club House, Andover, Massachusetts, on the evening of April 20. The seventy-five employes present were all of the delegates and alternates of the Tyrian Service Committee, the representative committee of the employes; all of the foremen, and the committee members of the management. During the dinner a musical program of songs and orchestral selections was rendered by the Tyrian Mixed Quartette, by soloists from among the membership, and by the Tyer Rubber Company orchestra. Following the dinner, informal remarks were made by several members of the committee, and Mr. Jones, the treasurer and general manager, paid a tribute to Mr. Carlton, the late purchasing agent of the company.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

AKRON NOTES.

THE POPULATION of Akron, the rubber center of the world, has been announced as 208,435 persons, as compared with a population of 69,000 persons ten years ago. This is an increase of 208.1 per cent.

The history of the growth of the city of Akron into the "larger city" class is the history of the rubber industry. For although the city had three sound and growing industries when the automobile industry opened a new field for the rubber products then made in a small way in the city, it was the tire industry which made possible the expansion of the industry which in turn made the city what it is today.

The city grew, however, because it had industrial leaders who were ready to take advantage of the situation. As was pointed out in THE INDIA RUBBER WORLD several months ago, Akron has few natural advantages which should make it the center of the rubber world.

When Dr. B. F. Goodrich came to Akron in 1869, after having failed to organize the rubber industry in the East, the business men of Akron were ready to take a chance and backed him with sufficient capital to erect a 40 by 100-foot shop, in which he began the manufacture of rubber goods.

Although the succeeding years were hard ones, the men who backed him did not lose faith, and when the bicycle wave swept over the country these same and other men were ready to advance a greater capital to make it possible to furnish tires for the bicycles.

When the bicycle tire demand had been met by the rubber industry and no further fields seemed available, came the invention of the automobile and the necessity for rubber tires of larger sizes, and again the business men of the city backed the increased plants and the rubber industry of the city set the pace in the manufacturing of automobile tires. In every instance it was a case of men having faith in their own judgment of the future and being ready to back their judgment with their money.

At the present time the capitalization of the 22 rubber plants in Akron is placed at $227,119,275 by the Chamber of Commerce in official publications, the number of men and women employed in the industry at approximately 75,000, manufacturing $427,796,317 worth of goods a year and having a pay-roll of $101,178,591 a year.

In the history of the development of the city the names of Goodrich, Seiberling, Firestone, Work and Gammeter stand out. The rubber industry is so young that the men who were instrumental in founding the business are still at the helm at the period of its larger expansion.

The future of Akron appears as bright as it did five and ten years ago. Men familiar with its history and prospects do not hesitate to place the ultimate population at 500,000 with the same confidence with which they placed it at 200,000 by 1920 two and three years ago.

The war brought to Akron the beginning of what is considered by rubber men as the next great industry—dirigibles and airplanes.

The manner in which Akron men have taken to the new industry is similar to the manner in which they grasped former opportunities, and if the industry develops as anticipated it will be found in ten years that Akron will be one of the centers of aviation.

A flying club having approximately two hundred members has been organized in the city and efforts will be made to increase this membership. The club is being fostered by the large manufacturers, and a local company has given enough land for a hangar near the city.

John Gammeter, one of Akron's pioneer bird men and head of the experimental department of The B. F. Goodrich Co., is one of the leaders in the new club. Mr. Gammeter was recently elected president of the flying clubs of the state of Ohio at a convention held at Columbus.

The B. F. Goodrich Co. has taken out a building permit for a factory building to cost approximately $400,000. The company now has more than $1,000,000 worth of building under way.

C. D. Studebaker has been appointed district sales manager of The B. F. Goodrich Co. for the Akron territory, which includes Cleveland, Youngstown, Erie and Pittsburgh. Mr. Studebaker started with the company as a New York salesman.

Only six persons wear the Goodrich 25-year service pins. Of the 157 pioneers, 126 wear the 10-year service pin and 26 the 15-year service pin.

The Miller Tire & Rubber Co., Akron, will continue its Americanization classes until the middle of June. Mrs. Louise F. Copp has been appointed plant director of the work in this department and five employes of the company recently received certificates showing that they had completed 75 or

more hours of class work during the last term. Two diplomas have also been awarded to employes.

Edward S. Schlegel, of Youngstown, formerly with the Ohio Industrial Commission, has been named safety manager of The Miller Rubber Co., Akron.

Theodore E. Smith, publisher of "The India Rubber Review," has been elected president of the Rotary Club for the ensuing year.

Major A. G. Stevens, formerly in the highway transportation service of the Council of National Defense, has been made head of the highway transport division of the Goodrich Travel and Transport Bureau, Akron, Ohio, of which Raymond Beck is chief.


MAJOR A. G. STEVENS.

Before entering government service Major Stevens was engaged in railroad tariff compilation and, therefore, he was placed in charge of the section of the finance division of the War Department which issued railroad freight charges. After the war he was assigned to the Council of National Defense to make a comprehensive survey of highway transportation throughout the country. He compiled data showing the comparison between railway, waterway, and highway rates, and obtained reports relating to motor express development and operating costs.

In his present work Major Stevens will correlate all available information on highway transportation, make analyses of engineering features of motor trucking, and issue bulletins containing a digest of all matters of interest.

In order to supply fabric for local rubber mills approximately 500 trucks were hired in the East by Akron rubber factories to bring it over the road from eastern mills. One train, guarded by armed men, brought in 40 cars of fabric. The trucks made the trip at the rate of 100 miles a day and were paid at the rate of $1 a mile.

The Goodyear Tire & Rubber Co. has announced that the factory will work only five days a week because it is impossible to make shipments, due to the railroad situation created by the switchmen's strike.

The Goodyear Tire & Rubber Co. has made an arrangement with the federal postal authorities whereby the Government will move the East Akron post office into a building to be constructed at a cost of $250,000 by the Goodyear company. The building will have 7,000 feet of floor space.

The Goodyear engineering department will soon move into a new five-story building which is now being completed.

Fred Fuller, assistant manager of the labor department of The Goodyear Tire & Rubber Co., was given a desk chair by Goodyear "silents" before he started to Los Angeles to work in the Goodyear plant there. The division heads of the labor department presented him with a loving cup at a dinner tendered him at the City Club recently.

During the third week of May a "ship by truck" tour was conducted by the Firestone Tire & Rubber Co. to the smaller cities and towns near Akron. It was part of the national movement to further the "Ship by Truck Movement."

Although no definite figures are available, safety managers of the various rubber factories here state that accidents were reduced at least 50 per cent during the safety campaign conducted by Akron industries during the week of May 2-9. All the large factories conducted separate campaigns in their plants.

The fact that rubber overshoes and rubbers cannot at present be purchased in Akron retail shoe stores, when they are located in the rubber goods center of the world, is considered as a huge joke.

At the annual meeting of stockholders of The B. F. Goodrich Company, Akron, held March 15, 1920, the following six directors were elected for a term of three years: D. M. Goodrich, New York City; H. Hough, Akron; C. B. Raymond, Akron; H. E. Raymond, New York City; E. C. Shaw, Akron, and F. C. Van Cleef, Akron.

The by-laws were also amended, changing the time of holding the annual meeting of the stockholders from the second Wednesday of March to the third Wednesday of April, beginning in 1921.

At the organization meeting of the directors held immediately after the stockholders' annual meeting on March 15, the following officers were elected for a term of one year: B. G. Work, president and chairman of board of directors; H. E. Raymond, vice-chairman of board of directors; vice-presidents—C. B. Raymond, W. A. Means, H. K. Raymond, W. O. Rutherford, A. B. Jones and W. C. Geer; F. C. Van Cleef, secretary; L. D. Brown, treasurer and assistant secretary; H. Hough, comptroller; H. C. Miller, director, tire sales; C. E. Cook, director, mechanical sales; W. C. Arthur, assistant secretary; V. I. Montenyohl, assistant treasurer, and L. L. Smith, assistant treasurer.

MISCELLANEOUS OHIO NOTES.

W. R. McCarty, who recently assumed the duties of sales manager for The Standard Tire Co., Willoughby, Ohio, maker of "Tiger-Foot" cord tires, has been connected with several of the large tire companies. For a number of years he served as branch manager for such well-known organizations as the Firestone Tire & Rubber Co., The Rubber Products Co. and The Portage Rubber Co. His activities have always been confined to sales, and he is widely known in the trade as an organizer and executive.


W. R. MCCARTY.

Sales of the Mason Tire & Rubber Co., Kent, Ohio, amounted to $1,067,000 during the first three months of 1920. The Mason fabric mill was scheduled to begin operations on May 15.

The Mason Tire & Rubber Co., Kent, Ohio, is making extensive plans for housing the increased number of employes due to the extension of the tire plant and the starting of the cotton fabric mills. One of the plans calls for a group of three units facing a court which will have a fountain, flower beds, trees and shrubbery. There will be twenty-three five-room suites of the duplex type, each being planned to accommodate six or eight girls or a family of four or five. A community hall will give opportunity for social events. The construction is brick, tile and stucco, and the buildings will be heated from a central plant.

The Barr Rubber Products Co., Lorain, Ohio, has recently completed its new factory for the manufacture of toy balloons, bathing caps, etc., and have it fully equipped for production June 1. Nelt Barr, formerly of Ashland, Ohio, now of Lorain, is president and general manager. The other officers are: John Dorn, vice-president; W. H. Adams, secretary and treasurer.

The Lima Rubber Co., Lima, Ohio, changed its name on April 28, 1920, to the Lima Cord Sole & Heel Co. The officers are J. E. Grosjean, president; F. L. Maire, vice-president; F. E. Harman, secretary; and Fred Cook, treasurer. The company manufactures the "Gro-Cord" sole and heel, described elsewhere in this issue.

B. E. Aaronson, special sales representative of the Mohawk Rubber Co., Akron, Ohio, for the last three years, has succeeded M. S. Lines as sales manager of The Gordon Tire & Rubber Co., Canton, Ohio.

On March 31, 1920, The Mason Tire & Rubber Co., Kent, Ohio, absorbed The Mason Cotton Fabrics Co., this now being known as the textile division of the rubber company. The rubber company's estimated sales for the quarter ended April 30 are between $2,000,000 and $2,500,000.

The Mansfield Tire & Rubber Co., Mansfield, Ohio, has elected the following officers for the ensuing year: C. R. Grant, president; G. W. Stephens, first vice-president and general manager; P. H. Ober, second vice-president; J. E. LaDow, secretary; Charles Hoffman, treasurer; and Carl L. Willsey, assistant treasurer. The directors include all of the above and A. J. Reynolds in addition.

The Cincinnati Rubber Manufacturing Co., Cincinnati, Ohio, is building an addition to its factory, 55 by 246 feet, and a further extension is planned. The company recently increased its capital stock to $1,500,000, of which $500,000 is preferred.

The Universal Film Manufacturing Company, New York City, sent out invitations recently to those who might be interested in viewing a series of motion pictures visualizing the production of tires from the raw material to the finished product. The pictures were shown at the Broadway Theatre, 41st street, under the joint auspices of the educational department of the film company and The Goodyear Tire & Rubber Company. The pictures were taken on the Goodyear plantation in Sumatra and in its factory in this country.

John Miller, for the last seven years with The Faultless Rubber Co., Ashland, Ohio, has been appointed factory superintendent of The Barr Rubber Products Co., Lorain, Ohio.

The Ashland Tire & Rubber Co., Ashland, Ohio, is erecting, back of its main factory building a structure 100 by 120 feet for miscellaneous storage, reclaiming plant, and cement room.

The Columbus Tire & Rubber Co., Columbus, Ohio, has recently increased its capital stock to $1,275,000.

The Lima Rubber Co., Lima, Ohio, has changed its name to The Lima Cord Sole Heel Co. The officers are: J. E. Grosjean, president; F. L. Maire, vice-president; F. E. Harman, secretary; and F. W. Cook, treasurer. The company manufactures a cord-fabric sole and heel described elsewhere in this issue.

The Gordon Tire & Rubber Co., Canton, Ohio, has elected the following officers for the ensuing year: H. B. McMaster, president; C. W. Keplinger, vice-president; and C. J. Keplinger, secretary and treasurer. B. E. Aaronson is sales manager and C. E. Jaynes is purchasing agent, while George A. Bockius is equipment engineer.

The plant of The Oak Rubber Co., Ravenna, Ohio, which was totally destroyed by fire on March 15, is being rebuilt to include two units, 40 by 200 feet and 60 to by 200 feet, respectively, and a power unit 40 by feet. The construction is reinforced concrete, and a sprinkler system and special equipment for fighting fires will be installed. The company manufactures dipped rubber specialties and toy balloons. New machinery will be installed so that production may begin in August.

The L. & M. Rubber Co., Carrollton, Ohio, has changed its name to The Tuscan Tire & Rubber Co. and increased its capital to $1,000,000, with the same officers as before, namely: T. J. Saltsman, president; J. H. Richards, secretary; and H. J. Richards, general manager. C. W. McKone and A. W. Senz, formerly with The Gordon Tire & Rubber Co., Canton, Ohio, have become associated with the Tuscan company, Mr. Senz being sales manager. Two lines of tires will be manufactured, the Tuscan which is an air-bag tire in both cord and fabric, and the Buckskin which is a molded tire in fabric and air-bag in cord. The latter is to be for the development of the jobbing trade exclusively.

The Imperial Rubber Co., Orrville, Ohio, has recently been incorporated in that state, at $25,000, to manufacture toy balloons at first and later, rubber sundries and specialties. The concern has purchased the J. D. Mullet Building, on Pine street, until recently occupied by the Glamorgan Rubber Co. The incorators of the new company include Fred F. Flinn, of Ashland; S. S. Hobbs, of Oberlin; H. H. Hoberg, of Ravenna; H. A. Flinn, J. D. Mullett, and Fred S. Gill, of Orrville. H. Hoberg will be general superintendent.

The Cascade Tire & Rubber Co., Ravenna, Ohio, has elected the following officers: Harry C. Thomas, president; E. W. Davis, vice-president; S. G. Abbott, secretary and treasurer.

The Excel Rubber Co., Wadsworth, Ohio, has recently completed its new factory, 112 by 180 feet, two stories in height, with two wings 60 by 40 feet, of brick and steel construction. Machinery is being installed and production will begin at an early date. Three kinds of tires will be made, namely, a high-class fabric tire, a high-class cord tire, and a medium-priced tire, as well as accessories.

The Master Tire & Rubber Co., Dayton Ohio, has increased its capitalization from $300,000 to $1,000,000 in order to erect a six-story building to increase its capacity to 2,000 tires daily.

The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio, has elected the following new officers: E. C. McGraw, president; John Morgan, vice-president and treasurer; R. W. McGraw, vice-president; L. M. Kyes, secretary; and H. C. Johnston, assistant secretary.

The Reynolds Machine Co., Massillon, Ohio, has appointed Frank B. Longnaker general supervisor of its tire mold, core, and rubber mill equipment department which it has recently established. Mr. Longnaker was formerly general superintendent and sales manager of The Banner Machine Co., Columbiana, Ohio, manufacturer of tire molds and equipment, and also with The Goodyear Tire & Rubber Co., Akron, for eight years, in charge of its machine shop.

CLEVELAND NOTES.

The Malay Rubber Co., 1034 Guardian Building, Cleveland, has been organized to manufacture Malay tires. The officers are: Charles L. Blatz, president; Owen Moynihan, vice-president and general manager; R. L. Queisser, treasurer; and E. E. Sprague, secretary.

The Ideal Tire & Rubber Co., Cleveland, will increase its output of Greyhound tires to 300 a day, beginning June 1.

The India Tire & Rubber Co., Akron, has opened a branch at 65th street and Carnegie avenue, Cleveland, Ohio, in charge of Ode Russ.

The Wellman-Seaver-Morgan Co., manufacturer of rubber factory equipment and special machinery, on March 31 removed its Akron office in charge of L. N. Ridenour to its general offices at 7000 Central avenue, Cleveland.

The Ætna Rubber Co., 811-815 East 79th street, Cleveland, is specializing on hard rubber molded goods for batteries. The company has recently been reorganized and the capital stock increased to $300,000. A factory addition is planned in which additional machinery will give the concern three times its present production.

The D. & M. Cord Tire Co., Cleveland, has changed its name to The Denman-Myers Cord Tire Co. Walter R. Denman is secretary and general manager.

"The Rubber Age and Tire News" and "Tire Trade Journal," New York City, have established an office at No. 828 The National City Building, Cleveland, in care of F. H. Van Horn.

THE RUBBER TRADE IN THE MID-WEST.

By Our Regular Correspondent.

MID-WEST RUBBER MANUFACTURERS' ASSOCIATION.

THE MAY MEETING of the Mid-West Rubber Manufacturers' Association was held on the 11th of last month at the Chicago Athletic Club with sixty members present. The following new members were admitted:

REGULAR MEMBERS.

The Sebring Tire & Rubber Co., Sebring, Ohio.
The Carey Tire & Rubber Co., Carey, Ohio.
The Monarch Rubber Co., Canton, Ohio.
The Porter Rubber Co., Salem, Ohio.
The Knox Tire & Rubber Co., Mount Vernon, Ohio.
Ardmore-Akron Tire & Rubber Co., Oklahoma City, Oklahoma.

ASSOCIATE MEMBERS.

Allen Machine Co., Erie, Pennsylvania.
Wishnick-Tumpeer Chemical Co., Chicago, Illinois.
The Barrett Co., Chicago, Illinois.
"The Tire Rate Book," New York City.
H. A. Astlett & Co., New York City.
Bankers' Audit & Appraisal Co., Chicago, Illinois.

Last month the Association sent out a good deal of literature to its members for their guidance and information, notably: a weekly review of the crude rubber market; lists of articles and material wanted or for sale; reports on special subjects, like the coal situation; and notification of important news, as the meeting of the Reserve Board directors to consider the restriction of credits.

MID-WEST NOTES.

After being located 27 years at 160 West Jackson Boulevard, Chicago, Illinois, A. W. Smith, western representative of the Goodyear's India Rubber Glove Division of the United States Rubber Co., has removed to Room 917, 115 South Dearborn street.

The Chicago branch of the Star Rubber Co., Akron, Ohio, is in charge of E. A. Peterson.

The J. W. P. Tire Co. has been organized at Scottsburg, Indiana, with W. L. Hubbard as president, to manufacture a pneumatic tire. The company expects to build a factory soon.

The Zonta Tire & Rubber Co., 404 Iowa Building, Sioux City, Iowa, has begun the construction of a $350,000 plant at 3100 Floyd avenue, Sioux City, where it is expected to begin manufacturing about October 1 of the present year. The officers of the company are: T. P. Scott, president; Fred Bartelt, vice-president; H. W. Caldwell, secretary, and F. J. Simmons, treasurer.

The Pawnee Tire & Rubber Co., Waterloo, Iowa, which was incorporated under the laws of the State on July 18, 1919, with $1,000,000 eight per cent cumulative participating capital and $500,000 common, has recently purchased a building at Cedar Falls, containing 36,000 square feet of operating floor space, besides a two and one-half-story office building and two two-story storage buildings, and plans to begin manufacturing in the autumn. The officers of the company are: E. D. Flynn, president; Charles F. Sawyer, vice-president and general manager; William J. Murphy, treasurer; and E. J. Murphy, secretary. These, with E. D. Flynn, Jr., also compose the board of directors.

The W. A. Shaeffer Pen Co., Fort Madison, Iowa, manufacturer of fountain pens, etc., has increased its capital stock from $1,500,000 common and $75,000 preferred to $1,500,000 common and $2,500,000 preferred, making a total of $4,000,000.

The factories of the Wildman Rubber Co. will be located at Bay City, Michigan, where it has acquired 63 acres of land with a frontage of half a mile on the Saginaw river and its deep water channel. The Michigan Central and Grand Trunk railroads run through the property and electric power is available from the plants of the Commonwealth Power on the Au Sable river and other sources. A modern factory will be erected here and the first unit will be capable of turning out 2,500 tires and 5,000 tubes daily. W. W. Wildman, Detroit, who has had nearly a quarter of a century of experience in the rubber business, is president and general manager; L. C. MacGregor is vice-president; and C. R. Twynham is secretary-treasurer. All three were formerly with the Portage Rubber Co., Akron, Ohio. The office of the Wildman company is at 817 Book Building, Detroit, Michigan.

The Ajax Rubber Co., Inc., New York City, has appointed L. M. Van Riper district manager with headquarters in Detroit, Michigan. His territory includes a considerable portion of northern Ohio.

The Curtis Tire & Rubber Co.'s plant at Muskegon, Michigan, was entirely destroyed by fire last month.

A. G. Spalding & Bros., sporting goods dealers, have removed from 415 North Seventh street, St. Louis, Missouri, to 823 Locust street, opposite the downtown postoffice, in the shopping district.

At the annual meeting of the stockholders of the Premier Tire & Rubber Co., Kansas City, Missouri, the following directors were elected: J. G. Joce, Carter Wilder, C. R. Renolds, A. J. Woodring, C. A. Wooley, Walter Maloney, and B. J. Riser. The capital stock was also increased from $300,000 to $1,500,000 and a stock dividend of 100 per cent declared on all outstanding stock. The company is now building 50,000 square feet of floor space.

The Surety Tire & Rubber Co., St. Louis, Missouri, is perfecting plans for the production of 1,000 Sternwear casings daily. William L. Burgess is vice-president and general manager.

The Rawlings Manufacturing Co., St. Louis, Missouri, manufacturer of game balls, has leased the two-story building at the northwest corner of Twentieth and Locust streets for two years, and will occupy the premises temporarily until the completion of the addition to its factory on a 50-foot lot west of the present factory on Lucas avenue. W. P. Whitley is vice-president and general manager.

The Overland Tire & Rubber Co., Omaha, Nebraska, has promoted F. C. Rudisell from the position of secretary and sales manager to that of general manager.

The Black & Decker Manufacturing Co., Towson Heights, Baltimore, Maryland, has established a permanent office and show room for the display of its portable electric tools and special machinery at 1436 South Michigan avenue, Chicago, in charge of R. G. Ames, whose territory will include the entire Mid-West. He will be assisted by F. E. Marrion and J. N. LaBelle.

The Stanwood Rubber Co., 9 East 40th street, New York City, and Elizabeth, New Jersey, has opened a Chicago office at 1712 South Michigan avenue, in charge of J. H. Greer, who is district manager of both the Stanwood company and of the Hardman Tire & Rubber Corporation, Belleville, New Jersey.

The Zeglen Tire & Rubber Co., Inc., 118 North La Salle street, Chicago, Illinois, a newly incorporated company, has purchased the plant of the Century Rubber Works at Elston and Rawson streets, Chicago, and expects to start producing a one-ply interwoven tire under its own patents about July 1. John B. Drish is acting president and vice-president and Frank J. Kolodzinski is secretary and treasurer.

The Burdick Tire & Rubber Co., Chicago, Illinois, has removed from the Consumers' Company Building to 10 South La Salle street. The present officers are: Henry G. Steinbrenner,

president; Frank E. Teachout, vice-president and general manager; and Harlow P. Steinbrenner, secretary and treasurer. The new factory of the company at Noblesville, Indiana, is of reinforced concrete throughout and has a floor space of 66,000 square feet. It is three stories high.

The Sewell Cushion Wheel Co., Detroit, Michigan, has purchased property at 2711-2717 South Wabash avenue, Chicago, 80 by 190 feet, on which it will erect a one-story building with a foundation to carry a second story. A portion of this structure will be used for Chicago service and the balance for manufacturing and assembling. The total investment, including machinery, will be $75,000.

At the annual meeting of the American Zinc Institute, in Chicago, where Charles M. Schwab, who has become interested in zinc, was a speaker, the following officers were elected for the ensuing year: president, E. H. Wolff, of the Illinois Zinc Co., Peru, Illinois; first vice-president, J. L. Bruce, of the Daly Travis Copper Co., Butte, Montana; second vice-president, Edgar Palmer, of the New Jersey Zinc Co., Inc., New York; third vice-president, F. C. Wallower, of Joplin, Missouri. The next meeting will be held in St. Louis.

The National Association of Waste Material Dealers, Inc., notifies its members that the classifications covering rubber expire July 1, and new ones become effective for one year from that date. Members are requested to notify the secretary of any changes they wish to have considered at the June meetings.

The Wishnick-Tumpeer Chemical Co., North Pier Terminal, 365 East Illinois street, Chicago, was incorporated May 4, 1920, under the laws of that State, with a capitalization of $100,000, to conduct a business as importer of and dealer in chemicals, oils and colors, specializing in rubber compounding ingredients. Stocks of standardized materials will be carried for the convenience of rubber manufacturers in the West and Mid-West. The officers are: Robert I. Wishnick, president and treasurer; Julius Tumpeer, vice-president; David Tumpeer, secretary. The company will be able to handle carload shipments on its own private switch and make freight shipments direct from its terminal through the tunnel system.

Reichel & Drews, formerly at 559 West Lake street, Chicago, Illinois, manufacturers of fabric-cutting machinery, have removed to their new factory at 452-456 North Ashland avenue, Chicago.

Thomas E. Wilson & Co., Chicago, Illinois, sporting goods manufacturer, has taken over the Chicago Sporting Goods Manufacturing Co. Fred J. Ratsch, formerly the head of the latter concern, will be director of the jobbers' division of the Wilson company. The large new factory Mr. Ratsch was building at Powell and Charleston streets, included in the transaction, will give the Wilson company 100,000 additional square feet of manufacturing space.

O. E. Truesdell has been appointed district manufacturers' representative for the Firestone Steel Products Co., Akron, with headquarters in Indianapolis. He will take over portions of the territory heretofore handled by L. W. Enos and A. B. Droeger from Chicago and Detroit, respectively.

The Double Fabric Tire Co., Auburn, Indiana, maker of Auburn tires and tubes, attaches a tag stating the percentage of pure Pará rubber used in each Aubnrn certified tire.

The International India Rubber Corporation, South Bend, Indiana, has appointed F. A. Rendon manager of its export department. He was formerly with the Pirelli Company, Italy, and the Lee Rubber & Tire Corporation, New York City.

The Quality Tire & Rubber Co., Anderson, Indiana, recently absorbed by The Long-Wear Tire & Rubber Co., has reduced its capital stock from $4,700,000 to $4,150,000 common, and $500,000 second preferred has been created.

The Fort Wayne Tire & Rubber Manufacturing Co., Fort Wayne, Indiana, has increased its capital from $1,000,000 to $2,500,000. J. C. Brown is president of the company.

THE RUBBER TRADE ON THE PACIFIC COAST.

By Our Regular Correspondent.

LOS ANGELES NOTES.

The Pacific Coast début of the rubber bathing suit, the rubber beach cloak, and the rubber bathing hat was made but a fortnight ago in Los Angeles. That these newest styles struck popular fancy was evidenced by the admiring comments made among the forty thousand people who viewed these novel costumes at the Venice beach parade held on May 16.

Some 300 attractive girls, many of them noted screen stars from the nearby Hollywood film studios, were the primary attraction. They were garbed in every conceivable kind of modish garments suitable for actual and near-bathing; and while most of the cloth creations worn were undeniably pleasing to the eye and some of them strikingly artistic, the rubber novelties made a distinct hit. The general verdict was that they would have been equally appreciated even though they were not displayed by rather pretty mermaids.

The United States Rubber Co., which had a short time before shown the hats, capes and suits on living models at the Hotel Alexandria, Los Angeles, to buyers from many stores, had a special rubber exhibit. The advantages of the all-rubber bathing suit are that it quickly sheds water, dries in a few moments, and, unlike the damp cloth garments, can be carried about comfortably. There is a promising field for rubber bathing apparel on the Pacific Coast, as the mild climate permits bathing practically the year around on its numerous fine beaches.

The West American Rubber Co., 400-432 North Avenue 19, Los Angeles, announces the appointment of C. Lamb as superintendent. Mr. Lamb was formerly connected with the Cincinnati Rubber Manufacturing Co., Cincinnati, Ohio.

Another big tire factory may soon be established in Los Angeles to serve the West Coast trade. Preston E. Roberts, president and general manager of the Perfection Tire & Rubber Co., Fort Madison, Iowa, has been in Southern California in conference with Guasti, House & Guilli, Inc., and W. L. Bartlett, distributers of Perfection tires. In order to overcome the transportation handicap between the Mid-West and the Coast, and to expedite distribution, Mr. Roberts feels that a factory here is indispensible.

The Goodyear Tire & Rubber Co. recently broke all records of the Los Angeles Chamber of Commerce by applying for 100 memberships for members of its new factory force, and bringing the roster of the local trade board up to the 6,200 mark.

The Goodyear company has, through its subsidiary, the Southwest Cotton Co., acquired the 7,000-acre Marienette ranch of R. P. Davie to add to its 25,000-acre holdings of prime cotton-growing land in Arizona. The price of the 7,000 acres is put at $1,000,000. Pima cotton grown here has brought as high as $1.25 a pound on a $19,000 purchase. A dollar a pound is guaranteed to growers on the next crop.

Work has been started at El Segundo, a beach town close to Los Angeles, on a $2,000,000 plant for the General Chemical Co., New York City.

Practically all the leading tire makers and jobbers of Los Angeles are members of the recently reorganized Automobile Tire Manufacturers' and Jobbers' Association, of which Frank R. Price, of Nelson & Price, is president. The association will

strive to correct abuses in the tire trade, establish selling standards, and promote the interests of its members in every reasonable way.

Ernest E. Gagnon, of the Seal-It Company of New York, has been perfecting plans here for a factory to make the company's puncture cure compound. The Los Angeles factory will be the company's third, it already having two in the East.

The Fordtire & Rubber Co., Fort Worth, Texas, is planning to build a factory in Los Angeles. The company specializes on a puncture-proof process for tires, now licensed to repair men. E. A. Boyle, 517 East Ninth street, is California state manager.

The Los Angeles Pacific Navigation Line, a new company, announces that it will put on a line of vessels, running directly between Los Angeles and Singapore and the Far East. One main object is to supply the rubber factories which are being built in and near Los Angeles. It has established branch offices at Manila, Kobe, Hongkong and Shanghai, also.

George T. Bell, head of the Bell Rubber Co., started in the tire business in his native city, St. Louis, ten years ago, and moved a few years later to Akron, Ohio, where his plant now covers a city block and its output is over 100 solid tires a day. He is also head of the Tire Construction Co., West Pico and Olive streets, Los Angeles, with fine tire salesrooms, and is reputed to do the largest tire repair business on the Coast, employing forty vulcanizers.

One of the first men in the trade to develop rubber specialities on a large and varied scale for the motion picture industry in the Southwest is Douglas R. Radford, president of the West American Rubber Company, Los Angeles.


Douglas R. Radford.

Born in London, England, in 1883, he studied engineering and qualified at the age of twenty for the position of assistant engineer of a tea plantation in Burma, India, but just as he was about to leave for the Far East the company changed its plans and left him without an engagement. He then decided to go West and take up ranching in California, but after a few months there he was called home on account of family illness and spent another year in London. The lure of the West, however, was too strong for him to resist, and he returned to Los Angeles in 1907. After working for three years at "everything from Secret Service to bridge-building," he accepted the task of putting the West American Rubber Company on its feet. In this work he has been ably aided by the secretary, C. R. Prentiss, also an engineer, and the concern has made gratifying progress. Recently the company strengthened its working force, installed more machinery, and is making plans for a large addition to the plant.

The company has been making rubber supplies for oil wells and various patented novelties, but is also branching out into other lines.

The rush of big rubber men to secure cotton acreage and cotton itself is over until next fall. All of the large tire interests have been in evidence here this year. The Seiverlings, the Fisk company, the United States Rubber Co., the Firestone company, The Miller Rubber Co., and others have been and gone and the long staple crop is presumably buttoned up.

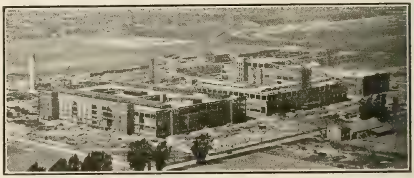
J. B. Magee, manager of the United States Rubber Company's branches in southern California and Arizona, is accounted one of the most energetic trade developers in the Southwest. He made his début in the rubber business eight years ago, when he became a statistical clerk in the office of the United States Rubber Company in San Francisco. His executive ability was soon recognized and he was repeatedly promoted, and finally put in charge of the Phoenix branch. On January 1, 1916, he was appointed to his present position, and at once began to organize an efficient sales force. That he made capable selections and infused into his lieutenants much of his own enthusiasm and fidelity is amply attested by the steady and considerable growth of the company's business in the territory allotted to him. To his aides Mr. Magee generously gives the major share of the credit for his success. His main office is at 923 South Los Angeles street, Los Angeles, and the line includes everything manufactured by the big concern he represents.


J. B. Magee.

F. F. Schaffer, president of Goodyear's India Rubber Glove Manufacturing Co., and Arthur Reeve, assistant general manager, footwear division of the United States Rubber Co., have just visited the Pacific Coast, including Los Angeles, San Diego, and San Francisco, as well as the Grand Cañon.

GOODYEAR'S CALIFORNIA PLANT NEARING COMPLETION.

This illustration is from a photograph, taken from an airplane, of the buildings and grounds of the Goodyear Tire & Rubber Company of California, at Ascot Park, Los Angeles, as they are now, a year after ground was broken. A bit of Los Angeles shows in the background. The picture may be compared with that of the projected plant in The India Rubber World, August 1, 1919.


Aeroview of Goodyear Plant, Los Angeles, California.

SAN FRANCISCO NOTES.

At the World Metric Standardization Conference at the Palace Hotel the delegates to the Seventh National Foreign Trade Convention, just before departing, heard with much interest an address by Burgess Darrow, of the technical division of The Goodyear Tire & Rubber Co. of Akron, Ohio, on the reasons why his company has decided to adopt the metric measurements exclusively in not only marking sizes on tires, but also in calculation, construction, and in operation throughout the parent plant and the new branch concern being started in Los Angeles.

Tire makers have been invited to enter tests of non-skid products at the annual convention of the National Traffic Officers' Convention to be held here in August. A committee of members of the Advertising Clubs of America will act as judges with traffic officers from many cities in the Union. The streets in front of the Auditorium, where the convention will be held, will be made as wet as possible and the cars competing must be able

to stop quickly according to rigorous rules. A severe test will also be made of brake linings.

Frazar & Company, New York City, crude rubber importers and exporters, have opened an office in the First National Bank Building, San Francisco, to provide further facilities for Pacific Coast exports and imports. They already have an office in the New York Building, Seattle, Washington.

The Pacific Mail Steamship line runs two steamers regularly between San Francisco and Calcutta, via Singapore, and seven steamers handed over by the United States Shipping Board are conveying cargo between Shangai and Calcutta and acting as feeders for the trans-Pacific lines. Two American companies, the Robert Dollar and the Independent steamship companies, which have maintained a freight service in the East for some time, are adding to the shipping facilities between Singapore and the United States.

The Coast Tire and Rubber Company, 408-409 Syndicate building, Oakland, California, has secured a six-acre site in that city, where it will establish its new tire plant. The main building will be 72 by 360 feet, and the other buildings will include steam plant, machine shop and offices. The company was incorporated August 29, 1919, and the officers are: Holmes Ives, president; John I. Pankratz, vice-president; N. B. Campbell, treasurer, and W. D. Forbes, secretary. In addition to the above, the directors include Harold Giesse, Roy Thorpe, N. J. Whelan, A. L. Warmington and Francis H. Woodward. E. Lawthorn, formerly factory superintendent for the Federal Rubber Co., Cudahy, Wisconsin, and for the Gillette Rubber Co., Eau Claire, Wisconsin, is factory superintendent.

H. W. McKevitt, head of the McKevitt Auto Supply Co., has been appointed retail distributer of Lee tires in San Francisco.

SAN DIEGO NOTES.

H. S. Firestone, president of the Firestone Tire & Rubber Co., with his sons, Leonard and Raymond, and Barney Oldfield, were guests of friends in San Diego recently. Mr. Firestone has been making an automobile tour of Imperial Valley, and has been urging the farmers there to raise more long-staple cotton, for which there is a great demand among tire manufacturers. The Firestone concern is a heavy buyer of raw cotton and has several gins in the valley.

Credit for making the first pneumatic tire west of Chicago is claimed by the Savage Tire Co., which produced a perfect casing in 1912 at its factory in San Diego, and since that time the business has grown extensively on the Pacific Coast. John D. Spreckels, the sugar magnate, is said to hold controlling interest in the concern, which, since the first of February, has become known as The Spreckels "Savage" Tire Co., having purchased the assets of the Savage Tire Co. and the Savage Tire Corporation, both of San Diego. Plans are being made for a large extension to the plant which will give it a 100 per cent increase in production. The company will soon start to build a steel and concrete storehouse with a capacity for 70,000 tires. It will be seventy-five by six hundred and sixty feet with ten doors at which to load and unload freight cars. A three-day spring meeting of West and Southwest branch managers was held last month at the plant.

NORTHWESTERN NOTES.

Fred S. Wilson, vice-president and Pacific Coast representative of the Thermoid Rubber Co., Trenton, New Jersey, has been in Portland looking over trade conditions with the Allen & Hebard Co., local distributer of Thermoid tires.

The Oregon agency for Overman solid cushion tires in Portland has been taken by the Howell-Swift Tire Company, which handles Canton cord and Blackstone tires in this section.

E. B. Conlee, western representative of the Stanwood Rubber Co., Elizabeth, New Jersey, has been busy during the past few weeks establishing agencies for Stanwood tires in Spokane, Seattle, Portland, San Francisco, Fresno and Los Angeles.

Clyde S. Thompson, advertising manager for the Portage Tire & Rubber Co., Akron, Ohio, is studying trade conditions on the Coast.

A recent estimate puts the number of motor trucks in use in the seven states west of the Rocky Mountains as 110,000, California leading with 58,700.

SOUTHWESTERN NOTES.

A hangar for the dirigible balloon of the Goodyear Tire & Rubber Co., known as the pony blimp, is being erected at Litchfield, Arizona, where plantations of the Southwest Cotton Company, a subsidiary of the Goodyear concern, are located. The blimp will be used by the Goodyear company in messenger service between the cotton fields in Arizona and the new Goodyear factory in Los Angeles, with an intermediate stop at Blythe, California. It is 95 feet long, carries two persons, and is capable of a speed of 40 miles an hour for ten hours.

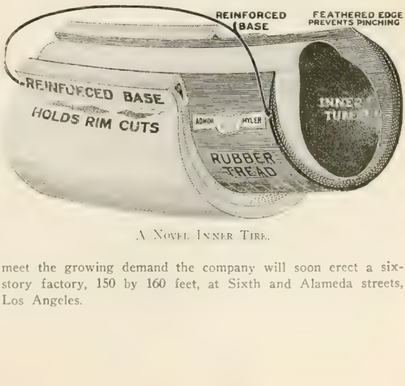
A new and larger supply station for the distribution of Miller tires in San Diego and Imperial counties has been established at Fourth and B streets, San Diego. F. C. Millhoff, general sales manager of the Miller company, has been a recent visitor in Southern California.

The Imperial Valley Cotton Growers' Association of California, which from 120,000 acres supplies cotton for tire fabrics, has petitioned the Federal Government for the admission of 2,000 Mexican laborers to handle the 1920 crop, on account of the great scarcity of American labor. At the end of the season the aliens would be sent back over the border line. Imperial Valley bankers will finance the plan.

Wayne Murray and George S. Danaher, doing business as Murray & Danaher, have become the agents for the Swinehart tires in the Southwest, covering the states of Texas, Oklahoma, New Mexico, Louisiana, and Arkansas. Both were in the government motor service during the war and have had long experience in the automobile business. Their office is at 506 Trust building, Dallas, Texas.

THE AD-MOR-MYLER INNER TUBE.

This is a special inner sole tire which, it is claimed, overcomes all the drawbacks of many such tire-saving devices now on the market. This supplemental tire is designed to save inner tubes from punctures, and can be transferred when the casing is worn out to a new one. A double rubber bead is used to strengthen the tire, take the strain off the rim edge, and, it is said, makes rim blow-outs almost impossible. The edge is feathered to prevent pinching in the casing. This inner sole tire is produced by the Ad-Mor-Myler Rubber Company, a recently incorporated Delaware corporation; capitalized for $1,000,000. Its president and founder is A. Jacquins. Henry Josephs is sales manager. To



A NOVEL INNER TIRE.

meet the growing demand the company will soon erect a six-story factory, 150 by 160 feet, at Sixth and Alameda streets, Los Angeles.

The Rubber Trade in Great Britain.

By Our Regular Correspondent.

THE TWO TOPICS about which one hears most at the time of writing are the favorable position of the raw rubber market—that is, for the manufacturers—and the budget with its increase of the excess profits duty from 40 to 60 per cent and the limited company profits tax of one shilling on the pound. This latter tax will no doubt be the eventual permanent form of the temporary excess profits duty, and its present imposition is in order to get at the undivided profit put to reserve and afterwards distributed in the form of bonus shares. It cannot be denied that our manufacturers generally are doing much better than was expected, owing to the dearth of goods in many countries, but they complain that the new taxes will have a most injurious effect upon trade, as the large profits are required to provide the extra working capital needed on account of the increased prices being paid for practically everything. Perhaps this statement should be taken with the proverbial grain of salt, but to my mind the real trouble lies in the not too distant future when European production of goods approaches the pre-war standard and we have to meet serious competition with our high wages bill and reduced output due to shorter hours of work.

The present dullness in the rubber share market must be attributed to the price of the commodity rather than to the new excess profits duty, for although the newer companies are hard hit by this tax, it is confidently expected that in 1922 demand will overtake supply, with financial results that will more than make up for any temporary setback in dividends. On this point we must wait with all the patience we can command to see if the prediction comes true.

WOMEN IN RUBBER MILLS.

In further reference to some remarks in the April issue of THE INDIA RUBBER WORLD on the increased employment of women in rubber factories, the position here, speaking generally, is that the women taken on to replace men who were called up for service in the war have been displaced by the latter on their return. In those cases where the men have unfortunately not returned or have preferred to take up some other occupation, the women have remained at their new work where this has been satisfactorily performed. Thus one can still see women engaged at mixing rolls, spreading machines, etc., work in which they did not participate before the war, and this in the smaller concerns where the nurse, the rest room and hot coffee have not yet made their appearance.

The cotton mill boom appears to have almost spent itself, and the trade is now threatened with a general strike of the operatives for a larger share in its emoluments. There is hope that the matter may be amicably settled, but the price of fabric is going to continue a source of anxiety to those in the rubber trade who use it extensively.

CELLULOSE IN RUBBER.

The authors of the analytical method for determining the amount of cellulose in rubber goods have rightly drawn attention to the fact that a wide search for various substances is essential if the determination of rubber by difference is to be taken as accurate. Except in such cases as fiber boot soles and one or two other instances where the cellulose is present in fairly large amount as a normal constituent, it seems unlikely that the somewhat tedious method worked out will be a matter of common application. When referring to experimental or analytical work on reclaimed rubber the latter ought to be fully described, as its variations are so great. In rubber reclaimed by the mechanical method, no doubt the little cellulose left would be in the form of the original cotton, while in an alkali reclaim it would be there, if at all, as oxy-cellulose, and it may be that the acetylation method will not prove satisfactory in the latter case. It is doubtful whether the cellulose determination as an index to the presence or absence of reclaimed rubber in a mixing will be found as reliable as the other indirect methods which have preceded it.

THE RESEARCH ASSOCIATION OF BRITISH RUBBER AND TIRE MANUFACTURERS.

The appointment of D. B. Porritt, chief chemist of the North British Rubber Co., Limited, to the post of director of research has been received by the trade generally with approbation, and with particular satisfaction by his personal acquaintances. He combines academic distinction with that practical knowledge which can be acquired only by many years of close association with manufacturing, and the field in which such associated qualifications are to be met with is by no means a large one. This does not imply that the task of the selection committee was devoid of all difficulty, but it is clear to outsiders intimately acquainted with the trade that if there were hundreds of applicants for the advertised post it would be a very simple matter to reduce them to a round dozen.

It is rumored that the work, which at first will be on somewhat modest lines, will take place in London, though the actual spot has not yet been announced—perhaps it has not yet been decided upon. The main activities of the Research Association, it is understood, will be concerned essentially with fundamental problems rather than with works difficulties and this is as it should be, seeing that half the money is put up by the taxpayers who, it appears, are not to be favored with details of the discoveries made or work carried out. Speaking of research associations generally which are now in progress of formation for various industries and not specially of what may happen in the association under notice, calls to mind the position of affairs which led to complaints against the National Physical Laboratory a year or two after its foundation when a good deal of routine work ordinarily undertaken by professional analysts was being done. The interesting announcement is made that the committee in control of the work intends, if it seems desirable, to secure the services of independent rubber chemists to assist in special work.

THE PROOFING TRADE.

It is a sign of the progress that America has made during the war period that the present demands of Canada are being so largely met from the States instead of from Great Britain, as was formerly the case. This defection is not a matter of great concern at the moment because proofers have plenty of work on their hands, but all the same, efforts will doubtless be put forth to regain the lost trade. Other countries, which in normal times would be doing more proofing on their own, are held up by a shortage of cloth, a point which is all in favor of our export trade. It rained steadily all April, which encouraged the mackintosh as against the mere raincoat, an article which appears to be losing some of its former popularity. It seems to have come home to many purchasers that this latter is a nice looking comfortable sort of garment for fine weather or for wet weather if you have an umbrella with you.

It comes somewhat as a shock to hear that Vickers, Limited, the armament firm of Sheffield, is going into the waterproof garment trade at its Dartford Works. It is common knowledge that the firm controls the cable works of W. T. Glover & Co., Limited, of Manchester, but it is not widely known that it is the proprietor of the Ioco Proofing Co., Limited, of Anniesland, Glasgow, where a large amount of airship material was proofed

during the war. The firm is also understood to be interested in bakelite synthetic resin manufacture.

The Monarch Rubber Co., Limited, of Bradford Road, Manchester, proofers to the trade, are engaged in fitting up more extensive new premises at Miles Platting, a mile or so away, and the Monarch Waterproof Co., Limited, which does the making-up side of the business, will also be moving shortly from its present address in Cheetham, Manchester, to more commodious premises in Lower Broughton Lane, Manchester.

To commemorate its Silver Jubilee the waterproofing firm of Ferguson, Shiers & Co., Limited, has issued an illustrated souvenir giving details of the work and machinery.

Rubber proofing is carried on at Phoenix Mills, Failsworth, Manchester, and rainproofing at Blossom Mills, Strangeways, Manchester. Interest attaches mainly to the large new mill erected at the Failsworth Works during the war, which for certain reasons was taken over on completion by a new company, in which Messrs. Frankenburg were largely interested, to do a certain class of work for the Government. As the armistice was signed shortly after the formation of the company, this work was never entered upon and the new mill has now reverted to Ferguson, Shiers & Co., Limited. The building, which is well planned with lofty work rooms, contains 15 mixing machines and 36 spreading machines and embodies all the latest conveniences for dealing with large quantities of single and double-texture proofing in a hygienic manner, the ventilation system having been designed to meet the latest requirements of the Dangerous Trades Department of the Home Office. This firm is quite distinct from that of A. O. Ferguson & Co., Limited, which is located a mile or two away and which was founded some years ago by the son of G. E. Ferguson, the late senior partner of Ferguson, Shiers & Co., Limited.

Worries incidental to labor, mainly with regard to remuneration, are a somewhat warm theme, but of late a new sort of labor worry has made itself felt. This is concerned with the action taken by men's unions in cases where individuals are inclined to grumble about their accouterments. To take a concrete case, the railway companies fit out their servants with mackintoshes, usually blue or black shades for station masters and porters, and stout drill khaki ones for those engaged in rough work, like shunters. Whereas ten years ago complaints were practically unknown, some workman, who may possibly have misused his garment, makes a fuss about its inferiority and his union takes the matter up and starts correspondence with the officials, who pass the complaint on to the manufacturers.

RUBBER SPONGES.

The recent Drapery and Textile Exhibition, held in London in April, was not remarkable for its rubber exhibits, though a word or two may be said about the sponge display of the Sorbo Rubber Sponge Products, Limited. This business, which is carried on in London to work a process of G. Leeson, late of Manchester, has met with considerable success in the sale of its yellow natural-color sponges, which are not damaged by soap. The business having outgrown the dimensions of the London works, a new factory is being fitted up in the more countrified surroundings of Woking, where a considerable number of hands will be engaged. A development of interest is the use of the sponge compound for toys and balls to take the place of inflated rubber articles and of celluloid goods. It is also to be used for truss pads and for other purposes such as flooring where resiliency is a desideratum. Such uses of sponge rubber seem to indicate a development of considerable significance to the rubber trade. Anyway, we have passed the initial stage of sponge making with which many of our rubber firms were wrestling not so many years ago.

BRITISH NOTES.

Edwin Swann, who was for fourteen years representative of the Anchor Chemical Co., Limited, has recently joined Alfred Smith, Limited, chemical manufacturers of Manchester, England.

An exhibition of specimens showing the diseases to which rubber trees are subject was recently held at the Imperial College of Science and Technology in South Kensington, London. It was arranged by Professor J. B. Farmer, director of the biological laboratories of the college, the specimens being sent chiefly from Ceylon and Malaya. The exhibits are diagrams; actual trunks of *Hevea*, showing how tapping works; specimens of rubber trees showing the diseases to which they are subject, and cultures which have been transferred by inoculation since their arrival in England, from the tainted stumps to other plants.

ANOTHER TEST OF RUBBER PAVEMENT IN LONDON.

The new stretch of rubber road pavement in Southwark, London, which was mentioned in THE INDIA RUBBER WORLD last July, has been laid in a busy thoroughfare where it will be severely tested. It covers 400 square yards on one side of Borough High Street, between St. George's Church and the Elephant and Castle, and a great part of the South London traffic must pass over it.

The blocks are 9 by 3 inches and ⅝ of an inch thick; ½-inch of gray rubber is placed on a layer of vulcanite held closely to a steel plate with circular perforations into which the vulcanite has been set to secure a firm hold. The steel plate is cut

RUBBER PAVING IN BOROUGH HIGH STREET, SOUTHWARK.

in four places and the strips cut are turned down to form lugs which are imbedded in a concrete foundation. The blocks rest on this granolithic concrete which is 3½ inches thick.

This pavement was manufactured by the Leyland & Birmingham Rubber Co., Limited, and is looked upon as a great improvement on those that were experimented with before the war, such as that in the Old Kent Road. This road surface is claimed to be sanitary, noiseless, and non-skidding, all of which has been proved to the satisfaction of careful observers.

FOREIGN NOTES.

At Manresa, near Barcelona, Spain, an automobile tire factory has been established, which expects to make fifty tires a day, enough to satisfy the present demand. The main part of the factory is used to produce *alpargatas*, cheap canvas shoes such as the poorer Spaniards use, but with rubber soles. These will outlast by far the usual hemp soles and can be made at a smaller cost.

Automobile tires are in great demand in Sweden at present. Competition is keen with American tires predominating. There

is a considerable market for high-priced tires. The Swedish prefer hand-made tires. The increased sale of motor cars in recent months causes the demand for accessories and spare parts to exceed the supply. In 1916 the imports of tires from Great Britain amounted to $151,500, from France to $106,680 and from the United States to $34,690.

NORWEGIAN TIRE DIMENSION REGULATION.

A new regulation proposed in Norway, relating to the dimensions of tires for use on trucks in that country, provides for the use of pneumatic tires on trucks smaller than 2-ton capacity, such as 1½- and 1-ton capacity, particularly for use on country roads. It is also proposed that the tread of tires used on country roads shall be not less than five inches. This legislation is being put forward in the attempt to prevent the spoiling of the roads which, otherwise, is looked for within two years.

A BIT OF HISTORY.

On the back of an interesting trade catalog of the year 1830, reproduced in facsimile by the Antwerp *"Bulletin des Planteurs de Caoutchouc,"* and which antedates not only the Belgian possession of African territory but the establishment of the present Kingdom of Belgium, are printed the conditions of an impending rubber sale: 6,407 pairs of shoes of gum elastic which came by the good ship *Matilda* are to be sold, as well as 161 pairs that arrived previously by the ship *Diana*. They are of three standard sizes and are packed in barrels and the brokers who handle them are firms, some of which are still in the rubber business, namely, Grisar & Co., Oldenhoven, de May, Chantrain and Ch. Franck & Co. The sale was limited to bona fide residents of Antwerp.

THE RUBBER TRADE IN JAPAN.

By Our Regular Correspondent.

THE LATEST OFFICIAL STATISTICS indicate that imports of crude rubber into Japan amounted in 1919 to 24,132,838 pounds valued at $8,682,098, an increase of 7,771,936 pounds and $2,-207,979 over the 1918 imports. The rate of the increase is 48 per cent in quantity and 34 per cent in value, showing that the rubber manufacturing industry in Japan is continuing the remarkable progress made during the war. This is chiefly attributable to the increase of investors in the industry. Notwithstanding the increase in Japanese rubber goods exports, the manufacture of automobile and bicycle tires, rubber cloths and mechanicals, also industrial rubber goods for home demands, was materially increased.

IMPORTS OF CRUDE RUBBER INTO JAPAN.

	1918.		1919.	
From:	Pounds.	Value.	Pounds.	Value.
British India	526,168	$234,207	507,147	$206,306
Straits Settlements	15,248,181	5,938,066	22,782,949	7,936,457
Dutch East Indies	274,716	73,775	95,593	21,841
Great Britain	148,652	126,281	545,885	357,803
United States	94,465	81,160	173,368	151,629
Other countries	68,720	20,630	27,896	8,062
Totals	16,360,902	$6,474,119	24,132,838	$8,682,098

IMPORTS OF RUBBER MANUFACTURES INTO JAPAN.

	1918		1919.	
	Pounds.	Value.	Pounds.	Value.
Unvulcanized	47,290	$9,656	155,429	$29,062
Dental rubber	23,284	54,097	33,497	85,053
Soft rubber				
Rods and cords	149,865	106,858	145,176	95,545
Plates, sheets and tubes	344,252	144,709	384,684	166,524
Threads, strips, bands, rings and washers	108,886	102,651	78,617	123,743
Other soft goods	172,394	98,473	162,800	94,034
Other rubber goods	33,677	31,074	71,681	63,869
Waste or old rubber	....	86,254	....	273,053
Bicycle tires	424	560	1,820	3,105
Insulated wire—				
Submarine cables	......	3,325	206,584	35,707
Other armored cables	10,005	3,821	131,956	72,920
Other wires	58,717	35,108	900,862	89,042
Waterproof sheeting	8,669	6,764	396,862	164,619
Elastic webbing	......	79,798	25,006	26,759
Insulating tape	24,566	11,923	....	138,559
Woven belts and hose	231,029	198,842	250,430	234,425
Totals	......	$973,913	....	$1,696,019

In addition to the above imports of rubber goods, automobiles and parts (including tires) were imported to the value of $5,641,150 in 1919 against $3,830,906 in 1918; and bicycle tires and parts to the value of $1,289,775 in 1919 against $750,364 in 1918.

In 1912 rubber goods imports reached their highest mark, but as the Japanese rubber manufacturing industry developed, foreign goods imports gradually decreased. Automobile and bicycle tires are now well made in Japan and supply most of the demand. In 1919 automobiles were imported largely and are in large demand for business purposes, but not as a luxury.

EXPORTS OF RUBBER MANUFACTURES FROM JAPAN.

	1918.		1919.	
	Pounds.	Value.	Pounds.	Value.
Rubber toys and balloons	......	$383,270	....	$671,883
Rubber tires	3,261,324	2,253,469	4,808,244	3,557,018
Insulated wires	12,742,382	4,162,167	12,501,023	4,205,850
Other rubber manufactures	....	612,600	....	1,255,171
Totals	....	$7,411,506	....	$9,689,922

There were also exported 2,609 jinrikishas, valued at $110,085 in 1919 against of 2,651 valued at $71,133 in 1918, and 5,660 bicycles and parts (exclusive rubber tires) valued at 1,690,911 in 1919, against 7,408 valued at $2,161,334 in 1918.

The total values amounted to $2,156,091 in 1915; $2,934,940 in 1916; $4,002,592 in 1917; $7,411,506 in 1918, and $11,490,918 in 1919. Jinrikishas for China, Hongkong, Straits Settlements and British India showed a gradual decrease, for they were exported as parts, not as completed vehicles. But the works have been erected in these districts to supply the parts and, on the other hand, the competition between jinrikishas and automobiles is beginning to be felt.

Owing to the interruption of trade during the war, Japanese rubber goods exports are increasing year after year, for the Japanese rubber industry is capable of supplying the lack of European and American goods in China, Manchuria, Malaya, British India, South Indies and Australia. Even now, after the restoration of peace, the Japanese rubber industry is still holding its gains during the war period.

NOTES FROM JAPAN.

Japanese rubber manufacturers have received enormous orders from Siberia. The Mitado, Toyo, Nippon and Meije factories have formed a combination to compete against the Dunlop establishment at Kobe.

In preparation for the expansion of automobile traffic, Japanese business men are about to form the Oriental Road Construction Co., with a capital of 10,000,000 yen. (One yen equals $0.498.) Besides the bad roads, the weak bridges are a hindrance to motor traffic, and to the hoped for development of Japan's motor industry.

In 1918, Japan imported 6,454,696 pounds of crude rubber and gutta percha, of which 5,920,521 pounds came from the Straits Settlements.

THE RUBBER AND COTTON TRADE OF THE NETHERLANDS.

THE RUBBER TRADE of the Netherlands was virtually at a complete standstill during the year 1918. There were no imports or exports of rubber, and only a very small quantity of the stock on hand was delivered to manufacturers. During the first half of the year trade between the Dutch East Indies and the United States was insignificant. When business later picked up and prices increased, the European situation and American import restrictions brought the trade to a sudden end. Very little business was done between the Netherlands and her colonies.

For the two periods from March to August, 1918, and from September, 1918, to February, 1919, the distribution of crude

rubber by the Netherlands Overseas Trust to manufacturers was effected at the base price of $1.18 per pound for prime *Hevea*, plus interest and warehouse charges from March 1, 1918. A lower price for the poorer qualities was fixed only after lengthy negotiations. The total quantity distributed was 464 tons. Manufacturers could use no more because of the lack of necessary compounding ingredients. Stocks in mid-July were estimated to be sufficient to last six months with a very restricted factory production.

The amounts of capital invested in Dutch rubber companies in recent years are of interest and were as follows: 1913, $908,520; 1914, $276,375; 1915, none; 1916, $522,600; 1917, $2,003,970; 1918, $779,880.

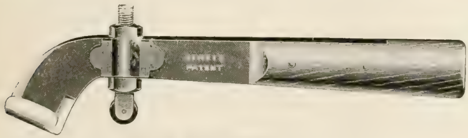
Rubber goods manufacture seems likely to be stimulated by the newly established cotton exchange of the Rotterdam Cotton Association, which promises to become a formidable competitor of the Bremen exchange. Although the textile industry of the Netherlands has been an important one, Dutch spinners before the war covered their requirements principally in Bremen and to a limited extent in Liverpool. Becoming dissatisfied with the practices of the Bremen merchants in 1915, the new Rotterdam cotton exchange was the result. Several large firms have engaged in the business; leading dock companies have constructed big modern cotton warehouses along the Meuse; the principal steamship companies will operate direct lines to Galveston and New Orleans at rates not above those to Bremen, and a guaranty fund has been pledged by Dutch merchants and spinners to defray the heavy initial expenses of the exchange. The Rotterdam rules have been established on the basis of Washington and Liverpool standards, but on the whole they correspond with the Bremen rules, as Continental buyers and American shippers are fully accustomed to them.

Rotterdam enjoys excellent shipping facilities essential to the success of this project. Much cheaper freight rates are obtainable on the rivers Rhine and Meuse to Belgium, the west and south of Germany, Alsace, Switzerland, and even to Austria and Italy, than those by rail from Bremen. Rotterdam also owns several regular direct steamship lines to Denmark, Norway, Sweden, Russia and the Baltic ports of Germany, so that in these countries the new exchange may compete favorably with Bremen.

A PLANTATION RUBBER KNIFE.

There is a variety of tapping tools in use at the present time on rubber plantations and all possess practical merit under certain conditions. The tool here illustrated is a type that includes simplicity in construction, adjustment, manner of use and in sharpening.

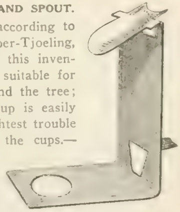
It is a modified farrier's knife with a strong tool-steel blade and provided with a "fool proof" adjustable gage for regulating the depth of the cut. The curve of the cutting edge is



Electro Tapping Tool.

designed for the purpose of effective cutting and paring, and when necessary the renewal of the edge by sharpening in the usual manner. The handle consists of two hardwood sections, that are riveted to the shank of the blade. (Thomas Newey & Sons, Limited, Birmingham, England.)

COMBINED LATEX CUP SUPPORT AND SPOUT.



Spout-cup Bearer.

This spout-cup bearer is made according to the idea of J. H. Recoert, Soember-Tjoeling, Dampit, Java. The advantages of this invention over all others are that it is suitable for any kind of cup; it does not wound the tree; no hard rubber, less scrap; the cup is easily seen; the tappers have not the slightest trouble with removing and putting back the cups.—(Netherland Indies Metal Ware & Packing Co., Malang, Java.)

THE DELFT RUBBER INSTITUTE.

The Netherland Government Institute for Advising the Rubber Trade and the Rubber Industry was established at Delft some years ago, under the patronage of the International Association for the Cultivation of Rubber in the Netherlands Indies, through the exertions of Professor G. van Iterson. In 1912 the first report and notes of the Institute appeared. A second instalment of notes appeared in 1916, making a volume of 500 pages, abstracts of which were published in English in 1917.

The object of the Institute is to place crude rubber commercial transactions on a scientific basis; to advise producers how crude rubber should be prepared; and to inform the trade how various crude rubbers should be treated.

The Batavia Exposition in 1914, enabled it to analyze samples and to compare the results of its investigation with those reached by the rubber brokers. Since then it has directed its attention to simplifying and shortening the examinations. Similar laboratories have been established in Java, at Kuala Lumpur in the Federated Malay States, and at the Imperial Institute, in London.

NOTES FROM THE FAR EAST.

The Medan Commercial Association states that the total area planted with rubber in the Sumatra East Coast district, including the Atchin east coast, at the end of June, 1919, was 133,543 hectares, of which 71,415 hectares were producing rubber. The whole area, despite unfavorable circumstances, has increased by 10 per cent.

The Ceylon Department of Agriculture has appointed an inspector with three sub-inspectors under him to watch the rubber plantations on the island for diseases and insect pests. They are to suggest measures for fighting these when discovered, and to urge the planters to join the official campaign of cure and prevention.

From Padang in Sumatra, 284,800 pounds of gutta percha were exported in the first six months of 1919, against 85,891 pounds in the same period of 1918.

The Dutch East Indies in the quarter ended September 30, 1919, exported to the United States 5,515,840 pounds of rubber valued at $2,165,015; 38,334 pounds of jelutong, valued at $3,624, and 4,145 pounds of gutta percha, valued at $1,051.

Calcutta has started a bus service employing 200 vehicles equipped with tires specially constructed to meet the difficulties of Calcutta roads.

India imported rubber tires in the four months from April to August, 1919, to the value of 3,560,000 rupees; of these the United States supplied 1,145,000 rupees worth and Japan 9,000 rupees worth. One rupee equals $0.32 United States currency.

Burma's largest ten rubber plantations produced 1,142,383 pounds of rubber in the first six months of 1919. The exports of rubber in those months amounted to 2,206,527 pounds valued at $836,052, compared with 1,340,074 pounds, valued at $808,831, exported in the first six months of 1918.

In Burma the Government has decided to advance 100 rupees at 6½ per cent. interest for every acre that is planted with rubber, with the hope of restoring the importance of the industry.

While the chief commercial product of the Fiji Islands is sugar and something is done in copra, the British administrators expect that the new rubber industry will become one of the most important. There are 225 islands in the group, 80 of which are inhabited, the largest being Viti Levu, on which is Suva, the capital and chief port. While there is steamer communication with Australia, New Zealand and Canada and the trade with the United States is by schooners, anxiety is expressed about American competition in Fiji, and still more is felt about Japanese enterprise.

Rubber conditions in Indo-China were in a bad state in the last half of 1918, owing chiefly to the French Government's prohibiting the exportation of rubber to any country but France, which coincided in point of time with the impossibilty of securing freight steamers and the very unfavorable course of exchange. Besides this the carelessness and inexperience of many planters sent rubber to the market that was irregular in quality, and especially in appearance. The result was a crisis which piled up 25,000,000 francs worth of rubber in storage and came near making many plantations give up work. A few orders amounting to about 1,200 tons, secured by the efforts of M. Garnier of the Marseilles Colonial Institute, have saved the situation to a certain extent. The planters have decided to organize their industry better and to establish a laboratory at Saigon.

Exports from Sumatra East Coast in 1919 exceeded by far those of previous years, as is shown by the figures compiled by the Medan Chamber of Commerce:

Exports.	1918.	1919
Hevea ... .*kilos*	19,445,447	38,185,935
Ficus elastica	361,840	182,136

The *Hevea* rubber exports were 96 per cent more than in 1918. The increase is due to increased production, that for 1919 being over 36,000 tons, while the 1918 production was abnormally small, owing to the intentional restrictions. The stock on hand was 4,000 tons at the beginning and 1,000 tons at the end of 1919.

The Incorporated Society of Planters at Kuala Lampur in the Federated Malay States, formed in October, 1919, has 237 members, and at the January meeting elected officers, as follows: Chairman, A. B. Milne, Ipoh; vice-chairman, H. Nixon, Malacca; secretary, C. Ward-Jackson. It is the first association of planters to be formed in Malaya, though there is a similar organization in Southern India. The object of the association is not commercial, but to promote the mutual welfare and to bring the planters and the companies that employ them into greater harmony of purpose.

RUBBER TREE DISEASES.

When the number of diseases and enemies to which rubber trees are subject are considered, the casual observer is inclined to wonder how rubber trees manage to survive at all. It is something like the study of a medical treatise by which the reader can easily persuade himself that he has symptoms of almost every known complaint. Fortunately, however, as in the latter case, all diseases do not attack every tree or every plantation at once. To-day brown bast easily takes first place among the enemies of rubber plantations. So far as the general public is concerned, this is practically a new disease. In point of fact, however, it has been known for many years, but only recently has attention been drawn to it to any considerable extent. In the old days when plantations were closely planted, it was a simple matter to eliminate altogether trees effected with this fatal disease. With the wider planting now generally practiced every tree counts for a tree, and, as every rubber shareholder knows, the question has recently assumed considerable prominence.

The first sign of brown bast is a big increase in the latex yield of the tree affected, but this soon diminishes and ultimately ceases altogether. The bark discolors and hard burrs appear, and if the disease is neglected the tree becomes useless. The disease is very prevalent throughout the East, few estates having less than 5 per cent and some as high as 60 per cent of their trees affected. Curative methods such as resting, liming and manuring have been tried without success and the only remedy known so far is that

("*The Rubber Age*," London.)

ADVANCED STAGE.

FINAL STAGE.

BROWN BAST.

of stripping the bark from the portions attacked, afterwards shading the cambium until a new growth of bark has developed. It is obvious that a disease of this kind is likely to exert a powerful influence on overproduction and should no remedial measures be found its increase at the worst might involve wholesale replanting of trees in from 15 to 20 years' time.

Up to quite recently brown bast was described as a physiological disease of the tree, the term in reality being only a confession of ignorance as to its true nature. It was supposed to be due to the effects of tapping and has been compared with anemia in a human being. Recently, however, a mycologist in Sumatra claims to have isolated a definite bacterium to which the disease is due, and should further research support this discovery, the search for a remedy would appear to be not so hopeless once the cause is known.

Among other diseases with which estates are troubled may be placed in order after brown bast, the well-known *Fomes, Ustulina,* pink dieback, striped canker, and a new enemy called patch canker, while it is well known that any diseased wood is liable to attacks from white ants. Apart from brown bast, however, which has so far defeated the best efforts, most of these diseases are well understood and can be adequately treated if taken in time.

ELCH GUM IN KURDISTAN.

In the part of Kurdistan which is now in British hands, at the head waters of the Tigris, a gum, resembling the lower grades of gutta, is obtained from a tree which the Arabs call Buttom and the Kurds, Gkraswam. The gum is called elk (elch) in Arabic and is obtained by tapping the tree, just as rubber trees are tapped. The tree produces also fruit which is used for food and is pressed for the oil it contains. The elch gum is transported to Aleppo and also to Bagdad; it is used for sizing cloth and as chewing gum, and also as medicine and in making arrack liquor from dates. The trees grow only in the valleys and attain a height of 50 feet and a girth of 8 feet.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED APRIL 13, 1920.

No. 1,336,452. Solid tire. H. K. Wheelock, Long Beach, Calif.
1,336,527. Door buffer of sheet rubber. S. G. Lewis, Greensburg, and G. W. Daum, Jeannette—both in Pennsylvania.
1,336,531. Demountable rim for tires. J. C. Manternach, assignor by mesne assignments to The Standard Parts Co.—both of Cleveland, O.
1,336,572. Fountain pen. C. A. Luck, assignor to The Conklin Pen Manufacturing Co.—both of Toledo, O. (Original application divided.)
1,336,601. Dirigible balloon. R. H. Upson, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.
1,336,663. Pneumatic tire. E. M. Story, Braintree, Mass.
1,336,746. Rubber-dam clamp appliance. J. W. Ivory, Philadelphia, Pa.
1,336,962. Rubber sandal. F. A. Joseph, assignor to L. Candee & Co.—both of New Haven, Conn.
1,337,178. Receptacle for pneumatic tire tubes. M. F. Swerer, Jamestown, Calif.

ISSUED APRIL 20, 1920.

1,337,211. Milking machine teat cup. J. G. G. Eklundh, C. Oden, and J. A. Schmidt, assignors to The Universal Milking Machine Co.—all of Columbus, O.
1,337,225. Artificial respirator. C. L. Heald, Cedar Rapids, Iowa.
1,337,288. Fuel hose for gas fixtures. C. Stichler, assignor to Strause Gas Co.—both of Philadelphia, Pa.
1,337,289. Resilient tire. J. G. Summers, San Diego, Calif.
1,337,316. Pneumatic tire valve. J. O. Helliwell, Pasadena, Calif.
1,337,443. Resilient reinforced non-skid tire. D. J. Demas, Pittsburgh, Pa.
1,337,446. Demountable sectional rim for tires. M. A. and L. M. Endres, Cross Plains, Wis.
1,337,528. Spring plate tire filler. J. H. North, Blackwood, N. J.
1,337,606. Dust cap for tire valves. A. L. Just, Syracuse, N. Y.
1,337,660. Pneumatic tire. E. B. Killen, London, England.
1,337,813. Pneumatic tire. E. P. Altenburg, Columbiana, O.
1,337,962. Rubber and fiber composition heel-plate for shoes. Hugh G. Robinson, Philadelphia, Pa.

ISSUED APRIL 27, 1920.

1,338,011. Armored pneumatic tire. B. Granville, New York City.
1,338,054. Dust cap for tire valve stems. W. E. Vollmer, Sandusky, O.
1,338,072. Demountable rim for tires. R. R. Craft, Norfolk, Nebr.
1,338,110. Demountable rim for tires. B. A. Stocking, Boone, Iowa.
1,338,145. Demountable rim for tires. A. E. McPherson, assignor to J. Rosenthal—both of Beaumont, Tex.
1,338,184. Combination rubber stamp and pen rack. L. B. Lindquist, Maida, N. D.
1,338,245. Tire valve. E. V. Myers, East Orange, N. J., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.
1,338,390. Demountable rim for tires. O. W. Mott, Jackson, Mich., assignor to Perlman Rim Corp., New York City.
1,338,464. Douche tip. M. M. Shafer, Los Angeles, Calif.
1,338,578. Surgical tourniquet. R. Maeda, Seattle, Wash.
1,338,584. Cushion horseshoe. H. Paar, Canton, assignor of one-third to C. McGranahan, Youngstown—both in Ohio.
1,338,595. Pneumatic tire with supplementary tire within inner tube. W. J. Stoltz, St. Louis, Mo.
1,338,629. Fountain-pen. C. E. Hood, Memphis, Tenn.

ISSUED MAY 4, 1920.

1,338,677. Demountable and fixed rims for tires in combination. T. E. Cook and A. T. Freije, Rincon, N. Mex.
1,338,710. Douche nozzle. E. V. Szyperski, Detroit, Mich.
1,338,817. Cushion heel. P. A. De Luca, New York City.
1,338,858. Lady's garter. M. de Los S. Enriquez, New York City.
1,338,905. Anaesthetic apparatus. A. C. Clark, assignor to A. C. Clark & Co.—both of Chicago, Ill.
1,338,986. Rubber and metal hoof protector for horses. W. J. Kent, Brooklyn, N. Y., assignor to The Mechanical Rubber Co., a New Jersey corporation.
1,339,216. Windshield cleaner. L. H. Morse and J. J. Tracy, Cleveland, Ohio; said Morse assignor to said Tracy.
1,339,241. Duplex windshield cleaner. H. C. Trip, Auburn, N. Y.
1,339,283. Sectional inner tube for tires. J. A. Perkins, Brooklyn, N. Y.

THE DOMINION OF CANADA.

ISSUED APRIL 6, 1920.

198,900. Pneumatic seat cushions. G. L. Chase, Seattle, Washington, U. S. A.
198,930. Cushion heel with protecting plate. H. Glover, South Acton, Mass., U. S. A.
199,093. Sectional tire with removable blocks of rubber, etc., to facilitate replacement and also provide for insertion of alternative projecting studs for use on soft ground. E. Feuillette, Boulogne sur Seine, France.

ISSUED APRIL 13, 1920.

199,105. Tire package. E. H. Angier, Framingham, Mass., U. S. A.
199,116. Electric repair pad vulcanized for pneumatic tires. D. E. Booth, Tulsa, Okla., U. S. A.
199,119. Dust cap and sleeve for inflating tubes. E. O. Collins, Chillicothe, Ohio, U. S. A.
199,144. Dust cap for tire valves. A. L. Just, Syracuse, N. Y., U. S. A.
199,147. Dust cap for tire valves. H. P. Kraft, Ridgewood, N. J., U. S. A.
199,148. Tire valve. H. P. Kraft, Ridgewood, N. J., U. S. A.
199,149. Inflating coupling. H. P. Kraft, Ridgewood, N. J., U. S. A.
199,159. Tire valve cap. W. P. McComb, Conroe, Tex., U. S. A.
199,165. Blow-off valve for tire inflation tubes. E. W. Phillips, Delta, O., U. S. A.
199,204. Blow-off and hose connection for tires. The Automatic Safety Tire Valve Corp., New York City, assignee of S. Kahn, Newark, N. J.—both in U. S. A.
199,222. Dust cap for tire valves. A. Schrader's Son, Inc., New York City, assignee of F. Nielson, Dorchester, Mass.—both in U. S. A.

ISSUED APRIL 20, 1920.

199,261. Demountable rim for tires. N. L. Baker, Minneapolis, Minn., U. S. A.
199,262. Demountable rim for tires. N. L. Baker, Minneapolis, Minn., U. S. A.
199,298. Armored pneumatic tire of rubber and fabric. G. R. Granzow, Thompson, Iowa, U. S. A.
199,306. Pneumatic tire. P. L. Hedges, Charleston, Ill., U. S. A.
199,326. Vaginal douche. T. H. Larson, Oshkosh, Wis., U. S. A.
199,329. Removable resilient pad for crutches, artificial limbs, etc. F. C. Lynde, Manchester, England.
199,348. Pneumatic tire. H. Nicholson, Chicago, Ill., U. S. A.
199,426. Demountable rim for tires. W. H. Fox and B. W. Japs, assignee of one-half interest—both of Minneapolis, Minn., U. S. A.
199,441. Pneumatic tire. J. A. Johnson, Indianapolis, Ind., U. S. A.

ISSUED APRIL 27, 1920.

199,482. Gum and mint case. L. W. Buchenau, Stockton, Calif., U. S. A.
199,499. Cushion tire. F. Ditchfield, Montreal, Quebec, Canada.
199,520. Lumberman's rubber balmoral having water-tight tongue vulcanized in one with body. C. L. Grant, Grande Pre, Nova Scotia, Canada.
199,527. Pneumatic tire having layers of sponge rubber disposed between outer casing and inner casing, and inner casing and inner tube, the layers being vulcanized to inner casing to form a homogeneous structure. L. Hofmeister, Milwaukee, Wis., U. S. A.
199,573. Rubber heel cushion formed in two parts made integral, one being more resilient than the other. J. Pietzuch, Cincinnati, O., U. S. A.
199,663. Shower bathing apparatus of perforated tubing, etc. The Simplex Shower Bath Co., assignee of H. W. Patrick—both of Mansfield, O., U. S. A.

THE UNITED KINGDOM.

ISSUED APRIL 8, 1920.

138,393. Pneumatic tire with reinforced tread. J. F. F. W. Ure, 13 Trinity Gardens, Folkestone, Kent.
138,399. Revoluble rubber heel. A. E. and F. J. Lancaster, 212 Bristol Road, Edgbaston, Birmingham.
138,520. Rubber corn shield. W. R. Edwards, 15 Earl street, Maidstone, Kent.
138,553. Pneumatic tire. W. C. Whalley and J. A. Andrews, 4 Marldon avenue, Great Crosby, Liverpool.

ISSUED APRIL 14, 1920.

138,630. Pipe couplings. Titeflex Metal Hose Corp., Badger avenue, Newark, assignee of W. H. Fulton, Irvington—both in New Jersey, U. S. A. (Not yet accepted.)
138,631. Gas masks. M. Meyer, 4 Nymphenburgerstrasse, Schonberg, Berlin. (Not yet accepted.)
138,638. Gas masks. M. Meyer, 4 Nymphenburgerstrasse, Schonberg, Berlin. Addition to No. 138,631. (Not yet accepted.)
138,694. Combined pressure gage and relief valve for tires. W. E. Beasley, Rose Cottage, Cheddington, Buckinghamshire.
138,717. Demountable rim for tires. W. Ormsby, 20 Sneinten Boulevard, Nottingham.
138,779. Demountable rim for tires. J. Knight, 9 Caldy Road, Aintree, Liverpool.
138,781. Solid tire. G. Jackson, The Cedars, Albert Road, Wolverhampton, and W. W. Hickman, Beech Tree House, Wall Heath, near Dudley—both in Staffordshire.
138,789. Fountain pen. A. A. Peace, 30 Loreburn Road, Wavertree, Liverpool.
138,794. Soles and heels for boots, having air cells and insertions of vulcanized asbestos composition to prevent slipping. M. T. M. Byrne, 333 St. John street, and G. H. Long, 122 Upper street, Islington—both in London.

ISSUED APRIL 21, 1920.

139,076. Pneumatic tire valve. A. C. Wright and Warne, Wright & Rowland, Keeley street, Watery Lane, Birmingham.
139,117. Device for closing the neck of a toy balloon after inflation. W. F. Ingram, 165 Parnell Road, Old Ford, London.
139,206. Marking pens and brushes. C. A. Garvey, Clayton, Mo., U. S. A. (Not yet accepted.)
139,331. Foot-pad for motorcycle pedals. A. J. Stevens & Co. and A. J. Stevens, Graiseley House, Penn Road, Wolverhampton.
139,356. Dust cap for tire valves. G. B. Ellis, 70 Chancery Lane, London. (A. Schrader's Son, 783 Atlantic avenue, Brooklyn, N. Y., U. S. A.)
139,374. Motorist's cap with elastic lining. M. and N. Doniger, trading as Empire Cap Works, Derby street, Cheetham, Manchester.
139,450. Resilient wheel with pneumatic tire and tread band formed of strips of hard rubber alternating with strips of softer rubber, both resting on a band of hard rubber, etc. A. A. A. Darche, Edith Cavell Road, Alger, Algeria. (Not yet accepted.)
139,471. Elastic bust supporter. D. Kops, 525 West End avenue, New York City, U. S. A. (Not yet accepted.)
139,500. Spring wheel with pneumatic tube. M. T. Weston, 200 Fifth avenue, New York City, U. S. A. (Not yet accepted.)
139,562. Cord fabric for covering pneumatic tires. C. L. Marshall, 27 Queen Victoria street, London.
139,624. Tobacco pouch with rubber-lined pocket. W. J. Beeby, 8 Eversley Road, Small Heath, Birmingham.

Chemical Patents will be found on page 583. Machinery Patents on page 587.

THE FRENCH REPUBLIC.

PATENTS ISSUED, WITH DATES OF APPLICATION.

500,458. (October 26, 1918.) Soling of rubber, combined with any substance that reduces its elasticity. Société Française de Cuir Armé.
500,650. (June 12, 1919.) Rubber-covered cord. S. G. Lewis.
500,836. (June 19, 1919.) Improvements in pneumatic tires. A. P. R. Porte.
500,688. (June 14, 1919.) Shoes with vamp made of waste wrappings of pneumatic tires and other rubber articles. Société Kunstgaard Gummifabrik.
500,877. (June 20, 1919.) Inflating valve for pneumatic tires. Etablissement L. Rosengart.
501,060. (June 25, 1919.) Valve for pneumatic tire. T. A. Low.
501,089. (June 26, 1919.) Improvements in pneumatic tires. F. W. Lanchester.
501,341. (June 10, 1919.) Improvements in revoluble rubber and other kinds of heels. A. Cleret, avenue Alphand 19, Saint-Mandé.
501,525. (July 7, 1919.) Valve for pneumatic tires. T. A. Low.
501,535. (July 5, 1919.) Improvements in elastic tires. G. Negri.
501,753. (July 18. 1919.) Perfected resilient tire. C. C. Crump.
502,104. (July 30, 1919.) Safety device for pneumatic wheels. O. Englebert & Cie.

GERMANY.

PATENTS ISSUED, WITH DATES OF APPLICATION.

321,276. (September 12, 1915.) Pneumatic tire. A. A. Pancera, Genoa, Italy.
321,359. (January 18, 1912.) Pneumatic tire. E. B. Killen, London.
321,439. (July 20, 1913.) Belting. A. Jonas and G. Getting, St. Denis, France.
321,753. (March 18, 1919.) Packing ring. G. Bunge, Kücknitz, near Lüxbeck.
321,890. (January 15, 1919.) Bandage. H. Garoli, Lahr, Baden.

TRADE MARKS.

THE UNITED STATES.

NO. 113,134. The words BEADED TIP—rubber heels. United Lace & Braid Manufacturing Co., Cranston, R. I. (See THE INDIA RUBBER WORLD, August 1, 1919, page 638.)
116,015. The words DURACORD HARD SERVICE CABLE above a horizontal line—electric portable cables protected by rubber—impregnated woven insulation. Tubular Woven Fabric Co., Pawtucket, R. I. (See THE INDIA RUBBER WORLD, February 1, 1920, page 299.)
117,024. The words DURA-SET—insulated-wire conductors. Tubular Woven Fabric Co., Pawtucket, R. I.
117,403. The words GOLIATH and THE GENERAL RUBBER GOODS CO., CLEVELAND, OHIO, contained within a diamond—belting, hose and packing. The General Rubber Goods Co., Cleveland, O.
117,655. Representation of a leaf and flowers of lily-of-the-valley and the word LILY on a scroll around the stems—elastic webs. Faire Bros. & Co., Limited, Leicester, Eng.
117,787. The words VULCA PATCH within a rectangle separated by the representation of a tire and underneath the tire the words THE PATCH THAT SEALS—self-vulcanizing tire patch. Vulca Laboratories, San Francisco, Calif.
117,658. Representation of a pansy above the word PANSY—elastic webs. Faire Bros. & Co., Limited, Leicester, Eng.
119,348. Representation of a Liberty cap bearing three stars on the head-band, above a horizontal line over the word LIBCO, all within the conventionalized outline of a shield—rubber tires. Liberty Steel Products Co., Inc., New York City.
119,707. The stencilled letters I BECO—rubber belting, hose, packing, etc. Imperial Belting Co., Chicago, Ill.
120,778. The word USCO—floor covering now made of rubber compound. United States Rubber Co., New Brunswick, N. J., and New York City.
121,440. The words BOONE TIRES separated by a picture of the pioneer Daniel Boone, inclosed within a circle above a scroll—rubber and canvas tire casings. Boone Tire & Rubber Co., Chippewa Falls, Wis.
121,896. The word REXALL in stencilled letters—elevator, conveyor, or transmission belting of rubber, etc. Imperial Belting Company, Chicago, Ill.
122,997. The words RUB-TEX—fibrous rubber mats for floors, automobiles, running boards, etc. Rub-Tex Organization Co., Kenton, O.
123,366. A red seal beneath the words RED SEAL—inner-tube repair outfits. Red Seal Rubber Manufacturing Co., Oklahoma, Okla.
124,015. The words FLINT-ROCK within a white diamond superimposed on a black disk, all inclosed by a white circle—rubber-soled shoes made of fabric and rubber. Sears, Roebuck & Co., Chicago, Ill.
124,915. The word OUTLOOK—wind-shield cleaners of the squilgee type. (See THE INDIA RUBBER WORLD, April 1, 1918, page 413.)
125,155. The letter X above the letter J, with a horizontal line between—leather shoes with rubber soles and heels. Jureidini Export Co,, New York City.
125,162. The word NORWALK superimposed on a panel picture of a fleet of yachts against a background of sea and clouds, the panel being in turn superimposed on a tire with the words FLOATING STOCK between the panel and the lower part of the tire—rubber tires. The Norwalk Tire & Rubber Co., Inc., Norwalk, Conn.
125,261 The initials and words "W. L. TEDFORD'S SUPER SERVICE PATCH, KEEP A KAN IN YOUR KAR," the initials and word "W. L. Tedford's" being a facsimile of the applicant's signature—tires, tubes, and casing-patch. W. L. Tedford, Little Rock, Ark.
125,964. The words BLACK BEAUTY—rubber water-bags and rubber bottles. The Miller Rubber Co., Akron, O. (See THE INDIA RUBBER WORLD, March 1, 1918, page 353.)
126,022. The words "ONE-SET," the hyphen being formed by an extension of the cross-piece of the first "e"—printing-press inking rollers. The B. F. Goodrich Co., New York City.
126,154. Representation of a black-outlined rectangle bisected vertically by a single heavy line extending above and below—brake linings. Thermoid Rubber Co., Hamilton Township, Mercer County, N. J.
126,213 The word RELCO within an oval beneath the word RELIABLE, and at the right and left, respectively, of the oval, the words REG. U. S. PAT. OFFICE and NEW YORK, U. S. A.—fountain pens. Abraham Harris, New York City.
126,436. The word GRIZZLYBEAR—a duplex crinkled or creped paper for wrapping tires, etc. Angier Mechanical Laboratories, Framingham, Mass.
126,572. The words MOR-ECON—elevator belts made of rubber reinforced with fabric. The B. F. Goodrich Co., New York City.
126,606. The word JOLIET above representation of head of Joliet—jar rubbers. Walker-Matteson Co., Joliet, Ill.
126,586. The word ALLROAD—rubber or rubber and fabric tires and tubes McClaren Rubber Co., Charlotte, N. C.
126,793. Representation of an Indian arrow-head in silhouette pointing to the right—rubber boots, shoes, etc. Nathaniel Fisher & Co., New York City.
127,121. The word CLIMAX—arm-pit dress shields and diaper supporters. M. S. George, St. Louis, Mo.
127,503. The words REST-ASSURED inclosed in an oval formed by the end of the letter R—rubber boots and shoes, etc Nathaniel Fisher & Co., New York City.
127,722. The words KENYON CORD—rubber tires and tubes. C. Kenyon Co., Brooklyn, N. Y.
127,750. The letter A within the outline of a club-spot—hard rubber battery jars, insulations, etc. American Hard Rubber Co., Hempstead and New York City, N. Y.
128,138. The word ORBITAN—combined rubber, leather, and fabric shoes and slippers. A. J. Bates & Co., Inc., New York City.
128,290. The word AMICUS—rubber boots and shoes and boots and shoes made wholly or partly of leather. American-National Shoe & Leather Corp., New York City.
128,492. The word DEFIANCE, combined with conventionalized sprays of leaves and knot of ribbon, forming frame around the letter "G"—hard or semi-hard rubber battery jars. The B. F. Goodrich Co., New York City.
128,494. The letter "G" framed by conventionalized sprays of leaves and knot of ribbon—hard or semi-hard rubber battery jars. The B. F. Goodrich Co., New York City.
128,495. The word DEFIANCE above the letter "G" framed by conventionalized sprays of leaves and knot of ribbon—hard or semi-hard rubber battery jars. The B. F. Goodrich Co., New York City.
129,152. Representation of a section of belting having a copper thread or wire laid or woven longitudinally in it—rubber and other kinds of belting having a copper thread or wire woven or laid in them longitudinally. The Rossendale-Reddaway Belting and Hose Co., Newark, N. J.

THE DOMINION OF CANADA.

26,133. Circular device comprising the outer concentric circles and arbitrary inner circular arrangement of stripes forming a fantastic and distinctive simulation of the word KELLY, bifurcated to display the word SPRINGFIELD—pneumatic and solid tires and inner tubes. Kelly-Springfield Tire Co., New York City.
26,138. Representation of a maple leaf with the name, THE MAPLE LEAF RUBBER COMPANY, LIMITED, printed with distinctive arrangement underneath and presenting a suitable base for the leaf—Canadian Consolidated Rubber Company, Limited, Montreal, Que.
26,214. The letter "P"—rubber tires, soft rubber goods, druggists' sundries, etc. The F. E. Partridge Rubber Co., Limited, Guelph, Ont.
26,215. The word PARTRIDGE—same goods as No. 26,214. The F. E. Partridge Rubber Co., Limited, Guelph, Ont.
26,217. Representation of an inflated rubber tire with a partridge standing erect within the circle thereof and upon the inner edge of the lower portion—rubber footwear. The F. E. Partridge Rubber Co., Limited, Guelph, Ont.
26,218. The letter "N"—same goods as Nos. 26,214 and 26,215. The F. E. Partridge Rubber Co., Limited, Guelph, Ont.
26,219. The word NORTHERN—rubber tires, soft rubber goods, druggists' rubber sundries, etc. The F. E. Partridge Rubber Co., Limited, Guelph, Ont.
26,220. The letter "P"—rubber footwear. The F. E. Partridge Rubber Co., Limited, Guelph, Ont.
26,262. The word ELASTICAPS—rubber insulators for electric wire splices. The Elasticap Co., Hoboken, N. J., U. S. A. (See THE INDIA RUBBER WORLD, March 1, 1920, page 366.)
26,279. The words GEARED TO THE ROAD used in connection with the words Miller Tires—rubber tires and tubes. The Miller Rubber Co., Akron, O., U. S. A. (See THE INDIA RUBBER WORLD, March 1, 1919, page 311.
26,289. The words ACE-HI—footwear, clothing, heels and soles, vehicle and animal coverings, cloth, belting, hose, tires, insulating material, cement, druggists' sundries and plumbers' supplies, etc., made wholly or partly of rubber or treated with substances containing rubber. The Miner Rubber Co., Limited, Montreal, Que.
26,290 The word TRIUMPH—same goods as No. 26,289. The Miner Rubber Co., Limited, Montreal, Que.
26,291. The words RAIN KING—same goods as Nos. 26,289 and 26,290. The Miner Rubber Co., Limited, Montreal, Que.
26,292. The word FRONTENAC—same goods as Nos. 26,289 to 26,291, inclusive. The Miner Rubber Co., Limited, Montreal, Que.
26,293. The word KIDDIE—same goods as Nos. 26,289 to 26,292, inclusive. The Miner Rubber Co., Limited, Montreal, Que.
26,294. The word COLLEGIATE—same goods as Nos. 26,289 to 26,293, inclusive. The Miner Rubber Co., Limited, Montreal, Que.
26,295. The word VIKING—same goods as Nos. 26,289 to 26,294, inclusive. The Miner Rubber Co., Limited. Montreal, Que.

THE UNITED KINGDOM.

389,268. The word ARIEL—elastic webs and cords for use in clothing. Faire Bros. & Co., Limited, 2 Southampton street, and St. George's Mills, Leicester.
390,957. The words WILLSON GOGGLES, and upstanding from the second "l" of the word "Willson" a circle containing the letter "W" and a pair of goggles—rubber-rimmed safety goggles. T. A. Willson & Co., Inc., Second and Washington streets, Reading, Pa., U. S. A. (See THE INDIA RUBBER WORLD, page 591, this issue.)
395,075. The word LEWCOS—rubber-insulated wire. The London Electric Wire Co. and Smiths, Limited, 7 Playhouse Yard, Golden Lane, London, E. C. 1.

395,451. The word Autoglider—rubber tires. C. R Townsend, Caxton House, Great Charles street, Birmingham.
395,701. The word "Liquidcuir" in quotation marks—liquid preparations for the repair of boots, shoes, and leather articles. Henri Boissen, 20 rue du Louvre, Paris. Care of G. F. Redfern & Co., 15 South street, Finsbury, London, E. C. 2.
396,015. The word The "Oxford" above circular picture of a man and a girl boating, all above the words Gentlemen's Complete Series Comprising One Pair Braces, One Pair Suspenders, One Pair Arm Bands, Made at Leicester—braces, suspenders, and arm bands. W. B. Martin & Co., 14 York street, Leicester.
396,159. The word Carmac—clothing, except corsets, included in Class No. 38. Carmac Rubber, Limited, Huntershill Works, Bishopbriggs, Glasgow, and 6-8 Lime Street Square, London, E. C.
396,160. The word Carmac—rubber and gutta percha goods not included in classes other than No. 40. Carmac Rubber, Limited, Huntershill Works, Bishopbriggs, Glasgow, and 6-8 Lime Street Square, London, E. C. 3.
396,629. The word Feroleum—all goods included in Class No. 40. The Herbert Frood Co., Limited, Sovereign Mills, Hayfield Road, Chapel-en-le-Frith, Derbyshire.
397,328. The word Triflex—all goods included in Class No. 40. The Standard Tyre and Rubber Manufacturers, Limited, Parliament Mansions, Victoria street, London, S. W. 1.
397,822. The word Relax—garters. Eisman & Co. (London), Limited, 36 Basinghall street, London, E. C. 2.
398,237. Representation of a label bearing a Brownie-type figure whose body is composed of the conventionalized letters NN, looking and pointing at a seal bearing the same letters in the form of a monogram above the words Double N Brand—all rubber goods included in Class No. 40. Nicholsons (Newcastle-on-Tyne), Limited, St. Ann's Chemical Works, Heaton Junction, Newcastle-on-Tyne, E.
398,254. Representation of a number of gnomes carrying tires—tires and tubes. F. W. Farr, Reclaim Works, 16 Henry street, Northampton.
398,255. Representation of a statue standing on a base inscribed Hercules, holding up two chains which in turn support a number of gnomes carrying tires—tires, tubes, etc. F. W. Farr, trading as Hercules Tyre Co., Reclaim Works, 16 Henry street, Northampton.
398,331. The word Dexo—rubber outer covers for tires and tubes. Derry and Edwards, 1 Great Eastern street, London, E. C. 2.
398,537. The word Spartite—asbestos packings, etc. Spartan Manufacturing Co., Limited, Broad Street House, New Broad street, London, E. C. 2.
400,762. The word Solanti—rubber and gutta percha goods not included in classes other than No. 40. The India-Rubber, Gutta-Percha & Telegraph Works Co., Limited, 106 Cannon street, London, E. C. 4.
400,763. The word Solanti—hose included in Class No. 50. The India-Rubber, Gutta Percha & Telegraph Works Co., Limited, 106 Cannon street, London, E. C. 4.

NEW ZEALAND.

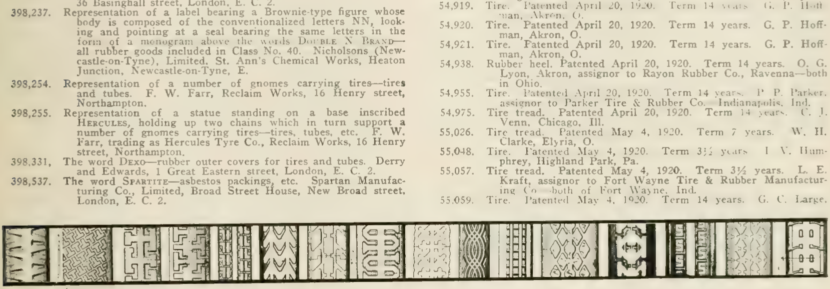
TO AMERICANS.

16,404. The word Republic—rubber tires, tubes, belting, hose, and packing, and rubber goods of all kinds in class No. 40. The Republic Rubber Corporation, Youngstown, O., U. S. A.

DESIGNS.

THE UNITED STATES.

No. 54,900. Bathing cap. Patented April 20, 1920. Term 14 years. F. W. Dodge, assignor to The Seamless Rubber Co., Inc.—both of New Haven, Conn.
54,901. Bathing cap. Patented April 20, 1920. Term 14 years. F. W. Dodge, New Haven, Conn.
54,903. Rubber ball. R. C. Eddy, Milwaukee, Wis.
54,912. Tire. Patented April 20, 1920. Term 7 years. W. H. Grote, assignor to Ten Broeck Tyre Co.—both of Louisville, Ky.
54,919. Tire. Patented April 20, 1920. Term 14 years. G. P. Hoffman, Akron, O.
54,920. Tire. Patented April 20, 1920. Term 14 years. G. P. Hoffman, Akron, O.
54,921. Tire. Patented April 20, 1920. Term 14 years. G. P. Hoffman, Akron, O.
54,938. Rubber heel. Patented April 20, 1920. Term 14 years. O. G. Lyon, Akron, assignor to Rayon Rubber Co., Ravenna—both in Ohio.
54,955. Tire. Patented April 20, 1920. Term 14 years. P. P. Parker, assignor to Parker Tire & Rubber Co., Indianapolis, Ind.
54,975. Tire tread. Patented April 20, 1920. Term 14 years. C. J. Venn, Chicago, Ill.
55,026. Tire tread. Patented May 4, 1920. Term 7 years. W. H. Clarke, Elyria, O.
55,048. Tire. Patented May 4, 1920. Term 3½ years. I. V. Humphrey, Highland Park, Pa.
55,057. Tire tread. Patented May 4, 1920. Term 3½ years. L. E. Kraft, assignor to Fort Wayne Tire & Rubber Manufacturing Co.—both of Fort Wayne, Ind.
55,059. Tire. Patented May 4, 1920. Term 14 years. G. C. Large, assignor to Wear-Well Tire Co.—both of Mahoningtown, Pa.



54,912 54,919 54,920 54,921 54,955 55,057 55,100 55,094 54,975 55,026 55,048 55,059 55,080 55,087 55,101 55,091

55,080. Tire. Patented May 4, 1920. Term 7 years. E. A. Reid, Somerset, N. J.
55,087. Tire. Patented May 4, 1920. Term 7 years. A. B. Schleicher, Pasadena, Calif.
55,091. Tire. Patented May 4, 1920. Term 14 years. F. E. Shannon, Akron, O.
55,094. Tire. Patented May 4, 1920. Term 14 years. H. J. Smith, Binghamton, N. Y.
55,100. Tire. Patented May 4, 1920. Term 3½ years. J. Tenney, Jr., Plainfield, N. J.
55,101. Tire. Patented May 4, 1920. Term 3½ years. E. H. Trump, Barberton, O.
55,104. Rubber-rimmed safety goggles. Patented May 4, 1920. Term 14 years. F. Willson, assignor to T. A. Willson & Co., Inc.—both of Reading, Pa. (See The India Rubber World, page 591 this issue.)

398,708. The word Urpco—rubber and gutta percha goods included in Class No. 4. United Rubber Products, Limited, 5 Fenchurch street, London, E. C. 3.
398,709. The word Urpco—rubber and gutta percha goods included in Class No. 11. United Rubber Products, Limited, 5 Fenchurch street, London, E. C. 3.
398,710. The word Urpco—rubber and gutta percha goods included in Class No. 38. United Rubber Products, Limited, 5 Fenchurch street, London, E. C. 3.
398,711. The word Urpco—rubber and gutta percha goods included in Class No. 39. United Rubber Products, Limited, 5 Fenchurch street, London, E. C. 3.
398,712. The word Urpco—rubber and gutta percha goods not included in classes other than Class No. 40. United Rubber Products, Limited, 5 Fenchurch street, London, E. C. 3.
398,858. A monogram composed of the letters P and B—rubber and similar belting included in Class No. 40. J. R. Crawford, 43 Robertson street, Glasgow.
398,870. The word Sterando—all rubber goods included in Class No. 40. Anderson & Whitelaw, Limited, 11-12 Broad street corner, Birmingham, Warwickshire.
398,928. The word Philco—rubber and gutta percha goods not included in classes other than Class No. 40. Philadelphia Storage Battery Co., Ontario and C streets, Philadelphia, Pennsylvania, U. S. A. (Care of Johnsons & Willcox, 47 Lincoln's Inn Fields, London, W. C. 2.)
399,011. The word Asticel—elastic corsets. The U. K. Corset Co., 16 Goldsmith street, Nottingham.
399,711. The word Dielex—electrical insulators, rubber-covered, etc. J. J. Eastick & Sons, 3 Belfast Road, Stoke Newington, London, N. 16.
399,783. The word Riplaco—rubber and gutta percha goods not included in other classes than Class No. 40. The Anglo-American Commercial Corp., Limited, 34 Lombard street, London, E. C. 3.
399,895. The word Astra—all goods included in Class No. 40. G. E. Gardner, 231 Deansgate, Manchester.
400,165. The word Ediswan—rubber and gutta percha goods not included in classes other than No. 40. The Edison Swan Electric Co., Limited, 123-125 Queen Victoria street, London, E. C. 4.
400,356. The word Peresco—rubber stamps, dating stamps, etc. Pneumatic Rubber Stamp Co. (Buck's Patent), Limited, 18-19 Queenhithe, Upper Thames street, London, E. C. 4.
400,531. Representation of a bird of the parrot type perched within a tire, attacked by a number of arrows—pneumatic tires, inner tubes, and inner tube protectors. Eugene Collet, 27 avenue Crampel, Toulouse (Haute Garonne), France. Care of Cruikshank & Fairweather, 65-66 Chancery Lane, London, W. C. 2.
400,613. The word Tenax—jointings and packings included in Class No. 50. A. Oppenheimer & Co., 38 Finsbury Square, London, E. C. 2.
400,680. The word Leglot—sanitary appliances. The Leyland & Birmingham Rubber Co., Limited, Golden Hill Works, Leyland, Lancashire.

THE DOMINION OF CANADA.

4,759. Tire. Patented April 13, 1920. Hercules Rubber Co., Limited, Brampton, Ont.
4,760. Tire. Patented April 13, 1920. Lion Tire & Rubber Co., Limited, Toronto, Ont.
4,761. Tire. Patented April 13, 1920. M. J. Atkinson, Mimico, Ont.
4,762. Tire. Patented April 13, 1920. M. J. Atkinson, Mimico, Ont.

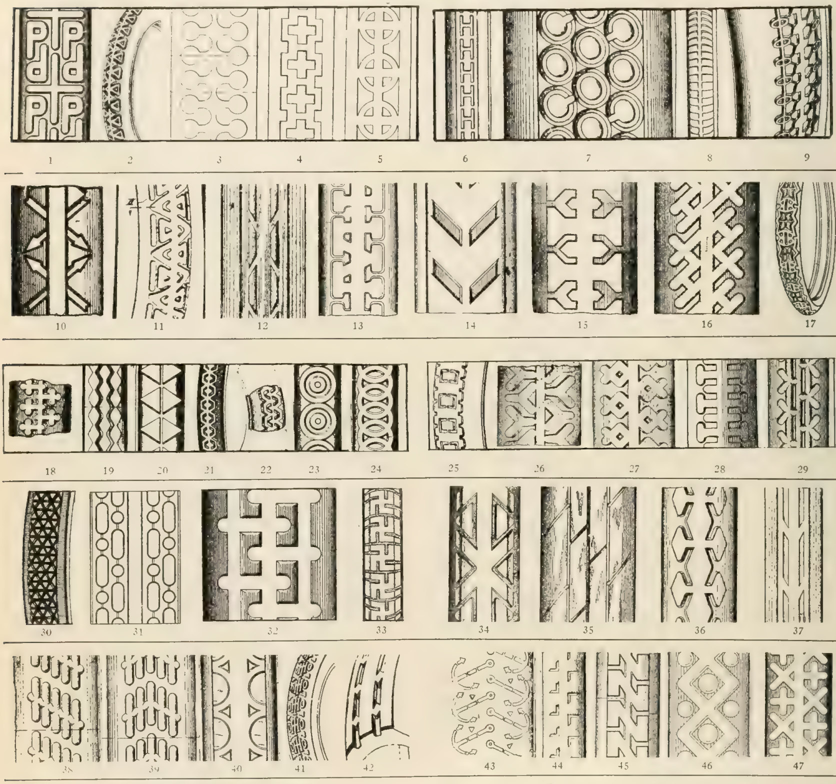
A COURSE IN INDUSTRIAL CHEMISTRY.

A four years' course in industrial chemistry will be started at the Cooper Union for the Advancement of Science and Art, New York City, on October 4, 1920. It will be a day course, and the intention is to make it practical as well as scientific, so that the young men and women who take it will be fully equipped as analysts, production foremen, research chemists, engineers, factory superintendents, purchasing agents, and for any pursuits that require chemical training. At the same time the proper foundation will be provided for those whose aim is original research and productive scholarship in industrial lines.

In the academic year 1920-1921 only the first year subjects will be offered. Horace G. Byers, head of the chemistry department of Cooper Union will supervise the course. He will be assisted by the staff, by such added instructors and lecturers as may be necessary, and by Dr. Maximilian Toch, recently appointed adjunct professor of applied chemistry in Cooper Union.

Pneumatic Tire Tread Designs.

October, 1917, to August, 1918.



Cut No.	Patent No.	Patentee or Assignee and Address.
(1).	51,072.	Perfection Tire & Rubber Co., Chicago, Ill.
(2).	51,184.	The Gordon Tire & Rubber Co., Canton, Ohio.
(3).	51,193.	R. F. America, Philadelphia, Pa.
(4).	51,230.	C. A. Goetze, Minneapolis, Minn.
(5).	51,231.	C. A. Goetze, Minneapolis, Minn.
(6).	52,054.	The Dreadnaught Tire & Rubber Co., Orangeville, Md.
(7).	52,055.	F. M. Hale and F. C. McLaughlin, Kent, Ohio.
(8).	52,062.	J. B. McDevitt and M. Greenspan, Chicago, Ill.
(9).	52,067.	J. Tenney, Jr., Plainfield, N. J.
(10).	51,391.	A. L. Pearce, Philadelphia, Pa.
(11).	51,370.	A. A. Garthwaite, Conshohocken, Pa.
(12).	51,346	G. H. Lewis, Chicopee Falls, Mass.
(13).	51,683.	The Mason Tire & Rubber Co., Kent, Ohio
(14).	51,697	Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.
(15).	51,898.	Hewitt Rubber Co., Buffalo, N. Y.
(16).	51,899.	Hewitt Rubber Co., Buffalo, N. Y.
(17).	51,975.	W. A. Stevens, San Francisco, Calif.
(18).	51,413.	G. W. Greene, East Liverpool, Ohio.
(19).	51,418.	C. L. Landon, Akron, Ohio.
(20).	51,423.	W. H. Owens, Muskogee, Okla.
(21).	51,428.	C. L. Archer, Minneapolis, Minn.
(22).	51,429	C. L. Archer, Minneapolis, Minn.
(23)	51,435.	W. C. Beckwith, Fostoria, Ohio.
(24).	51,452.	W. C. Beckwith, Fostoria, Ohio.
(25).	51,736.	Para Tire Co., New York City.
(26).	51,746.	The East Palestine Rubber Co., East Palestine, Ohio.
(27).	51,747.	The East Palestine Rubber Co., East Palestine, Ohio.
(28).	51,783.	Gryphon Rubber & Tire Corp., New York City.
(29).	51,829.	T. J. Whalen, New Castle, Penna.
(30).	51,499.	C. L. Archer, Minneapolis, Minn.
(31).	51,512.	G. F. Kreitlein, Indianapolis, Ind.
(32).	51,522.	The Akron Biltwell Tire & Rubber Co., Akron, Ohio.
(33).	51,528.	The Brunswick-Balke-Collender Co., Chicago, Ill.
(34).	51,994.	Ajax Rubber Co., New York City.
(35).	51,996.	C. A. Shriver, Toledo, Ohio.
(36).	52,026.	J. Froehlich, New York City.
(37).	52,027.	The Fisk Rubber Co., Chicopee Falls, Mass.
(38).	51,866.	The B. F. Goodrich Co., New York City.
(39).	51,867.	The B. F. Goodrich Co., New York City.
(40).	51,895.	G. S. Towne, San Francisco, Calif.
(41).	51,917.	W. Bruess, Sandusky, Ohio.
(42).	51,939.	The Goodyear Tire & Rubber Co., Akron, Ohio.
(43).	51,544.	P. D. Beck, Lawrence, Kan.
(44).	51,546.	W. B. Buckley, Overbrook, Penna.
(45).	51,555.	Michelin Tire Co., Milltown, N. J.
(46).	51,616.	Giant Tire & Rubber Co., Akron, Ohio.
(47).	51,580.	The Mutual Motor Stores Co., Cleveland, Ohio.

Review of the Crude Rubber Market.

NEW YORK.

THE LEADING FEATURES of the crude rubber market for the past month have been dullness and decline. Manufacturers have exhibited very little interest in the various market positions and have bought only in small lots. Large manufacturers have been more interested in the fabric than in the rubber situation.

Industrial operations generally have been seriously hampered by the long continued series of railroad strikes, car shortages and freight embargoes. These conditions have lessened demand as well as production in all lines and are the basic reasons for the lack of interest in crude rubber. A marked example of this is seen in the fact that transportation difficulties in the movement of raw materials and finished goods have forced rubber manufacturers in the Akron district to curtail their output practically 50 per cent by stopping work on Saturdays and discontinuing the night shift completely.

There has been some buying activity among crude rubber dealers who have been securing spot rubber to cover contracts as the market sagged off. Early in the month there was a large quantity of ribbed smoked sheets in New York, much of it shipped in from London storage.

The rubber markets in London and the Far East ruled firmer and higher than that in New York, where the impression has prevailed that large stocks of crude rubber in the hands of manufacturers and the congestion of shipping facilities will operate to send rubber prices lower. Prices for plantation and South American rubber at the beginning and toward the end of the month are shown in the following quotations:

PLANTATIONS. May 1, first latex crêpe, spot, 43¼ cents; May-June, 44 cents; July-September, 44-45 cents; July-December, 45-46 cents; October-December, 45¾ cents; January-June, 1921, 47-47¼ cents.

May 24, spot, 39 cents; May-June, 39 cents; July-September, 40 cents; October-December, 42½ cents; January-June, 1921, 44½-45 cents.

May 1, ribbed smoked sheets, spot, 43 cents; May-June, 43½ cents; July-September, 39¾-40¼ cents; July-December, 45½ cents; January-June, 1921, 47 cents; May 24, spot, 38½ cents; May-June, 38½ cents; July-September, 38¾-40¼ cents; October-December, 42¾ cents; January-June, 1921, 44¾ cents.

May 1, No. 1 amber crêpe, spot, 45 cents; May-June, 43 cents; July-December 43 cents; May 24, spot and futures, 38 cents.

May 1, No. 1 rolled brown crêpe spot, 34-35 cents; May-June, 33 cents; May 24, spot and futures, 30 cents.

SOUTH AMERICAN PARÁS AND CAUCHO. May 1, spot prices, upriver fine, 41¼ cents, islands fine, 42 cents; upriver coarse, 31 cents; islands coarse, 22 cents; Cameta coarse, 21 cents; caucho ball, 31½ cents. May 24, upriver fine, 39 cents; islands fine, 40½ cents; upriver coarse, 28½ cents; islands coarse, 21 cents; Cameta coarse, 22 cents; caucho ball, 30½ cents.

NEW YORK QUOTATIONS.

Following are the New York spot quotations, for one year ago, one month ago, and May 25, the current date:

	June 1, 1919.	May 1, 1920.	May 25, 1920.
PLANTATION HEVEA—			
First latex crêpe	$0.46 @.47	$0.42½ @.43	$0.38 @.39
Amber crêpe No. 1	.44 @	.44 @.45	.38 @.38½
Amber crêpe No. 2	.43 @	.43 @	.37 @.37½
Amber crêpe No. 3	.42 @	.42 @	.36 @.36½
Amber crêpe No. 4	.41 @	.41 @	.35 @
Brown crêpe, thick and thin clean	.41 @	.42 @	.35 @.36
Brown crêpe, thin specky	@	.39 @	.30 @
Brown crêpe, rolled	$0.32 @	$0.34 @	$0.30 @
Smoked sheet, ribbed, standard quality	.45 @.46	.42½ @.43	.38 @.38½
Smoked sheets, plain, standard quality	.43 @.44	.40 @	.36½ @.37½
Unsmoked sheet, standard quality	.42 @.43	@	.35 @
Colombo scrap No. 1	.32 @	.35 @	.30 @
Colombo scrap No. 2	.29 @.30	.32 @	.28 @
EAST INDIAN—			
Assam crèpe	@	@	@
Assam onions	@	@	@
Penang block scrap	.39 @	@	@
PONTIANAK—			
Banjermassin	.14 @.15	.13 @	.12 @
Palembang	@	@	.13 @
Pressed block	.16 @.17	.25 @	.25 @
Sarawak	.12 @.14	@	@
SOUTH AMERICAN—			
PARÁS—			
Upriver fine	.56½ @	.42 @	.39½ @
Upriver medium	.52 @	.39 @	.37 @
Upriver coarse	.34 @	.31 @	.30 @
Upriver weak, fine	.44 @	.36 @	.36 @
Islands, fine	.47 @	*.41½ @	.40½ @.41
Islands, medium	.43 @	*.38 @	.38 @
Islands, coarse	.21 @	.22 @	*.22 @
Cametá, coarse	.22 @	.22 @	*.22 @
Madeira, fine	@	.44 @	.43 @
Acre Bolivian, fine	@	.42½ @	.41 @
Peruvian fine	.53½ @	.40 @	.37 @
Tapajos fine	.53½ @	.40 @	.38 @
CAUCHO—			
Lower caucho ball	@	.29 @	.28 @
Upper caucho ball	.34½ @	.32½ @	.30½ @.31
MANICOBAS—			
Ceara negro heads	.36 @	*.33 @	.32 @
Ceara scrap	.32 @	*.30 @	.26 @
Manicoba, 30% guarantee	.34 @	*.30 @.33	.30 @
Mangabeira thin sheet	.38 @	.31 @	.30 @.31
CENTRALS—			
Corinto scrap	.32 @	.29 @.30	.25 @.26
Esmeralda sausage	.32 @	.29 @.30	.25 @.26
Central scrap	.31 @	@	.25 @.26
Central scrap and strip	.29 @	.27 @.28	.23 @.24
Central wet sheet	.23 @	.19 @	.18 @.19
Guayule, 20% guarantee	.28 @	.28 @	.27 @
Guayule, washed and dried	.40 @	.38 @	.37 @
AFRICANS—			
Niger flake, prime	.23 @	.18 @	.17 @
Benguela, extra No. 1, 28%	.32 @	.25 @	.18 @
Benguela, No. 2, 32½%	.30 @	.21 @	.15 @
Congo prime, black upper	*.42 @	.37 @	.36 @
Congo prime, red upper	*.40 @	.33 @	.20 @
Kassai black	@	@	.36 @
red	@	.35 @	.22 @
Rio Nunez ball	*.50 @	.36 @	.35 @
Rio Nunez sheets and strings	*.50 @	.34 @	.34 @
Conakry niggers	*.50 @	.34 @	.33 @
Massai sheets and strings	*.50 @	.34 @	.33 @
GUTTA PERCHA—			
Gutta Siak	.24 @	.30 @.31	.29 @
Red Macassar	3.15 @	2.70 @	2.60 @
BALATA—			
Block, Ciudad Bolivar	.80 @.85	.67 @.68	.70 @
Colombia	.60 @.62	.53 @.54	.50 @.52
Panama	.40 @.45	.48 @.50	.48 @
Surinam sheet	1.00 @	.84 @	.84 @
amber	1.03 @	.86 @	.86 @

*Nominal.

RECLAIMED RUBBER.

Owing to congested transportation conditions deliveries of reclaimed to the rubber manufacturers have been much curtailed during both April and May. Overdue stocks are now urgently sought and buying for future delivery has practically ceased for the time being.

Reclaimers have been forced by exhaustion of their fuel supplies to curtail operations or cease for weeks at a time. Conditions are now improving and the mills are resuming work as rapidly as possible under the circumstances.

NEW YORK QUOTATIONS.

May 25, 1920.

Prices subject to change without notice.

Standard reclaims:			
Floating	$0.30	@	$0.35
Friction	.30	@	.35
Mechanical	.12½	@	.13½
Red	.23	@	.24
Shoe	.16	@	.16½
Tires, auto	.16	@	.17
truck	.13	@	.14
White	.22	@	.25

COMPARATIVE HIGH AND LOW NEW YORK SPOT RUBBER PRICES.

	May.								
PLANTATIONS:	[1]1920.			1919.			1918.		
First latex crêpe	$0.43¼	@	$0.38	$0.48	@	$0.45½	$0.68½	@	$0.63
Smoked sheet ribbed	.43¼	@	.37¼	.47	@	.44½	.68½	@	.62
PARAS:									
Upriver, fine	.41	@	.38¼	.56¼	@	.56	.68	@	
Upriver, coarse	.30	@	.28½	.34¾	@	.34	.42	@	.38
Islands, fine	.40½	@	.40	.47½	@	.47	.59	@	.55½
Islands, coarse	.21	@		.21½	@		.28	@	.27
Cametá	.23	@	.22	.23	@	.21½	.28	@	

[1]Figured to May 25, 1920.

THE MARKET FOR COMMERCIAL PAPER.

In regard to the financial situation, Albert B. Beers, broker in crude rubber and commercial paper, No. 1 Liberty street, New York City, advises as follows:

"During May the demand for commercial paper has been rather limited, and entirely from out-of-town banks, rates on the best rubber names ruling at 7½ per cent, and those not so well known 7¾ per cent, with occasional transactions at 8 per cent."

SINGAPORE RUBBER MARKET.

GUTHRIE & CO., LIMITED, Singapore, report [April 1, 1920]:

The usual weekly auctions which opened yesterday were marked by a further decline in prices following advices of declines in the London and New York markets. Fine pale crêpe sold at up to 91½ cents (one lot realized 92 cents) or 4½ cents lower than last week while ribbed smoked sheet in selling at up to the same figure showed a decline of no less than 9 cents. Two lots sold at 92½ cents, and two lots at 92 cents. The lower grades showed reductions of from 3½ to 11 cents. The quantity catalogd was 1,235 tons, of which 767 tons were offered, but 387 tons only were sold.

The following is the course of values:

	In Singapore, per Pound.[1]			Sterling Equivalent per Pound in London.		
Sheet, fine ribbed smoked	88½c	@	91½c	2/ 3¼	@	2/ 4⅛
Sheet, good ribbed smoked	80	@	88	2/ 0⅞	@	2/ 3⅛
Crêpe, fine pale	88	@	91½	2/ 3⅝	@	2/ 4⅝
Crêpe, good pale	80	@	87½	2/ 1⅜	@	2/ 3½
Crêpe, fine brown	76½	@	82	2/ 0⅜	@	2/ 1⅞
Crêpe, good brown	70	@	76½	1/10½	@	2/ 0⅜
Crêpe, dark	57½	@	72	1/ 7	@	1/11⅛
Crêpe, bark	45	@	57	1/ 3½	@	1/ 6⅞

[1]Quoted in Straits Settlements currency; $1 = $0.567 United States currency.

ANTWERP RUBBER MARKET.

GRISAR & CO., Antwerp, report [April 23-28, 1920]:

The market continues depressed on account of the lack of United States orders. Prices are nominal. About 35 tons of Sumatra plantation crêpe I and sheet were sold at 14.50 francs. The stock on hand today is about 674 tons.

The future market opened quiet with falling prices. Today the tone is firmer and prices quoted show a rise of from 0.05 to 0.25 francs on the lowest prices of the week. Dealings amounted to 115,000 kilograms. The price quoted today at closing was 14.10 francs.

The sale of April 28 gave very satisfactory results. Out of 448 tons offered (435 tons Congos and 13 tons Plantation) 390 tons were sold at an average advance of about 0.50 francs for Congos and 0.74 francs for plantation. There was competition for the black sorts and up to 10 francs was paid for 12 tons of black Kassai (taxed 8.90 francs), which means 1 10 francs above valuations. Prime red Congos were also in good demand and upper Congo Yakoma was sold at 8 25 francs.

The principal sales were: Black Kassai, fine quality, 9 to 10 francs; upper Congo, ordinary red, 8 75 to 9.50 francs; upper Congo, Aruwimi, 8.50 to 9.75 francs; Kassai Loanda, strips, 5 75 to 6 francs.

AMSTERDAM RUBBER MARKET.

JOOSTEN & JANSSEN, Amsterdam, report [April 30, 1920]:

During the present week business has again been slow, as the influence of the strike, only just finished, is still to be felt. Many of the lots already in port were sold at the beginning of the strike and must now be delivered; as to the parcels not yet sold, owners wish to dispose of same in the inscriptions which will be taken up again at an early date. The sudden rise in the London market had little influence, the only consequence being a strengthening of the owners' attitude to ask prices far above the market. The firmer reports from the foreign markets lead to a little turn-over on our terminal market, at slowly rising prices.

PLANTATION RUBBER EXPORTS FROM JAVA.

	February.		Two Months Ended February.	
	1919.	1920.	1919.	1920.
To Netherlands ... *kilos*	....	279,000	....	598,000
Great Britain	200,000	862,000	846,000	1,010,000
United States	1,748,000	2,233,000	3,171,000	3,277,000
Singapore	393,000	349,000	931,000	740,000
Japan	40,000	29,000	67,000	29,000
Other countries	180,000	....	217,000	....
Totals	2,561.000	3,752,000	5,232.000	5,654,000
Ports of origin:				
Tandjong Priok	1,620,000	2,054,000	2,952,000	2,583,000
Samarang	....	58,000	22,000	132,000
Soerabaya	819.000	1,621,000	2,030,000	2,692,000

(Compiled by Division of Commerce and Industry, Buitenzorg, Java.)

EXPORTS OF CRUDE RUBBER FROM BELAWAN (DELI), SUMATRA.

	February.		Two Months Ended February.	
	1919.	1920.	1919.	1920.
To Netherlands ... *kilos*	....	203,375	....	452,285
Great Britain	198,172	317,497	257,744	500,443
Belgium	756,546	....	988,260	95
United States	24,506	902,275	42,938	1,899,211
Penang	1,179,397	25,304	3,017,399	109,221
Singapore	980	313,737	980	694,873
Totals	2,159,601	1,762,188	4,307,321	3,656,128

UNITED STATES CRUDE RUBBER IMPORTS FOR 1920 (BY MONTHS).

1920.	Plantations.	Parás.	Africans.	Centrals.	Guayule.	Maniçoba and Matto Grosso.	Totals, 1920.	1919.
January *tons*	17,799	2,620	821	111	...	...	21,351	7,235
February	29,681	2,456	558	265	34	...	32,994	17,456
March	28,533	2,463	514	23	114	3	31,650	28,223
April*	21,036	1,893	628	29	79	10	23,675	28,146
Totals	97,049	9,432	2,521	428	227	13	109,670	81,050

*Also in April, balata 22 tons; miscellaneous gums 812 tons; waste 448 tons.

(Compiled by The Rubber Association of America, Inc.)

FEDERATED MALAY STATES RUBBER EXPORTS.

An official report from Kuala Lumpur states that the export of plantation rubber from the Federated Malay States in the month of March amounted to 9,524 tons, as against 9,781 tons in February and 10,679 tons in the corresponding month last year. The total export for the first quarter of the year is 30,424 tons, compared with 28,651 tons for the same period last year, and 22,117 tons in 1918. Appended are the comparative statistics:

	1918.	1919.	1920.
January ... *tons*	7,588	7,163	11,119
February	6,820	10,809	9,781
March	7,709	10,679	9,524
Totals	22,117	28,651	30,424

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official report from Singapore reports that 5,931 tons of rubber were exported from Straits Settlements ports in the month of March, compared with 17,379 tons in February and 20,908 tons in the corresponding month last year. Transhipments for March amounted to 1,340 tons. For three months of the present year the exports amounted to 36,435 tons against 50,973 tons last year and 15,494 tons in 1918. Appended are the comparative statistics:

	1918.	1919.	1920.
January ... *tons*	4,302	14,404	13,125
February	2,334	15,661	17,379
March	8,858	20,908	5,931
Totals	15,494	50,973	36,435

CEYLON RUBBER IMPORTS AND EXPORTS.

IMPORTS.

	January 1 to March 29.	
	1919.	1920.
Crude rubber:		
From Straits Settlements ... *pounds*	577,342	807,814
India	462,047	547,666
Burma and other countries	....	6,300
Totals	1,039,389	1,363,583

EXPORTS.

	1919.	1920.
Crude rubber:		
To United Kingdom	7,560,384	8,935,040
Belgium	....	18,360
France	285,100	80,640
Germany	....	81,348
Italy	....	67,200
Australia	62,742	20,191
United States	23,597,234	9,191,022
Canada and Newfoundland	....	257,600
India	1,612	....
Straits Settlements	424	....
Japan	105,320	13,492
Totals	31,612,816	18,664,893

(Compiled by the Ceylon Chamber of Commerce.)

CRUDE RUBBER ARRIVALS AT ATLANTIC AND PACIFIC PORTS AS STATED BY SHIPS' MANIFESTS.

PARAS AND CAUCHO AT NEW YORK.

	Fine.	Medium.	Coarse.	Caucho.	Totals. Pounds.
April 23. By the S. S. *Hubert*, from Iquitos, Itacoatiara, Manáos and Pará.					
Paul Bertuch	......	......	......	69,440	69,440
Meyer & Brown, Inc.	78,400	......	4,480	......	82,880
H. A. Astlett & Co.	127,300	......	162,300	173,900	463,500
Wm Schall & Co.	68,402	......	2,610	......	71,012
Hagemeyer Trading Co.	114,000	......	......	......	114,000
Poel & Kelly	......	......	......	......	41,744
G. Amsinck & Co., Inc.	......	......	......	......	79,772
General Rubber Co.	......	......	......	......	71,638
Namburg & Co.	......	......	......	......	11,760
Various	......	......	......	......	280,570
April 23. By the S. S. *Hubert*, in transit for Bolivia.					
Wm. Seebal & Co.	......	......	......	......	106,428
F. R. Henderson & Co.	......	......	......	......	11,270
Neuss, Hesslein & Co.	......	......	......	......	9,800
G. Amsinck & Co., Inc.	......	......	......	......	8,526
April 28. By the S. S. *Byron*, from Pará.					
Meyer & Brown, Inc.	64,960	......	......	13,440	78,400
May 1. By the S. S. *Michael*, from Iquitos, Pará and Manáos.					
Paul Bertuch	......	......	......	......	160,257
Meyer & Brown, Inc.	......	......	......	......	1,960
Hagemeyer & Brunn	346,000	......	......	56,000	402,000
Thornett & Fehr, Inc.	......	......	......	......	13,146
Poel & Kelly	......	......	......	......	14,014
G. Amsinck & Co., Inc.	......	......	......	......	13,034
H. A. Astlett & Co.	100,300	......	26,100	288,800	415,200
Various	......	......	......	......	280,570
May 1. By the S. S. *Alban*, from Manáos and Pará.					
Poel & Kelly	......	......	......	......	12,250
Raw Products Co.	......	......	......	......	784
Paul Bertuch	......	......	......	......	44,690
H. A. Astlett & Co.	112,023	......	67,000	116,000	295,023
G. Amsinck & Co., Inc.	......	......	......	......	21,166
Gosho Co., Inc.	......	......	......	......	568
Thornett & Fehr, Inc.	......	......	......	......	21,166
Wm. Schall & Co.	10,254	......	4,469	15,749	30,472
Neuss, Hesslein & Co.	......	......	......	......	32,144
Meyer & Brown, Inc.	......	......	......	47,600	47,600
Hagemeyer & Brunn	50,000	......	......	43,226	93,226

PLANTATIONS.

(*Figured* 180 *pounds to the bale or case.*)

	Shipment from:	Shipped to:	Pounds.	Totals.
April 22. By the S. S. *West Amargosa*, at New York.				
L. Littlejohn & Co., Inc.	East	New York	672,000	
J. T. Johnstone & Co., Inc.	Batavia	New York	49,280	
Edward Maurer Co., Inc.	Batavia	New York	57,420	
Vernon Metal & Produce Co.	Batavia	New York	44,100	
Winter, Ross & Co.	Batavia	New York	41,220	
The Goodyear Tire & Rubber Co.	Batavia	Akron	88,920	
Various	Batavia	New York	195,840	
Poel & Kelly	Singapore	New York	302,580	
Mitsui & Co., Limited	Singapore	New York	40,320	
Heidelbach, Ickleheimer & Co.	Singapore	New York	260,100	
Meyer & Brown, Inc.	Singapore	New York	280,000	
Various	Singapore	New York	428,660	2,463,430
April 22. By the S. S. *Tyndareus*, at Seattle.				
Various	Hongkong	Seattle	135,720	135,720
April 23. By the S. S. *Port Borneo*, at New York.				
Thornett & Fehr, Inc.	Liverpool	New York	26,280	
The B. F. Goodrich Co.	Liverpool	Akron	39,600	
Poel & Kelly	Liverpool	New York	1,080	
Various	Liverpool	New York	355,340	420,300
April 23. By the S. S. *Menominee*, at New York.				
Various	Liverpool	New York	720	720
April 24. By the S. S. *Costigan*, at New York.				
Aldens' Successors, Inc.	Singapore	New York	122,400	
Fred Stern & Co.	Singapore	New York	20,520	
F. R. Henderson & Co.	Singapore	New York	74,880	
L. Littlejohn & Co., Inc.	Singapore	New York	179,200	
The B. F. Goodrich Co.	Singapore	Akron	202,320	
Meyer & Brown, Inc.	Singapore	New York	224,000	
The Fisk Rubber Co.	Batavia	Chicopee Falls	147,420	
Various	Batavia	New York	221,580	
Various	Singapore	New York	670,260	1,862,580
April 29. By the S. S. St. *Paul*, at New York.				
The Goodyear Tire & Rubber Co.	London	Akron	94,320	94,320
April 29. By the S. S. *Minnesota*, at New York.				
T. D. Downing & Co.	London	New York	106,020	
The B. F. Goodrich Co.	London	Akron	29,160	
Various	London	New York	398,520	533,700
April 30. By the S. S. *Mesaba*, at New York.				
General Rubber Co.	London	New York	156,600	
Meyer & Brown, Inc.	London	New York	112,000	268,600
May 1. By the S. S. *Valdura*, at New York.				
The B. F. Goodrich Co.	London	Akron	2,520	
Poel & Kelly	London	New York	263,160	
Thornett & Fehr, Inc.	London	New York	116,100	
General Rubber Co.	London	New York	1,293,660	
T. D. Downing & Co.	London	New York	126,900	
L. Littlejohn & Co., Inc.	London	New York	2,220	
Various	London	New York	1,120,380	2,924,940
May 1. By the S. S. *Kansas*, at New York.				
United Overseas Co.	Colombo	New York	30,420	
J. M. Duche & Sons	Colombo	New York	26,640	
Winter, Ross & Co.	Colombo	New York	19,800	
Chas. T. Wilson Co., Inc.	Colombo	New York	274,500	
Rogers-Pyatt Shellac Co.	Colombo	New York	26,640	
Thornett & Fehr, Inc.	Colombo	New York	68,760	
The Goodyear Tire & Rubber Co.	Colombo	Akron	90,000	
L. Littlejohn & Co., Inc.	Colombo	New York	178,020	
F. W. Frost & Co., Inc.	Colombo	New York	47,520	
United States Rubber Co.	Colombo	New York	225,000	
Firestone Tire & Rubber Co.	Colombo	Akron	49,680	
Poel & Kelly	Colombo	New York	54,180	
Various	Colombo	New York	175,320	1,266,480
May 2. By the *Inkula*, at Portland, Maine.				
Meyer & Brown, Inc.	London	New York	40,320	40,320
May 3. By the S. S. *Astyanax*, at New York.				
L. Littlejohn & Co., Inc.	Java	New York	365,120	365,120
May 3. By the S. S. *Aymeric*, at New York.				
L. Littlejohn & Co., Inc.	Colombo	New York	78,400	78,400
May 3. By the S. S. *Glenshane*, at New York.				
United States Rubber Co.	Colombo	New York	135,000	
Edward Bonstead & Co.	Singapore	New York	45,000	
Thornett & Fehr, Inc.	Singapore	New York	40,050	
Poel & Kelly	Singapore	New York	193,800	
F. R. Henderson & Co.	Singapore	New York	42,600	
General Rubber Co.	Singapore	New York	321,000	
Mitsui & Co., Limited	Singapore	New York	84,000	
Vernon Metal & Produce Co.	Singapore	New York	16,800	
Raw Products Co.	Singapore	New York	24,000	
Rubber Importers & Dealers' Co., Inc.	Singapore	New York	50,400	
Konig Bros. & Co.	Singapore	New York	11,100	
Various	Singapore	New York	175,950	
The Goodyear Tire & Rubber Co.	Penang	Akron	72,000	
Thornett & Fehr, Inc.	Penang	New York	33,150	1,244,850
May 5. By the S. S. *Ariosto*, at New York.				
Poel & Kelly	Singapore	New York	259,560	
F. R. Henderson & Co.	Singapore	New York	561,600	
L. Littlejohn & Co., Inc.	Singapore	New York	403,200	
Vernon Metal & Produce Co.	Singapore	New York	49,500	
William H. Stiles & Co.	Singapore	New York	119,340	
Meyer & Brown, Inc.	Singapore	New York	100,800	
Rubber Trading Co.	Singapore	New York	50,400	
Chas. T. Wilson Co., Inc.	Singapore	New York	108,000	
Winter, Ross & Co.	Singapore	New York	19,080	
Balfour, Williamson & Co.	Singapore	New York	39,780	
United Malaysian Rubber Co., Limited	Singapore	New York	46,980	
Thornett & Fehr, Inc.	Singapore	New York	169,380	
Aldens' Successors, Inc.	Singapore	New York	41,900	
Pell & Dumont, Inc.	Singapore	New York	201,600	
General Rubber Co.	Singapore	New York	475,020	
Mitsui & Co., Limited	Singapore	New York	32,760	
Fred Stern & Co.	Singapore	New York	72,020	
J. T. Johnstone & Co., Inc.	Singapore	New York	102,100	
Firestone Tire & Rubber Co.	Singapore	Akron	188,820	

	Shipment from:	Shipped to:	Pounds.	Totals.
Hood Rubber Co........	Singapore	Watertown	54,000	
East Asiatic Co., Inc...	Medan	New York	4,500	
The Fisk Rubber Co....	Medan	Chicopee Falls	92,880	
The B. F. Goodrich Co..	Penang	Akron	5,580	
Aldens' Successors, Inc.	Penang	New York	39,600	
F. R. Henderson & Co..	Penang	New York	134,640	
L. Littlejohn & Co., Inc.	Penang	New York	29,700	
William H. Stiles & Co..	Penang	New York	49,500	
Mitsui & Co., Limited...	Penang	New York	27,040	
C. F. McPhillips.......	Penang	New York	28,440	
Thornett & Fehr, Inc...	Penang	New York	10,080	
Various	Singapore	New York	839,520	
Various	Medan	New York	51,120	
Various	Penang	New York	164,880	4,573,320

MAY 6. By the S. S. *Shinkoku Maru*, at New York.

L. Sutro & Co........	Colombo	New York	258,480	
Chas. T. Wilson Co., Inc.	Colombo	New York	38,700	
United States Rubber Co.	Colombo	New York	117,000	
U. T. Sargent & Sons..	Colombo	New York	23,040	
Poel & Kelly...........	Colombo	New York	193,860	
Firestone Tire & Rubber Co.	Colombo	Akron	9,720	
L. Littlejohn & Co., Inc.	Colombo	New York	89,600	730,400

MAY 6. By the S. S. *Seekonk*, at New York.

L. Littlejohn & Co., Inc.	Colombo	New York	134,000	
Poel & Kelly...........	Colombo	New York	25,050	
L. Littlejohn & Co., Inc.	Colombo	New York	95,250	
Various	Colombo	New York	33,600	288,300

MAY 7. By the S. S. *Celtic*, at New York.

General Rubber Co.....	Liverpool	New York	117,750	117,750

MAY 7. By the S. S. *Villavia*, at New York.

Poel & Kelly...........	Liverpool	New York	25,380	
R. F. Downing & Co....	Liverpool	New York	11,880	
Various	Liverpool	New York	1,080	38,340

MAY 7. By the S. S. *Buitenzorg*, at New York.

G. Amsinck & Co., Inc..	Penang	New York	7,740	
Various	Penang	New York	27,000	
L. Littlejohn & Co., Inc.	Java	New York	246,400	
Aldens' Successors, Inc.	Soerabaya	New York	88,200	
Various	Soerabaya	New York	219,060	
L. Littlejohn & Co., Inc.	T'jong Priok	New York	17,640	
The Goodyear Tire & Rubber Co.	T'jong Priok	Akron	54,000	
Rubber Trading Co.....	Singapore	New York	33,600	
Various	T'jong Priok	New York	1,110,060	1,803,700

MAY 10. By the S. S. *City of Hankow*, at New York.

L. Littlejohn & Co., Inc.	Colombo	New York	152,800	
Poel & Kelly...........	Colombo	New York	157,840	
United States Rubber Co.	Colombo	New York	316,980	
Firestone Tire & Rubber Co.	Colombo	Akron	9,360	
Meyer & Brown, Inc....	Colombo	New York	22,400	
Chas. T. Wilson Co., Inc.	Colombo	New York	113,580	
Overseas Export & Import Co.	Colombo	New York	36,180	
Rubber Importers & Dealers Co., Inc..........	Colombo	New York	23,760	
Rogers-Pyatt Shellac Co.	Colombo	New York	14,400	
Thornett & Fehr, Inc...	Colombo	New York	61,920	
C. F. McPhillips........	Colombo	New York	80,640	
The B. F. Goodrich Co..	Colombo	Akron	27,360	
The Goodyear Tire & Rubber Co.	Colombo	Akron	125,820	
E. S. Kuh & Valk Co..	Colombo	New York	25,200	
Vernon Metal & Produce Co.	Colombo	New York	46,800	
Various	Colombo	New York	579,780	1,794,820

MAY 10. By the S. S. *Tjisondari*, at San Francisco.

The Goodyear Tire & Rubber Co.	Batavia	Akron	65,520	
Aldens' Successors, Inc.	Soerabaya	New York	46,440	
Various	Soerabaya	New York	69,660	
Various	Batavia	Akron	12,240	193,860

MAY 10. By the S. S. *Hague Maru*, at New York.

Raw Products Co........	Singapore	New York	90,000	
F. R. Henderson & Co..	Singapore	New York	669,320	
Everett, Heaney & Co..	Singapore	New York	47,880	
Rubber Trading Co.....	Singapore	New York	33,600	
L. Littlejohn & Co., Inc.	Singapore	New York	201,600	
Meyer & Brown, Inc....	Singapore	New York	94,500	
Chas. T. Wilson Co., Inc.	Singapore	New York	686,520	
G. Kawahara Co.	Singapore	New York	410,220	
Mitsui & Co., Ltd......	Singapore	New York	100,800	
Thornett & Fehr, Inc...	Singapore	New York	91,080	
Henderson, Forbes & Co.	Singapore	New York	28,800	
The Goodyear Tire & Rubber Co.	Singapore	Akron	39,420	
Vernon Metal & Produce Co.	Singapore	New York	45,000	
Firestone Tire & Rubber Co.	Singapore	New York	705,600	
Various	Singapore	New York	656,640	3,900,980

MAY 10. By the S. S. *Chipana*, at New York.

Arthur Meyer & Co., Ltd.	London	New York	9,720	
General Rubber Co.....	London	New York	473,380	
Adolph Hirsch & Co....	London	New York	247,920	
C. W. Hartrodt & Co., Limited	London	New York	36,360	
Wilson, Holgate & Co., Limited	London	New York	77,400	
Meyer & Brown, Inc....	London	New York	112,000	
Various	London	New York	1,322,280	2,279,060

	Shipment from:	Shipped to:	Pounds.	Totals.

MAY 11. By the S. S. *Suveric*, at New York.

L. Littlejohn & Co., I	East	New York	67,200	

MAY 11. By the S. S. *Philadelphia*, at New York.

Various	London	New York	523,800	523,800

MAY 13. By the S. S. *Amur Maru*, at San Francisco.

Mitsui & Co., Limited..	Singapore	San Francisco	57,000	57,000

MAY 14. By the S. S. *Remouski*, at New York.

Thornett & Fehr, Inc...	London	New York	2,160	
Henry Rogers Winthrop.	London	New York	62,820	
T. D. Downing & Co...	London	New York	73,440	
William Brandt & Sons.	London	New York	221,580	
Various	London	New York	73,440	433,440

MAY 16. By the S. S. *West Ira*, at New York.

Gates Rubber Co.......	Hongkong	Denver	50,400	50,400

MAY 17. By the S. S. *Ceylon Maru*, at New York.

L. Littlejohn & Co., Inc.	Colombo	New York	89,600	
Various	Colombo	New York	195,660	285,260

MAY 17. By the S. S. *Minnekahda*, at New York.

Meyer & Brown, Inc...	London	New York	44,800	
Various	London	New York	9,540	54,340

MAY 17. By the S. S. *Noordam*, at New York.

L. Littlejohn & Co., Inc.	Java	New York	224,000	224,000

MAY 17. By the S. S. *Caronia*, at New York.

General Rubber Co.....	Liverpool	New York	172,980	
Thornett & Fehr, Inc..	Liverpool	New York	24,480	
Irwin-Harrisons & Crosfield, Inc.	Liverpool	New York	11,160	208,620

MAY 17. By the S. S. *Baltic*, at New York.

The B. F. Goodrich Co.	Liverpool	Akron	42,120	
Various	Liverpool	New York	1,800	43,920

MAY 18. By the S. S. *Tiger*, at New York.

Mitsui & Co., Limited..	Batavia	New York	54,000	
The Goodyear Tire & Rubber Co.	Batavia	Akron	50,040	
Winter, Ross & Co.....	Batavia	New York	26,820	
Fred Stern & Co.......	Batavia	New York	16,920	
The Fisk Rubber Co...	Batavia	Chicopee Falls	28,620	
L. Littlejohn & Co., Inc.	Batavia	New York	53,280	
Poel & Kelly..........	Batavia	New York	123,480	
Meyer & Brown, Inc...	Batavia	New York	22,400	
Firestone Tire & Rubber Co.	Batavia	Agron	101,520	
Various	Batavia	New York	186,660	
Mitsui & Co., Limited..	Soerabaya	New York	277,560	
Fred Stern & Co.......	Soerabaya	New York	48,780	
L. Littlejohn & Co., Inc.	Soerabaya	New York	287,820	
Various	Soerabaya	New York	1,980	
Aldens' Successors, Inc.	Singapore	New York	12,600	
Fred Stern & Co.......	Singapore	New York	20,520	
The Goodyear Tire & Rubber Co.	Singapore	Akron	205,200	
Various	Singapore	New York	271,620	
Various	Penang	New York	142,020	
Thornett & Fehr, Inc...	Belawan	New York	40,860	
General Rubber Co.....	Belawan	New York	513,000	
The Goodyear Tire & Rubber Co.	Colombo	Akron	94,680	
Edward Maurer Co., Inc.	Colombo	New York	165,780	
L. Littlejohn & Co., Inc.	Colombo	New York	796,000	
J. Aron & Co..........	Colombo	New York	31,860	
Chas. T. Wilson Co., Inc.	Colombo	New York	428,760	
The B. F. Goodrich Co.	Colombo	Akron	82,260	
Poel & Kelly..........	Colombo	New York	127,800	
Firestone Tire & Rubber Co.	Colombo	Akron	9,540	
United Malaysian Rubber Co., Limited	Colombo	New York	22,320	
Rubber Trading Co.....	Colombo	New York	4,480	
Various	Colombo	New York	684,240	4,933,420

MAY 18. By the S. S. *Moorish Prince*, at New York.

Edward Boustead & Co.	Penang	New York	156,060	
The Goodyear Tire & Rubber Co.	Penang	Akron	57,600	
Thornett & Fehr, Inc...	Penang	New York	79,200	
W. R. Grace & Co......	Penang	New York	49,860	
Various	Penang	New York	210,960	
L. Littlejohn & Co., Inc.	Singapore	New York	275,220	
The B. F. Goodrich Co.	Singapore	Akron	255,600	
Balfour, Williamson & Co.	Singapore	New York	219,060	
Poel & Kelly..........	Singapore	New York	423,540	
Fred Stern & Co.......	Singapore	New York	349,200	
F. R. Henderson & Co..	Singapore	New York	208,440	
C. F. McPhillips.......	Singapore	New York	5,580	
Thos. A. Desmond & Co.	Singapore	New York	201,060	
The Goodyear Tire & Rubber Co.	Singapore	New York	612,900	
Vernon Metal & Produce Co.	Singapore	New York	41,400	
Raw Products Co.......	Singapore	New York	43,200	
Chas. T. Wilson Co., Inc.	Singapore	New York	388,260	
Aldens' Successors, Inc.	Singapore	New York	90,540	
J. Aron & Co..........	Singapore	New York	50,400	
Rogers-Pyatt Shellac Co.	Singapore	New York	30,600	
Mitsui & Co., Limited..	Singapore	New York	73,440	
Thornett & Fehr, Inc...	Singapore	New York	99,000	
Various	Singapore	New York	1,521,180	
L. Littlejohn & Co., Inc.	Pt. Sw't'nh'm	New York	672,000	
Rubber Trading Co....	Singapore	New York	56,000	6,170,300

MAY 18. By the S. S. *Vasconia*, at New York.

Various	London	New York	388,080	388,080

	Shipment from:	Shipped to:	Pounds.	Totals.
MAY 19. By the S. S. *Westra*, at San Francisco.				
Various	Hongkong	San Francisco	50,400	50,400
MAY 20. By the S. S. *Adriatic*, at New York.				
Baring Bros.	London	New York	169,740	169,740
MAY 20. By the S. S. *Antilachus*, at New York.				
Meyer & Brown, Inc...	Singapore	New York	134,000	
United States Rubber Co.	Singapore	New York	474,380	
L. Littlejohn & Co., Inc.	Singapore	New York	201,600	
The Fisk Rubber Co...	Singapore	Chicopee Falls	382,500	
Thos. A. Desmond & Co.	Singapore	New York	189,040	
F. R. Henderson & Co.	Singapore	New York	307,700	
Aldens' Successors, Inc.	Singapore	New York	30,600	
Thornett & Fehr, Inc...	Singapore	New York	46,620	
Poel & Kelly...........	Singapore	New York	4,140	
Edward Maurer & Co., Inc.	Singapore	New York	285,840	
J. T. Johnstone & Co., Inc.	Singapore	New York	50,400	
Rubber Importers & Dealers' Co., Inc.....	Singapore	New York	318,320	
Robinson & Co.........	Singapore	New York	28,080	
Pacific Trading Corp. of America	Singapore	New York	211,500	
The Goodyear Tire & Rubber Co.	Singapore	Akron	950,940	
Various	Singapore	New York	1,269,720	
Balfour, Williamson Co.	Singapore	New York	31,680	
Winter, Ross & Co.....	Singapore	New York	19,440	
Fred Stern & Co.......	Singapore	New York	10,620	
Chas. T. Wilson Co., Inc.	Singapore	New York	86,400	
Eastern Rubber Co.....	Singapore	New York	20,160	
F. R. Henderson & Co..	Pt. Sw't'nh'm	New York	48,420	
Edward Boustead & Co.	Pt. Sw't'nh'm	New York	53,820	
Thornett & Fehr, Inc...	Pt. Sw't'nh'm	New York	52,200	
L. Littlejohn & Co., Inc.	Pt. Sw't'nh'm	New York	138,960	
Various	Pt. Sw't'nh'm	New York	88,200	
Fred Stern & Co.......	Delhi	New York	110,700	
L. Littlejohn & Co., Inc.	Delhi	New York	52,920	
East Asiatic Co., Inc...	Delhi	New York	4,500	
Aldens' Successors, Inc.	Delhi	New York	104,220	
The Fisk Rubber Co....	Delhi	Chicopee Falls	25,740	
Firestone Tire & Rubber Co.	Delhi	Akron	161,300	
Various	Delhi	New York	314,820	
Joosten & Janssen	Penang	New York	27,000	
Pacific Trading Corp. of America	Penang	New York	95,400	
Various	Penang	New York	162,180	6,494,060
MAY 21. By the S. S. *West Neris*, at San Francisco.				
Various	Belawan	San Fran.	583,020	
Various	Singapore	San Fran.	527,320	
Various	Batavia	San Fran.	147,240	
Various	Eastern Cities	San Fran.	1,239,840	2,497,420
MAY 21. By the S. S. *Higho*, at San Francisco.				
Various	Kobe	San Fr'c'co	28,080	28,080

CENTRALS.

APRIL 26. By the S. S. *Pastores*, at New York.				
Isaac Brandon & Bros..	Cristobal	New York	450	450
APRIL 26. By the S. S. *Monterey*, at New York.				
Armendaiz Bros., Inc...	Vera Cruz	New York	4,200	4,200
APRIL 29. By the S. S. *Gen. W. C. Gorgas*, at New York.				
G. Amsinck & Co., Inc..	Cristobal	New York	900	
Hamberger-Polhemus Co.	Cristobal	New York	3,450	
Various	Cristobal	New York	150	4,500
MAY 3. By the S. S. *Colon*, at New York.				
J. S. Sembrada & Co., Inc.	Tumaco	New York	937	937
MAY 4. By the S. S. *Canto*, at New York.				
Harburger & Stack.....	Havana	New York	1,000	1,000
MAY 10. By the S. S. *Cristobal*, at New York.				
G. Amsinck & Co., Inc..	Cristobal	New York	66,150	
J. S. Sembrada & Co...	Cristobal	New York	380	
Andean Trading Co.....	Cristobal	New York	15,000	
Wellman, Peck & Co....	Cristobal	New York	2,100	
Isaac Brandon & Bros...	Cristobal	New York	150	
Various	Cristobal	New York	8,550	92,330
MAY 10. By the S. S. *Ebro*, at New York.				
Ultramares Corp.	Tulenhuano	New York	3,150	3,150
MAY 10. By the S. S. *Gen. Geo. W. Goethals*, at New York.				
Andean Trading Co.....	Cristobal	New York	3,000	
Fidanque Bros. & Sons.	Cristobal	New York	2,250	5,250
MAY 16. By the S. S. *Maraval*, at New York.				
G. Amsinck & Co., Inc.	Port of Spain	New York	21,750	21,750
MAY 17. By the S. S. *Gen. O. H. Ernst*, at New York.				
G. Amsinck & Co., Inc.	Cristobal	New York	8,850	8,850
MAY 20. By the S. S. *Tivives*, at New York.				
Various	Cristobal	New York	1,950	1,950
MAY 21. By the S. S. *Panama*, at New York.				
Wellman, Peck & Co....	Cristobal	New York	150	
G. Amsinck & Co., Inc.	Cristobal	New York	39,150	
J. T. Johnstone & Co., Inc.	Cristobal	New York	21,000	60,300

AFRICANS.

	Shipment from:	Shipped to:	Pounds.	Totals.
APRIL 13. By the S. S. *West Hematite*, at New York.				
A. D. Straus & Co......	Bordeaux	New York	1,001,430	
Poel & Kelly...........	Bordeaux	New York	10,382,040	
Rubber Importers & Dealers' Co., Inc.....	Bordeaux	New York	147,840	
Various	....	....	2,241,200	13,772,510
APRIL 15. By the S. S. *Patria*, at New York.				
C. B. Richards & Co....	Marseilles	New York	90,000	90,000
APRIL 19. By the S. S. *Nilemade*, at New York.				
British & African Trading Co.	Dakar	New York	6,480	6,480
APRIL 19. By the S. S. *Storvicken*, at New York.				
Poel & Kelly...........	Marseilles	New York	4,205	4,205
APRIL 19. By the S. S. *Bereby*, at New York.				
Various	Africa	New York	21,420	21,420
APRIL 19. By the S. S. *McKeesport*, at New York.				
Various	Havre	New York	63,720	63,720
APRIL 19. By the S. S. *Dunkirk*, at New York.				
Various	Beira	New York	1,620	1,620
APRIL 20. By the S. S. *Verbania*, at New York.				
Poel & Kelly...........	Liverpool	New York	91,199	91,199
APRIL 20. By the S. S. *Issawatomie*, at Boston.				
Hood Rubber Co.......	Antwerp	Watertown	111,957	111,957
APRIL 23. By the S. S. *Port Bowen*, at New York.				
Rubber Trading Co.....	London	New York	112,000	
Meyer & Brown, Inc....	Liverpool	New York	11,200	123,200
APRIL 27. By the S. S. *Siberian Prince*, at New York.				
Poel & Kelly...........	Havre	New York	22,500	22,500
APRIL 28. By the S. S. *Kroonland*, at New York.				
Various	Antwerp	New York	139,680	139,680
MAY 3. By the S. S. *Glenshane*, at New York.				
Edward Boustead & Co..	Singapore	New York	7,130	7,130
MAY 4. By the S. S. *Remus*, at New York.				
Various	Bordeaux	New York	22,343	22,343
MAY 4. By the S. S. *Niagara*, at New York.				
Poel & Kelly...........	Havre	New York	2,990	
Huth & Co.............	Havre	New York	106,030	
Joosten & Janssen......	Bordeaux	New York	67,200	176,220
MAY 5. By the S. S. *Vallavia*, at New York.				
Rubber Trading Co.....	London	New York	2,240	2,240
MAY 7. By the S. S. *Buitenzorg*, at New York.				
Rubber Trading Co.....	Singapore	New York	44,800	44,800
MAY 13. By the S. S. *Roma*, at New York.				
Carleton & Mott.......	Marseilles	New York	47,250	
Various	Marseilles	New York	200,445	247,695
MAY 14. By the S. S. *Okesa*, at New York.				
Various	Lisbon	New York	24,315	24,315
MAY 15. By the S. S. *Noordam*, at New York.				
Poel & Kelly...........	Rotterdam	New York	246,780	
Various	Rotterdam	New York	207,180	453,960
MAY 17. By the S. S. *Moorish Prince*, at New York.				
Rubber Trading Co.....	Singapore	New York	159,040	159,040
MAY 17. By the S. S. *Baltic*, at New York.				
Meyer & Brown, Inc....	Liverpool	New York	11,200	11,200
MAY 19. By the S. S. *Okesa*, at New York.				
William Schall & Co....	Portugal	New York	65,462	65,462
MAY 20. By the S. S. *Antilochus*, at New York.				
Joosten & Janssen......	Singapore	New York	33,600	33,600

BALATA.

APRIL 19. By the S. S. *Matura*, at New York.				
Middleton & Co., Limited	Trinidad	New York	1,135	
Middleton & Co., Limited	Demerara	New York	2,942	4,077
MAY 10. By the S. S. *Cristobal*, at New York.				
Neuss, Hesslein & Co...	Cristobal	New York	1,372	
J. S. Sembrada & Co...	Cristobal	New York	1,862	
American Trading Co...	Cristobal	New York	4,802	8,036
MAY 16. By the S. S. *Maraval*, at New York.				
Southern Sales Corp...	Port of Spain	New York	13,622	
Various	Port of Spain	New York	196	13,818
MAY 17. By the S. S. *Yarmouth*, at New York.				
H. Marquardt & Co., Inc.	Kingston	New York	750	750
MAY 20. By the S. S. *Tivives*, at New York.				
Ultramares Corp.	Cristobal	New York	7,350	[illegible]
MAY 21. By the S. S. *Panama*, at New York.				
G. Amsinck & Co., Inc..	Cristobal	New York	[illegible]	
Fidanque Bros. & Sons.	Cristobal	New York	[illegible]	
Hollinghurst & Co......	Cristobal	New York	[illegible]	
Various	Cristobal	New York	[illegible]	[illegible]

PONTIANAK.

	Shipment from:	Shipped to:	Pounds.	Totals.
May 3. By the S. S. *Glenshane*, at New York.				
Various	Singapore	New York	216,000	216,000
May 5. By the S. S. *Aristo*, at New York.				
Poel & Kelly...........	Singapore	New York	57,600	57,600
May 7. By the S. S. *Buitenzorg*, at New York.				
United Malaysian Rubber Co., Limited	Penang	New York	84,000	
Various	Penang	New York	74,400	158,400
May 10. By the S. S. *Hague Maru*, at New York.				
Various	Singapore	New York	29,100	29,100
May 18. By the S. S. *Moorish Prince*, at New York.				
Sanderson & Son.......	Singapore	New York	57,600	
United Malaysian Rubber Co., Limited	Singapore	New York	579,961	
Fred Stern & Co.......	Singapore	New York	24,000	
Baring Bros.	Singapore	New York	116,700	
Various	Singapore	New York	112,500	890,761
May 20. By the S. S. *Antilochus*, at New York.				
Baring Brothers	Singapore	New York	49,200	
E. Everett Carleton & Co.	Singapore	New York	44,700	93,900
May 21. By the S. S. *West Neris*, at San Francisco.				
Various	Singapore	San Franc'co	11,400	11,400

MANICOBAS.

May 12. By the S. S. *Alban*, at New York.				
Various	Ceara	New York	58,740	58,740

GUAYULE.

April 26. By rail at Eagle Pass, Texas.				
Continental-Mexican Rubber Co.	Mexico	Akron	62,150	
Continental-Mexican Rubber Co.	Mexico	New York	52,275	114,425
May 5. By rail at Eagle Pass, Texas.				
Continental-Mexican Rubber Co.	Mexico	New York	115,030	
Continental-Mexican Rubber Co.	Mexico	Akron	55,275	170,305

GUTTA PERCHA.

May 1. By the S. S. *Vardulia*, at New York.				
Various	London	New York	30,600	30,600

GUTTA SIAK.

April 22. By the S. S. *West Amargosa*, at New York.				
Various	Singapore	New York	125,700	125,700
May 18. By the S. S. *Moorish Prince*, at New York.				
United Malaysian Rubber Co., Limited	Singapore	New York	67,200	67,200
May 20. By the S. S. *Antilochus*, at New York.				
United-Malaysian Rubber Co., Limited	Singapore	New York	134,400	134,400

ANTWERP RUBBER ARRIVALS.

April 9, 1920. By S. S. *Mateba*, from the Congo.		
Bungé et Cie........................	*kilos*	7,973
Bungé et Cie (Compagnie du Kassai)........		67,225
Bungé et Cie (Grand Lacs)...........		1,640
Bungé et Cie (Belgika)...........		12,047
Bungé et Cie (Crédit Colonial et Commercial)........		13,875
Various		8,893
Total	*kilos*	111,653
April 9, 1920. By the S. S. *Anversville*, from the Congo.		
Bungé et Cie........................	*kilos*	10,477
Bungé et Cie (Grand Lacs)...........		3,038
Société Coloniale Anversoise (Compagnie du Kassai)........		30,090
Société Coloniale Anversoise (Compagnie Française du Bas Congo)		31,110
Total	*kilos*	74,715

(*Compiled by Grisar & Co., Antwerp.*)

EXPORTS OF INDIA RUBBER FROM PARA MANAOS AND IQUITOS DURING THE MONTH OF MARCH, 1920

	NEW YORK.					EUROPE.					
Exporters.	Fine.	Medium.	Coarse,	Caucho.	Totals.	Fine.	Medium.	Coarse.	Caucho.	Totals.	Grand Totals.
Alfredo Valle & Co..........*kilos*	187,304	5,100	77,300	52,500	322,204	154,420	21,999	6,003	22,751	205,173	527,377
General Rubber Co.............	74,279	7,476	70,456	68,387	220,598	15,357	1,213	3,362	......	19,932	240,530
Berringer & Co................	75,285	8,116	74,423	29,692	187,516	......	......	......	......	......	187,516
Stowell & Co..................	28,159	6,706	52,192	13,131	100,188	38,044	......	1,334	......	39,378	139,566
Suarez, Filho & Co............	5,336	185	25,293	27,270	58,084	81,202	......	......	......	81,202	139,286
J. Marques	16,268	16,506	33,609	33,111	99,494	......	......	......	......	......	99,494
Adelbert H. Alden, Limited......	......	6,300	7,437	1,818	15,555	68,298	......	......	......	68,298	83,853
Bitar Irmãos	......	......	......	42,720	42,720	24,140	5,610	1,120	......	30,870	73,590
Ferreira, Costa & Co..........	6,290	400	13,240	......	19,930	10,000	......	......	......	10,000	29,930
Sundries	3,615	......	5,935	25,470	35,020	34,292	724	480	......	35,496	70,516
	396,536	50,789	359,885	294,099	1,101,309	425,753	29,546	12,299	22,751	490,349	1,591,658
From Manáos	251,243	45,000	151,723	232,276	680,242	236,286	9,295	16,991	1,019	263,591	943,833
From Iquitos	185,247	4,049	26,928	74,793	291,017	......	......	......	......	......	291,017
Totals	833,026	99,838	538,536	601,168	2,072,568	662,039	38,841	29,290	23,770	753,940	2,826,508

(*Compiled by Stowell & Co., Pará, Brazil.*)

EXPORTS OF INDIA RUBBER FROM MANAOS DURING THE MONTH OF MARCH, 1920

	NEW YORK.					EUROPE.					
Exporters.	Fine.	Medium.	Coarse.	Caucho.	Totals.	Fine.	Medium.	Coarse.	Caucho.	Totals.	Grand Totals.
General Rubber Co. of Brazil.*kilos*	233,860	51,320	59,911	187,689	532,780	48,983	3,517	4,000	......	56,500	589,280
Tancredo, Porto & Co............	54,056	16,143	95,422	89,642	255,263	95,914	863	6,243	......	103,020	358,283
Ohliger & Co..................	76,458	18,423	25,418	167,557	287,856	......	......	......	......	......	287,856
Stowell & Co..................	18,107	8,106	29,112	57,334	112,659	36,339	......	4,298	......	40,637	153,296
Adelbert H. Alden, Limited.......	170	256	15,321	121	15,868	89,849	3,093	235	322	93,499	109,367
Y. G. Araujo..................	......	......	......	......	33,109	......	......	......	......	......	33,109
A. Souza	1,281	177	25,723	5,928	......	14,993	1,822	2,215	697	19,727	19,727
Higson & Fall.................	13,580	1,762	460	......	15,802	......	......	......	......	......	15,802
Moraes, Carneiro & Co..........	11,446	640	373	......	12,459	......	......	......	......	......	12,459
Madeira-Mamoré Railway Co.....	......	......	......	......	......	9,500	......	......	......	9,500	9,500
G. Deffner & Co................	3,159	......	1,002	892	5,053	......	......	......	......	......	5,053
Corrêa & Irmãos................	100	......	......	......	100	......	......	......	......	......	100
	412,217	96,827	252,742	509,163	1,270,949	295,578	9,295	16,991	1,019	322,883	1,593,832
In transit, Iquitos..............	10,289	30,024	7,867	12,302	60,482	......	......	......	......	......	60,482
	422,506	126,851	260,609	521,465	1,331,431	295,578	9,295	16,991	1,019	322,883	1,654,314

(*Compiled by Stowell & Co., Pará, Brazil.*)

EXPORTS OF INDIA RUBBER FROM MANAOS DURING THE MONTH OF FEBRUARY, 1920.

	NEW YORK.					EUROPE.					
Exporters.	Fine.	Medium.	Coarse.	Caucho.	Totals.	Fine.	Medium.	Coarse.	Caucho.	Totals.	Grand Totals.
Tancredo, Porto & Co.......*kilos*	11,560	25,840	56,990	117,991	212,381	470,235	30,499	22,661	1,120	524,515	736,896
Stowell & Co..................	56,726	31,895	30,360	33,635	152,616	26,010	4,320	6,482	....	36,812	189,428
Ohliger & Co..................	64,217	2,030	8,297	48,855	123,399	46,762	....	....	....	46,762	170,161
General Rubber Co. of Brazil....	43,880	13,260	15,700	....	72,840	77,450	14,470	5,000	....	96,920	169,760
J. A. Mendes & Co..............	......	6,602	11,595	23,403	41,600	71,075	98	....	....	71,173	112 773
Adelbert H. Alden, Ltd..........	......	....	1,590	12,319	13,909	62,149	3,665	886	257	66,957	80,866
A. Souza	589	5	43,431	21,392	65,417	....	....	....	....	....	65,417
Higson & Fall..................	......	....	....	....	....	28,248	3,588	975	....	32,811	32,811
Amorim Irmãos	4,160	4,160	2,620	....	10,940	20,000	....	....	....	20,000	30,940
B. Lévy & Co..................	......	....	....	....	....	18,812	2,119	1,305	....	22,236	22,236
Moraes Carneiro & Co...........	7,360	320	690	....	8,370	4,942	960	710	39	6,651	15,021
Essabá & Lévy..................	......	....	....	....	....	13,100	533	302	....	13,935	13,935
G. Deffner & Co................	6,174	....	1,243	2,264	9,681	....	....	....	....	....	9,681
Paulo Lévy & Co................	......	....	....	....	....	3,220	320	415	....	3,955	3,955
Vianna, Lyra & Co..............	960	....	....	....	960	....	....	....	....	....	960
Totals	195,626	84,112	172,516	259,859	712,113	842,003	60,572	38,736	1,416	942,727	1,654,840
In transit from Iquitos.........	56,379	132,917	26,928	74,793	291,017	2,383	280	631	2,257	5,551	296,568
Totals	252,005	217,029	199,444	334,652	1,003,130	844,386	60,852	39,367	3,673	948,278	1,951,408

(*Compiled by Stowell & Co., Manáos, Brazil.*)

STATISTICS OF CRUDE AND MANUFACTURED RUBBER AT THE PORT OF NEW YORK.

JANUARY, FEBRUARY, AND MARCH—1919 AND 1920.

IMPORTS.

UNMANUFACTURED—*free*: Crude rubber—From:	January. 1919. Pounds.	January. 1919. Value.	January. 1920. Pounds.	January. 1920. Value.	February. 1919. Pounds.	February. 1919. Value.	February. 1920. Pounds.	February. 1920. Value.	March. 1919. Pounds.	March. 1919. Value.	March. 1920. Pounds.	March. 1920. Value.
Belgium	....	....	298,903	$90,518	....	....	340,926	$96,699	....	....	229,812	$105,003
France	....	....	490,968	198,476	....	....	827,307	243,229	181,784	$50,403	681,507	216,758
Italy	....	....	....	....	....	....	....	....	....	....	600,396	302,226
Netherlands	....	....	1,522,588	722,320	....	....	2,586,622	1,123,583	....	....	508,979	234,584
Portugal	....	....	67,461	33,730	....	....	220,462	44,000	....	....	590,983	153,832
England	11,200	$4,480	16,575,904	7,762,677	1,093,777	$424,470	15,383,717	7,312,311	7,423,948	3,656,529	11,807,228	5,261,580
British Honduras.	....	....	....	....	454	113	....	....	....	....	....	....
Canada	4,402	1,453	....	....	319,009	160,056	....	....	1,069,318	537,484	....	....
Costa Rica	13,340	3,860	623	551	5,827	2,465	....	....	418	65	....	....
Guatemala	1,888	402	942	235	....	....	2,518	503	3,967	824	....	....
Honduras	....	....	446	182	5,727	1,916	910	265	1,203	353	....	....
Nicaragua	13,659	4.009	12,996	3,578	22,026	7,771	2.750	1,173	45,310	14,772	22,929	6,103
Panama	....	....	4,200	1,453	1,594	248	1.084	395	7,184	2,837	4,581	891
Salvador	....	....	2,775	1,422	....	....	....	....	....	....	540	135
Mexico	215,774	56,307	43,441	11,167	67,408	20,222	37,007	11,106	....	....	50,918	20,731
Trinidad	....	....	9,628	4,836	580	195	4,245	3,203	1,504	302	....	....
Haiti	....	....	794	272	....	....	....	....	....	....	....	....
Bolivia	....	....	1,843	449	....	....	20,397	7,910	....	....	25,328	9,511
Brazil	5,354,280	1,892,068	4,233,199	1,405,944	5,937,411	1,870,353	3,807,367	1,177,767	6,439,808	2,046,296	5,195,613	1,586,260
Colombia	25,551	7,467	117,609	45,286	125,256	49,912	88,071	28,162	24,516	10,169	28,249	9,261
Ecuador	7,496	1,983	151,002	37,849	72,673	25,068	287,998	59,122	166.218	53,224	48,485	11,979
British Guiana	7,147	5,718	4,078	1,956	....	....	5,973	5,449	....	....	5,205	3,449
Peru	....	....	176,721	65,118	1,171,859	391,455	1,722,297	557,203	1,666,827	556,936	....	....
Uruguay	....	....	....	....	....	....	23,586	9,800	....	....	....	....
Venezuela	3,487	6,789	724	229	7,523	1,766	93,460	35,369	15.136	5,229	5,514	2,002
British India	....	....	282,195	110,812	....	....	301,293	139,066	....	....	215,615	91,362
Straits Settlements	2.026,297	685,743	17,757,741	7,440,299	2,619,426	704,328	21,732,218	9,393,584	7.069,282	2,452,702	34,750,472	16,908,820
British East Indies	740,858	294.569	7,781,126	3,127,447	3,063,747	1,362,438	7,128,151	2,921,947	4,379,157	1,760,734	4,356,545	1,811,948
Dutch East Indies	2,758,101	892,013	5,592,603	2,445,439	1,687,027	513,955	2,007,125	671,077	665,745	228,221	10,279,607	4,386,862
Hongkong	....	....	....	....	....	....	....	....	....	....	112,374	48,236
Japan	324,975	84,120	175,512	86,564	....	....	....	....	....	....	452,795	225,429
Philippines	12,251	5,800	....	....	15,065	7,533	61,618	23,764	37,637	17,650	....	....
British W. Africa	71.122	14,457	107,663	53,831	78,400	19,600	....	....	....	....	....	....
French Africa	....	....	....	....	77,620	23,287	....	....	....	....	....	....
Totals	11,591,828	$3,961,238	55,413,685	$23,652,640	16,372,409	$5,587,151	56,687,102	$23,866.687	29,198,962	$11,394,730	69,973,675	$31,596,962
Jelutong	....	....	1,211,332	171,775	....	....	1,292,316	156,414	749,904	159,187	1,052,426	164,260
Gutta percha	414,547	32,978	816,999	133,742	....	....	252,215	52,629	711.727	107,826	533,955	96,585
Balata	56,132	28,333	494,561	292,266	87,500	47.355	328,295	184,289	39.804	24,344	61,035	32,289
Rubber scrap and reclaimed	165,902	9,639	610,858	53,210	200,406	9,468	673,220	57,508	157,978	9,992	991,603	68.097
Total unmanufactured	12,228,409	$4,032,188	58,547,435	$24,303,633	16,660,315	$5,643,974	59,233,158	$24,317,527	30,858,375	$11,696,079	72,612,694	$31,958,193
Chicle ...*dutiable*	1,101.223	558,168	474,224	603,306	....	....	453,054	353,013	523.437	328,466	649,546	509,087
Rubber substitutes	....	....	....	....	269	29	11,200	2,017	....	....	....	....
Manufactures of india rubber and gutta percha—*dutiable*	....	$23,229	....	$55,650	....	$31,446	....	$27,949	....	$43,123	....	$71,338

EXPORTS.

MANUFACTURED:	January. 1919. Pounds.	January. 1919. Value.	January. 1920. Pounds.	January. 1920. Value.	February. 1919. Pounds.	February. 1919. Value.	February. 1920. Pounds.	February. 1920. Value.	March. 1919. Pounds.	March. 1919. Value.	March. 1920. Pounds.	March. 1920. Value.
Automobile tires.	....	$1,202,668	....	$2,573,773	....	$1,334,304	....	$3,199,706	....	$1,256,011	....	$3,624,172
Inner tubes	....	....	....	40,145	....	....	....	142,146	....	....	....	480,309
Solid tires	....	....	....	26,920	....	....	....	141,519	....	....	....	414,413
All other tires	....	71,506	....	117,466	....	43,197	....	52,731	....	86,980	....	70,490
Belting	....	374,461	....	119,441	....	316,067	....	109,893	....	....	....	195,944
Hose	....	....	....	41,567	....	....	....	202,368	....	....	....	76,949
Packing	....	....	....	17,890	....	....	....	68,962	....	....	....	96,777
Rubber boots	4,606	17,648	21,842	88,189	3,297	9,544	24,658	97,200	2,906	12,603	14,140	36,973
Rubber shoes	59,231	47,428	951,777	1,000,552	88,795	72,663	743,205	887,062	441,451	278,896	824,632	741,126
Soles and heels	....	....	....	13,787	....	....	....	47,222	....	....	....	60,155
Druggists' sundries	....	42,653	....	60,606	....	48,193	....	90,766	....	64,710	....	131,905
Other manufactures of rubber	....	375,174	....	432,653	....	619.051	....	378,918	....	412,233	....	468,051
Totals, manufactured	....	$2,131,538	....	$4,532,989	....	$2,443,019	....	$5,418,493	....	$2,111,433	....	$6,396,264
Insulated wire	....	545,921	....	619,109	....	595,688	....	500,687	....	957,628	....	507,189
Fountain pens	11,217	8,625	32,929	34,440	27,935	27,652	17,358	13,895	15,995	20,183	19,147	24,144
Suspenders and garters	....	180,375	....	170,591	....	126,594	....	236,503	....	244,216	....	280,491
Chewing gum	....	197,537	....	257,582	....	86,496	....	277,561	....	99,057	....	320,918
UNMANUFACTURED: Reclaimed and scrap rubber	196,227	$10,497	361,108	$48,855	456,722	$63,471	285,365	$37,200	172,688	$30,898	403,990	$45,508

EXPORTS OF FOREIGN MERCHANDISE.

UNMANUFACTURED:	January. 1919. Pounds.	January. 1919. Value.	January. 1920. Pounds.	January. 1920. Value.	February. 1919. Pounds.	February. 1919. Value.	February. 1920. Pounds.	February. 1920. Value.	March. 1919. Pounds.	March. 1919. Value.	March. 1920. Pounds.	March. 1920. Value.
India rubber	....	....	64,960	$25,303	58,676	$37,534	....	....	....	....	94,040	$45,605
Balata	50,300	30,884	54,958	32.698	32,000	19,585	34,000	19,135	....	....	83,390	46.976
Gutta percha	500	2,250	....	....	10,205	2,179	....	....	....	....	....	....
Totals	50,800	$33,134	119,918	$58,001	100,881	$59,298	34,000	$19,135	....	....	177,430	$92,581
Rubber substitutes	....	....	....	....	....	....	14,504	10,553	....	....	17	9
India rubber manufactures	....	....	....	....	....	....	....	1,034	....	....	....	1,398

EXPORTS OF INDIA RUBBER MANUFACTURERS AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES, DURING THE MONTH OF MARCH, 1920.

EXPORTED TO	Belting. Value.	Hose. Value.	Packing. Value.	Boots. Pairs.	Boots. Value.	Shoes. Pairs.	Shoes. Value.	Soles and Heels. Value.	Automobile Tires. Casings. Value.	Automobile Tires. Inner Tubes. Value.	Automobile Tires. Solid Tires. Value.	Automobile Tires. All Others. Value.	Insulated Wire and Cables. Value.	Druggists' Rubber Sundries. Value.	All Other Manufactures of Rubber. Value.	Totals Value.
EUROPE:																
Austria									$19,943						$1,601	$21,54[illegible]
Azores and Madeira Is.															23	[illegible]
Belgium			$549			5,012	$3,642		146,395	$3,433	$31,001		$7,411	$76	12,850	205,35[illegible]
Bulgaria						36	49								3	[illegible]
Denmark	$17	$402		4,706	$8,016	22,564	20,709		50,562	13,545	34,451	$1,154	2,699	5,011	13,396	149,9[illegible]
Finland	10,776	2,115	507			115,015	97,992		19,998	2,400	9,680	20	121		2,005	145,61[illegible]
France	2,108	77	1,256			34,932	25,989	$3,950	590,748	44,290	12,150	11,027	5,161	3,992	75,393	776,141
Germany									108,123	607	11,143	10		250	6,990	127,1[illegible]
Greece	1,197	310		36	198	250	238	146	36,995	6,909	3,409	186	3,417	360	1,267	54,6[illegible]
Iceland and Faroe Is.				5,779	17,369	3,022	3,053		2,046	44					3,901	26,41[illegible]
Italy	2,635	197	771	27	144	31,898	30,738		87,979	7,079			15,[illegible]83	15,822	4,776	165,4[illegible]
Malta, Gozo and Cyprus Is.										179	300					4[illegible]
Netherlands	3,115	200	249			20,148	19,458		214,903	10,817	13,790	7,091	20,492	3,314	15,480	308,9[illegible]
Norway		5,939	109	138	543	162,963	126,528	800	90,908	7,254	45,610		48,536	81	8,563	335,1[illegible]
Poland and Danzig	70					60,347	47,984		16,872						41	64,9[illegible]
Portugal	803								61,518	6,481	10	2,100	3,56[illegible]		1,911	76,3[illegible]
Roumania	798	1,463	599			4,505	8,533		100,683	16,434			14,903		13	143,4[illegible]
Russia in Europe						1,772	2,015		1,148	168						3,3[illegible]
Spain	200	904				18,416	18,792	180	128,413	11,146	15,794	2,587	6,[illegible]27	1,069	6,972	192,8[illegible]
Sweden	12,311	9,069	911	379	886	43,558	34,237		239,590	24,499	37,090	3,009	15,005	4,9[illegible]4	11,688	393,[illegible]1
Switzerland	378					6,720	5,094		55,152	328			936	3,780	2,141	67,8[illegible]
Turkey in Europe	16			326	1,046	3,884	3,794	1,800	5,589	1,999			659		2,008	16,9[illegible]
England	980	25,999	8,986	11,018	32,052	420,588	300,136	4,617	483,775	124,988	10,073	4,126	29,240	21,443	142,089	1,188,5[illegible]
Scotland	225					14,346	11,914		31,105	2,358	83	211		80	2,636	48,61[illegible]
Ireland								2,232	629			7			7	2,8[illegible]
Jugoslavia, Albania and Fiume				36	120											1[illegible]
TOTALS, EUROPE	$35,629	$46,675	$13,937	22,445	$60,374	969,976	$760,895	$13,725	$2,493,074	$284,958	$224,584	$31,528	$173,953	$60,802	$315,754	$4,515,8[illegible]
NORTH AMERICA:																
Bermuda		$148	$423	46	$152	156	$169	$279			$340	$100	$1,609	$53	$169	$3,41[illegible]
British Honduras		16				2,235	4,376		$238	$43			230	10	160	5,07[illegible]
Canada	$41,662	8,209	13,003	6,091	21,054	8,335	7,617	1,921	179,656	48,515	35,749	94,113	14,680	35,320	188,852	690,351
Costa Rica	32	1,017	433					1,154	1,868	55	244		480	487	924	6,69[illegible]
Guatemala	1,469	150	310					1,278	4,269	1,142		1,050	587	284	1,989	12,52[illegible]
Honduras	500	2,365	471			218	215	218	3,005	891			518	93	947	9,223
Nicaragua	596	601	786					2,146	1,191	323		436	1,096	577	232	7,984
Panama		2,993	2,066	24	94	2,202	1,870	2,554	22,026	2,538	13,831	1,352	14,060	663	2,798	66,84[illegible]
Salvador	429	178	333					9,538	8,761	633			1,439	949	997	23,25[illegible]
Mexico	13,772	35,174	21,507	34	222	8,806	11,105	4,457	73,635	16,928	5,234	1,202	41,277	7,335	22,852	254,70[illegible]
Miquelon, Langley, etc.				1,536	5,618											5,618
Newfoundland and Labrador	3,351	1,402	74	3,468	12,697	864	1,207	355	812	157	214		1,520	84	1,015	22,88[illegible]
Barbados		172						19	3,160	311		151		15	122	3,950
Jamaica	140	1,875				6,932	9,256	1,201	25,174	2,020	893	1,127	496	458	1,329	43,969
Trinidad and Tobago		478	64					127	15,235	2,134		1,306	297	444	872	20,957
Other British West Indies		59	3			60	165	56	1,392	266	369	466	2	37	381	3,196
Cuba	3,765	11,258	3,884	65	414	5,938	6,047	10,893	120,227	5,333	19,430	1,828	34,367	8,389	12,110	237,945
Virgin Islands of the U. S.		7				38	29	270	158	44		476		1	14	999
Dutch West Indies			61						2,956	765				52	366	4,201
French West Indies	230	11						44	1,901	774	1,080	146	83		521	4,790
Haiti	53	74	70			24	37	72	2,701	192	80	150	579	106	687	4,801
Dominican Republic	774	352	876			220	186	658	28,977	5,247	1,645	1,195	825	1,116	3,942	45,79[illegible]
TOTAL, NORTH AMERICA	$66,773	$66,539	$44,364	11,264	$40,251	36,028	$42,279	$37,240	$497,342	$88,311	$79,019	$105,098	$114,145	$56,473	$241,279	$1,479,20[illegible]
SOUTH AMERICA:																
Argentina	$1,752	$15,372	$5,019	1,304	$2,534	170	$154	$3,508	$188,783	$38,218	$721	$577	$33,082	$5,599	$27,762	$323,081
Bolivia	1,364	62	120						407				526	550	255	3,28[illegible]
Brazil	10,012	21,822	1,792	6	45	25,220	24,686	3,567	118,660	16,561	4,217	38	71,498	6,462	20,047	299,40[illegible]
Chile	35,925	7,559	2,827			6,561	7,903		67,668	8,853	997	3,526	8,515	984	5,033	149,790
Colombia	237	967	978			91	81	1,531	10,993	3,178	413	744	9,893	8,146	3,002	40,16[illegible]
Ecuador		232				48	61		1,992	495	602		697	302	731	5,112
British Guiana	8,472	80	104			48	35		4,871	1,106	250		923		629	16,470
Dutch Guiana								181	425	50			3		145	804
French Guiana								150								15[illegible]
Paraguay	2,703		370						73				202			3,348
Peru	855	3,713	3,522					106	19,357	1,041	1,072	364	5,566	1,108	3,205	39,70[illegible]
Uruguay	215	3,000	2,138			2,016	1,622	1,062	59,142	6,897	2,807		15,584	1,429	5,637	99,533
Venezuela	185	785	442			182	158	799	24,568	2,784	136	342	5,483	4,538	9,561	49,781
TOTALS, SOUTH AMERICA	$61,720	$53,592	$17,112	1,320	$2,579	34,336	$34,700	$10,904	$496,939	$79,183	$11,215	$5,591	$151,972	$29,118	76,007	$1,030,63[illegible]
OCEANIA:																
Australia	$14,594	$10,690	$1,977			2,688	$2,176	$851	$8[illegible],093	$3,526	$7,506	$1,688	$1,447	$5,344	$9,114	$141,006
New Zealand	5,072	114	105	420	$2,775	12,11[illegible]	17,600	1,348	110,546	14,493	5,700	11,966	3,777	4,001	11,303	188,800
Other Brit. Oceania																
French Oceania																
Other Oceania						132	147		261	18	402		87			915
Philippine Islands	9,345	6,876	6,255	60	151	5,268	6,159	4,084	43,454	13,098	14,055	2,362	32,003	5,088	15,703	158,633
Abyssinia															81	81
TOTALS, OCEANIA	$29,011	$17,680	$8,337	480	$2,926	19,600	$26,082	$6,283	$236,354	$31,135	$27,663	$16,016	$37,314	$14,433	$36,201	$489,43[illegible]

EXPORTED TO	Belting, Value.	Hose, Value.	Packing, Value.	Boots. Pairs.	Boots. Value.	Shoes. Pairs.	Shoes. Value.	Soles and Heels. Value.	Automobile Tires. Casings. Value.	Inner Tubes. Value.	Solid Tires. Value.	All Others. Value.	Insulated Wire and Cables. Value.	Druggists' Rubber Sundries. Value.	All Other Manufactures of Rubber. Value.	Totals Value.
China:																
China	$3,570	$1,200	......	242	$732	13,690	$8,963	$263	$54,073	$1,615	$5,095	$9,445	$38,609	$3,357	$10,617	$137,539
Chosen	......	904	......	......	......	......	......	......	2,935	......	......	......	......	182	......	4,021
British India	......	2,819	$1,705	......	......	71	50	500	110,721	32,064	35,156	8,044	5,525	3,722	6,987	207,293
Straits Settlements	......	......	......	......	......	......	......	......	14,206	1,361	......	......	122	......	803	16,492
Other British East Indies	......	600	......	......	......	......	......	......	3,134	......	......	......	111	......	487	4,332
Dutch East Indies	1,119	1,699	......	......	......	......	......	......	92,678	19,298	74,265	648	7,019	......	5,164	201,890
French East Indies	......	......	......	......	......	......	......	......	......	......	......	......	......	39	......	39
Hongkong	......	38	......	......	......	750	792	......	1,359	26	1,600	69	16	109	1,375	5,384
Japan	30,415	3,633	16,576	1,348	3,199	84,897	116,457	......	22,290	2,768	1,985	2,312	10,839	923	27,968	239,30[illegible]
Persia	......	......	......	......	......	240	238	......	......	......	......	......	......	......	......	238
Russia in Asia	......	......	......	389	1,342	......	......	......	......	......	......	......	......	......	......	1,342
Siam	......	......	......	......	......	......	......	......	864	......	......	52	......	......	130	1,046
Turkey in Asia	......	......	......	......	......	5,460	5,108	11	1,887	......	......	346	......	6,460	411	14,223
Totals, China	$35,104	$10,893	$18,281	1,979	$5,273	105,048	$131,608	$774	$304,147	$57,132	$118,101	$30,916	$62,241	$14,792	$53,942	$833,204
Africa:																
Belgian Kongo	......	$105	......	......	......	2	$2	......	$388	......	......	......	......	......	......	$495
British West Africa	......	75	......	......	......	......	......	......	50,792	$6,264	$270	......	......	......	[illegible]	57,4[illegible]
British South Africa	$49,215	37,049	$25,763	9	$35	10,968	13,652	$1,632	117,577	17,003	2,012	$971	$3,2[illegible]	$2,6[illegible]	5,1[illegible]	275,9[illegible]
British East Africa	......	......	47	......	......	......	......	......	2,292	......	......	......	......	......	......	2,339
Canary Islands	......	......	......	......	......	......	......	......	871	......	1,500	......	......	......	......	2,371
French Africa	......	......	643	......	......	......	......	......	1,720	182	......	......	......	......	17	2,562
Liberia	......	......	......	......	......	......	......	......	......	......	......	......	669	......	......	669
Portuguese Africa	......	550	456	......	......	......	......	......	......	......	......	85	......	20	348	1,459
Egypt	124	2,674	......	......	......	......	......	1,339	19,460	1,410	14,694	896	......	162	962	41,721
Totals, Africa	$49,339	$40,453	$26,909	9	$35	10,970	$13,654	$2,971	$193,100	$24,859	$18,476	$1,952	$3,921	$2,784	$6,583	$385,036
Grand Totals	$277,576	$235,832	$128,940	37,487	$111,438	1,175,958	$1,009,218	$71,897	$4,220,956	$565,578	$479,148	$181,101	$543,546	$178,402	$729,766	$8,733,398

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORY OF THE UNITED STATES.

	Belting, Hose, and Packing.	Boots and Shoes. Pairs.	Boots and Shoes. Value.	Tires. Automobile. Value.	Tires. All Others. Value.	Insulated Wire and Cables. Value.	Druggists' Rubber Sundries. Value.	All Other Manufactures of Rubber. Value.	Totals. Value.
Hawaii	$24,385	......	......	$123,133	$22,986	......	......	$20,512	$191,016
Porto Rico	3,626	......	......	41,484	7,716	......	......	8,641	61,467
Totals	$28,011	......	......	$164,617	$30,702	......	......	$29,153	$252,483

(Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.)

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	March. 1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
Unmanufactured—*free:*				
India rubber:				
From France	181,784	$50,463	681,507	$216,758
Netherlands	......	......	508,979	234,584
Portugal	......	......	590,983	153,832
United Kingdom	8,543,628	4,059,734	12,132,921	5,430,923
Canada	3,303,663	1,586,119	10	[illegible]
Central America	68,729	22,016	33,633	8,690
Mexico	106,319	47,788	50,918	20,731
Brazil	6,439,[illegible]	2,046,296	5,195,613	1,586,260
Peru	1,066,827	556,936	......	......
Other South America	218,590	[illegible]	112,781	36,202
British E. Indies	41,483,959	15,991,931	50,543,518	24,079,584
Dutch E. Indies	2,534,091	[illegible]	11,230,835	4,934,512
Other countries	[illegible]	42,935	1,395,909	681,081
Totals	64,653,687	$25,584,915	82,477,607	$37,383,161
Balata	39,804	[illegible]	[illegible]	[illegible]
Guayule	420,927	107,877	256,300	59,820
Jelutong (Pontianak)	1,678,754	250,871	1,053,230	164,519
Gutta percha	1,009,209	156,902	630,394	106,495
Rubber scrap	[illegible]	21,234	1,554,686	104,357
Totals, unmanufactured	68,180,590	$26,146,143	86,033,[illegible]	$37,[illegible]
Chicle (dutiable)	849,307	$563,200	1,1[illegible]	$863,822
India rubber and gutta percha	......	77,362	......	107,543
India rubber substitute	7,850	1,274	......	...

EXPORTS OF DOMESTIC MERCHANDISE.

Manufactured—				
India rubber:				
Scrap and old	261,495	$26,649	1,418,[illegible]	$89,108
Reclaimed	279,933	46,136	608,[illegible]	[illegible]
Belting[1]	......	[illegible]	......	277,576
Hose[1]	......		......	235,852
Packing[1]	......		......	128,940
Boots[1] ... pairs	18,048	56,836	37,487	111,438
Shoes ... pairs	500,948	377,621	1,175,958	1,009,218
Soles and heels[1]	......	......	......	71,897
Tires:				
For automobiles[1]	......	1,891,220	......	...
Casings[1]	......		......	4,220,956
Inner tubes[1]	......		......	565,578
Solid tires[1]	......		......	479,578
All other tires[1]	......	112,441	......	181,101
Druggists' rubber sundries[1]	......	99,646	......	178,402
Suspenders and garters	......	278,271	......	323,881
Other rubber manufactures[1]	......	681,909	......	729,766
Totals, manufactured	......	$4,145,578	......	$8,761,570
Fountain pens....*number*	17,519	$21,591	[illegible]6,431	$31,346
Chewing gum	......	141,180	......	357,783
Insulated wire and cables[1]	......	1,025,867	......	543,546

EXPORTS OF FOREIGN MERCHANDISE.

Unmanufactured—				
India rubber	450,067	$192,991	554,505	$231,013
Balata	28,000	18,417	83,390	46,976
Jelutong (Pontianak)	......	......	[illegible]	5,562
Rubber scrap	......	......	49,693	9,690
Totals, unmanufactured	......	$211,408	......	$293,241
Manufactured—				
Gutta percha	......	$234	......	$1,527
Totals manufactured	......	$234	......	$1,527
India rubber substitute	......	......	3,059	$1,407
Chicle	10	12	41,498	21,299

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

Manufactured—				
To Alaska:				
Belting, hose and packing	......	$9,319	......	$12,542
Boots and shoes ... pairs	9,400	29,606	8,05[illegible]	30,813
Other rubber goods	......	5,693	......	4,266
Totals	9,400	$44,618	8,05[illegible]	$47,621
To Hawaii:				
Belting, hose and packing	......	$17,741	......	[illegible]
Automobile tires	......	149,812	......	123,133
Other tires	......	7,429	......	22,986
Other rubber goods	......	11,728	......	20,512
Totals	......	$186,710	......	[illegible]
To Porto Rico:				
Belting, hose, and packing	......	[illegible]	......	[illegible]
Automobile tires	......	[illegible]	......	[illegible]
Other tires	......	[illegible]	......	[illegible]
Other rubber goods	......	[illegible]	......	[illegible]
Totals	......	$141,[illegible]	......	[illegible]

[illegible] Islands treated as foreign countries.

[1] Details of exports of domestic merchandise [illegible] are given on pages [illegible] of this issue.

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	February.			
	1919.		1920.	
UNMANUFACTURED—*free*:	Pounds	Value.	Pounds.	Value.
India rubber:				
From France	......	......	827,307	$243,229
Netherlands	......	......	2,586,622	1,123,583
Portugal	......	......	220,462	44,000
United Kingdom	1,093,777	$424,470	15,639,792	7,431,553
Canada	899,995	456,638	9,820	4,630
Central America.	37,245	12,950	7,312	2,336
Mexico	222,086	57,766	125,716	50,065
Brazil	5,937,411	1,870,353	3,807,367	1,177,767
Peru	1,171,859	391,455	1,722,297	557,203
Other South America	205,452	76,746	519,485	155,812
British E. Indies.	19,560,732	7,224,396	42,982,996	18,823,383
Dutch E. Indies.	3,761,983	1,295,391	2,429,197	874,662
Other countries.	615,677	249,189	476,531	158,312
Totals	33,506,217	$12,059,354	71,354,904	$30,646,535
Balata	366,859	114,870	328,325	184,304
Guayule	221,648	52,620	40,020	12,006
Jelutong (Pontianak)	398,774	31,626	1,292,316	156,414
Gutta percha	......	......	252,215	52,629
Rubber scrap	379,396	22,438	1,327,957	92,215
Totals	1,366,677	$221,554	3,240,833	$497,568
Totals, unmanufactured	34,872,894	12,280,908	74,595,737	31,144,103
Chicle (dutiable)	1,684,612	1,120,336	744,925	596,143
MANUFACTURED—*dutiable*:				
India rubber and gutta percha	......	$49,275	......	$58,070
India rubber substitutes.	269	29	51,200	8,842

EXPORTS OF DOMESTIC MERCHANDISE.

	1919 Pounds	1919 Value	1920 Pounds	1920 Value
MANUFACTURED—				
India rubber:				
Scrap and old	358,185	$32,765	1,446,414	$100,129
Reclaimed	594,749	88,133	409,642	67,451
Belting[1]	......	455,136 (Belting, Hose, Packing)	......	170,299
Hose[1]	......		......	272,348
Packing[1]	......		......	105,047
Boots[1]	12,138	36,710	39,933	139,224
Shoes[1]	190,961	156,142	1,019,959	866,483
Soles and heels[1]	......	......	......	64,848
Tires:				
For automobiles[1]	......	1,941,012 (Tires for automobiles, Casings, Inner tubes, Solid tires)	......	......
Casings[1]	......		......	3,849,706
Inner tubes[1]	......		......	214,311
Solid tires[1]	......		......	213,952
All other tires[1]	......	65,209	......	58,067
Druggists' rubber sundries[1]	......	84,206	......	121,400
Suspenders and garters	......	165,320	......	283,267
Other rubber manufactures[1]	......	876,831	......	610,247
Totals, manufactured	1,156,033	$3,901,464	2,915,948	$7,136,779
Fountain pens....*number*	32,508	31,647	20,458	17,022
Chewing gum	......	129,901	......	......
Insulated wire and cables[1]	......	710,830	......	567,036

EXPORTS OF FOREIGN MERCHANDISE.

	1919 Pounds	1919 Value	1920 Pounds	1920 Value
UNMANUFACTURED—				
India rubber	303,659	$147,457	144,575	$60,270
Balata	32,000	19,585	86,830	32,999
Gutta percha	10,205	2,179	120	330
Jelutong (Pontianak)	422	80	60,454	13,015
Rubber scrap	......	......	3,099	300
Totals, unmanufactured	346,286	$169,301	295,078	$106,914
MANUFACTURED—				
Gutta percha	......	$14	......	1,034
Totals, manufactured	......	$14	......	$1,034
India rubber substitutes.	......	......	14,590	10,588
Chicle	62,719	35,867	......	......

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORY OF THE UNITED STATES.

	1919 Quantity	1919 Value	1920 Quantity	1920 Value
MANUFACTURED—				
To Alaska:				
Belting, hose and packing	......	$9,854	......	$5,461
Boots and shoes..*pairs*	3,066	5,004	3,154	9,611
Other rubber goods	......	628	......	5,345
Totals	3,066	$15,486	3,154	$20,417
To Hawaii:				
Belting, hose and packing	......	8,826	......	7,031
Automobile tires	......	91,789	......	44,259
Other tires	......	731	......	502
Other rubber goods	......	10,615	......	4,902
Totals	......	$111,961	......	$56,694
To Porto Rico:				
Belting, hose and packing	......	$2,799	......	$9,080
Automobile tires	......	66,567	......	47,318
Other tires	......	1,124	......	7,539
Other rubber goods	......	8,169	......	21,388
Totals	......	$78,659	......	$85,325

To Philippine Islands—treated as foreign commerce.

[1]Details of exports of domestic merchandise by countries during February were given on pages 548-549 of THE INDIA RUBBER WORLD, May 1, 1920.

RUBBER STATISTICS FOR THE DOMINION OF CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	February.			
	1919.		1920.	
UNMANUFACTURED—*free*:	Pounds.	Value.	Pounds.	Value.
Rubber, gutta percha, etc.:				
From United Kingdom.	2,219	$1,168	1,536,109	$897,511
United States	207,705	81,646	616,546	324,054
Brazil	81,646	116,480	......	......
British East Indies:				
Ceylon	164,187	88,978	224,000	123,703
Straits Settlements	997,881	363,643	1,041,692	484,290
Dutch East Indies	69,703	14,851	114	57
Other countries	30,232	9,824	72,297	31,003
Totals	1,553,573	$676,590	3,490,758	$1,860,618
Rubber, recovered	181,281	35,134	422,442	75,010
Rubber scrap	467,989	48,254	67,511	5,634
Balata	7	10	......	......
Totals unmanufactured	2,202,850	$759,988	3,980,711	$1,941,262
PARTLY MANUFACTURED:				
Hard rubber sheets and rods	2,109	$1,911	5,419	$3,307
Hard rubber tubes	......	2,480	......	1,845
Rubber thread, not covered	2,334	3,474	5,382	7,950
Totals partly manufactured	4,443	$7,865	10,801	$13,102
MANUFACTURED—				
Belting	......	$9,382	......	$12,633
Hose	......	11,052	......	7,718
Packing	......	6,704	......	6,496
Boots and shoes	......	13,098	......	31,992
Clothing, including waterproofed	......	23,965	......	30,977
Gloves	......	......	......	754
Hot water bottles	......	*	......	495
Mats and matting	......	2,184	......	281
Tires, solid	......	53,998 (Tires, solid, pneumatic, inner tubes, other kinds)	......	7,237
Tires, pneumatic	......		......	412,765
Tires, inner tubes	......		......	40,050
Tires, other kinds	......		......	......
Other manufactures	......	160,535	......	197,816
Totals, manufactured.	......	$280,918	......	$749,214
Totals, rubber imports	......	$1,048,671	......	$2,703,578
Insulated wire and cables:				
Wire and cables, covered with cotton, linen, silk, rubber, etc.	......	$14,968	......	$10,761
Copper wire and cables, covered as above	†	......	......	18,469
Rubber substitutes	$185,404	18,946	$158,505	20,021
Chicle	41,841	28,299	137,455	114,918

*Included with "Manufactures of india rubber," etc.
†Included in "Wire and Cables."

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	February.			
	1919.		1920.	
UNMANUFACTURED.	Produce of Canada. Value.	Reexports of Foreign Goods. Value.	Produce of Canada. Value.	Reexports of Foreign Goods. Value.
Crude and waste rubber.	$41,319	......	$41,184	$25
MANUFACTURED:				
Belting	$765	......	$1,354	......
Hose	8,216	......	12,993	......
Boots and shoes	115,874	$274	93,079	126
Clothing, including waterproofed	1,842	......	616	9
Tires, pneumatic	634,284 (Tires, pneumatic and other kinds)	4,379	822,316	3,354 (Tires, pneumatic and other kinds)
Tires, other kinds			626	
Other manufactures	68,108	333,480	17,238	1,850
Totals, manufactured.	$829,089	$338,133	$948,408	$5,339
Totals, rubber exports.	$870,408	$338,133	$989,406	$5,364
Insulated wire and cable.	......	......	438	......
Chicle	71,450	......	33,934	......

RUBBER STATISTICS FOR ITALY.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

Eleven Months Ended November 30, 1919.

	1918 Quintals.[1]	1918 Lire.[2]	1919 Quintals.	1919 Lire.
UNMANUFACTURED—				
Crude rubber and gutta percha—raw and reclaimed				
From Great Britain	7,155		132	
British India and Ceylon	7,011		24,652	
Straits Settlements	28,652		43,996	
French African Colonies	6,496	65,757,650	3,977	107,752,050
Belgian Congo	251		1,033	
Brazil	17,419		27,344	
Other countries	2,306		1,576	
Totals	69,293	65,757,650	102,710	107,752,050
Fubber scrap	2,379	428,220	14,700	2,646,000
Totals, unmanufactured	71,672	66,185,870	117,410	110,398,050
MANUFACTURED—				
India rubber and gutta percha				
Threads	599	1,577,400	207	538,200
Sheets, including hard rubber	300	481,800	121	201,400
Tubes	111	63,700	218	293,600
Belting	512	716,800	561	785,400
Rubber-coated fabrics—*pieces*.	250	385,600	435	539,200
Boots and shoes.........*pairs*	31,510	472,650	52,235	783,525
Elastic webbing	194	543,200	292	550,000
Clothing and articles for travel	15	48,000	9	28,800
Tires and tubes:				
From France	2,408		3,987	
Great Britain	446	6,852,150	1,214	12,892,800
Other countries	1		171	
Other manufactures	6,993	10,816,300	13,894	21,685,700
Totals, manufactured...	.....	21,957,600	...	38,298,625
Total imports	.....	88,143,470	..	148,696,675

EXPORTS OF CRUDE AND MANUFACTURED RUBBER.

	1918 Quintals.	1918 Lire.	1919 Quintals.	1919 Lire.
UNMANUFACTURED—				
India rubber and gutta percha—raw and reclaimed:				
To Spain	1,394		2,140	
United States	1,134	1,011,200	2,078	1,687,600
Other countries	.....		1	
Totals	2,528	1,011,200	4,219	1,687,600
Ruber scrap	....	.. ...	4,201	504,120
Totals, unmanufactured	2,528	1,011,200	8,420	2,191,720
MANUFACTURED—				
India rubber and gutta percha—				
Threads	76	205,200	480	1,296,000
Sheets, including hard rubber	88	141,600	87	158,400
Tubes	366	452,200	791	1,036,100
Belting	87	139,200	95	152,000
Rubber-coated fabrics—*pieces*.	46	55,200	255	306,000
Boots and shoes—*pairs*	.....	......	6,064	90,960
Elastic webbing	1,024	3,072,000	808	2,424,000
Clothing and articles for travel	8	38,400	42	201,600
Tires:				
To France	2,939		1,041	
Great Britain	2,001		6,254	
Spain	82		610	
Switzerland	2		1,779	
British India and Ceylon	579		944	
Dutch East Indies	607	15,086,000	344	36,107,600
Straits Settlements	235		198	
Australia	95		507	
Argentina	221		1,531	
Brazil	529		1,055	
Other countries	650		4,741	
Totals, tires	7,940	15,086,000	19,004	36,107,600
Other rubber manufactures:	1,187	1,774,800	3,958	5,753,400
Totals, manufactured	....	20,963,600	......	47,526,060
Total exports	.....	21,975,800	......	49,717,780

[1]One quintal equals 220.46 pounds.
[2]One lira equals $0.193.

RUBBER STATISTICS FOR ITALY.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

Twelve months ended December 31.

	1918. Quintals.[1]	1918. Lire.[2]	1919. Quintals.	1919. Lire.
UNMANUFACTURED—				
India rubber and gutta percha—raw and reclaimed:				
From Great Britain	7,155		132	
British India and Ceylon	7,980		25,579	
Straits Settlements	31,130		44,624	
French African Colonies	6,601	79,227,750	3,977	110,549,250
Belgian Congo	251		1,033	
Brazil	19,925		27,712	
Other countries	2,413		2,228	
Totals	75,455	79,227,750	105,285	110,549,250
Rubber scrap	2,945	530,100	15,083	2,714,940
Totals unmanufactured	78,400	79,757,850	120,368	113,264,190
MANUFACTURED—	Quintals.	Lire.	Quintals.	Lire.
India rubber and gutta percha—				
Threads	671	1,744,600	[illegible]	767,000
Sheets, including hard rubber	343	551,500	[illegible]	257,700
Tubes	112	150,600	[illegible]	308,000
Belting	607	849,800	663	844,200
Rubber-coated fabrics	393	622,700	581	837,300
Boots and shoes........*pairs*	32,443	486,645	90,393	1,358,895
Elastic webbing	332	929,600	363	1,016,400
Clothing and articles for travel	17	54,400	28	89,600
Tires:				
From France	2,554		4,314	
Great Britain	468	7,260,000	1,722	15,062,400
Other countries	3		240	
Other rubber manufactures...	7,901	12,207,800	15,388	24,001,900
Totals, manufactured	....	24,857,645	......	44,543,395
Total imports	.....	104,615,495	......	157,807,585

EXPORTS OF CRUDE AND MANUFACTURED RUBBER.

	1918. Quintals.	1918. Lire.	1919. Quintals.	1919. Lire.
UNMANUFACTURED—				
India rubber and gutta percha—raw and reclaimed:				
To Spain	1,778		2,155	
United States	1,134	1,164,800	2,605	1,904,400
Other countries	.....		1	
Totals	2,912	1,164,800	4,761	1,904,400
Rubber scrap	..	......	4,842	581,040
Totals, unmanufactured	2,912	1,164,800	9,603	2,485,440
MANUFACTURED—				
India rubber and gutta percha—				
Threads	82	221,400	503	1,358,100
Sheets, including hard rubber	92	146,700	89	161,500
Tubes	401	491,700	906	1,111,300
Belting	87	139,200	95	152,000
Rubber fabrics.......*pieces*	55	66,000	293	351,600
Boots and shoes........*pairs*	.....	......	6,364	95,460
Elastic webbing	1,205	3,615,000	1,005	3,015,000
Clothing and articles of travel	10	48,000	167	801,600
Tires:				
To France	2,947		1,160	
Great Britain	2,001		8,843	
Spain	84		696	
Switzerland	2		1,845	
British India and Ceylon	579		1,410	
Dutch East Indies	774	15,828,900	417	44,593,000
Straits Settlements	235		271	
Australia	158		508	
Argentina	221		1,532	
Brazil	529		1,057	
Other countries	801		5,731	
Other rubber manufactures..	1,239	1,853,200	4,604	6,676,000
Totals, manufactured..	.....	22,410,100	......	58,315,560
Total exports	.....	23,574,900	......	60,801,000

[1] One quintal equals 220.46 pounds.
[2] One lira equals $0.193

UNITED KINGDOM RUBBER STATISTICS.

IMPORTS.

March.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
UNMANUFACTURED—				
Crude rubber:				
From—				
Dutch East Indies	142,600	£16,040	67,400	£7,836
French West Africa	....	....	52,600	4,380
Gold Coast	27,300	3,696	47,400	5,766
Other African countries	400,700	39,240	97,500	9,721
East Africa (including Madagascar)	108,500	11,094	72,400	8,635
Peru	33,100	4,323	12,600	1,395
Brazil	2,237,200	240,898	3,492,400	418,040
British India	2,235,200	249,941	1,345,500	167,229
Straits Settlements	7,365,000	792,931	4,765,800	596,000
Federated Malay States	4,538,300	530,116	5,586,300	688,412
Ceylon and dependencies	3,479,400	386,724	3,943,200	461,460
Other Dutch possessions in Indian Seas	1,401,500	154,622	708,400	85,934
Other countries in East Indies and Pacific, not elsewhere specified	414,900	50,163	186,400	23,439
South and Central America (except Brazil and Peru)	1,400	115	11,200	1,200
Other countries	2,500	889	241,000	18,428
Totals	22,387,600	£2,480,792	20,630,100	£2,497,875
Waste and reclaimed rubber	80,400	2,140	536,900	13,174
Totals, unmanufactured	22,468,000	£2,482,932	21,167,000	£2,511,049
Gutta percha and balata	997,200	201,792	657,500	115,982
*Rubber substitute	....	....	166,200	7,210

*Included in "Other Articles," Class III., T., prior to 1920.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
MANUFACTURED—				
Boots and shoes..*dozen pairs*	3,538	£5,495	30,484	£82,076
Waterproofed clothing	....	893	......	3,156
Tires and tubes	....	88,642	......	351,724
Other rubber manufactures	....	47,214	.....	55.321
Insulated wire	....	2,472	.....	666
Submarine cables	......	.....	...	50
Totals	.....	£144,716	......	£492,993

UNITED KINGDOM RUBBER STATISTICS—(Continued)

EXPORTS.

	March 1.			
	1919.		1920.	
Unmanufactured—				
Waste and reclaimed rubber..	790,700	£20,634	1,309,900	£27,497
†Rubber substitutes	....	.. ..	504,800	32,180
Totals	......	....	1,814,700	£59,677
Manufactured—				
Waterproofed clothing	. .	£86,262	.....	£256,145
Boots and shoes . . . dozen pairs	6,187	11,631	7,661	16,685
Tires and tubes	. .	344,714	......	590,002
Other rubber manufactures...		262,547	.. .	486,516
Insulated wire	. . .	32,757	.....	130,499
Submarine cables	......	47,496	.. .	303,406
Totals	....	£802,041	....	£1,842,930

†Included in "Other Articles," Class III, T., prior to 1920.

EXPORTS—COLONIAL AND FOREIGN.

Unmanufactured—				
Crude rubber:				
To Sweden, Norway and Denmark	94,700	£11,793	141,900	£17,347
Germany	......	....	619,100	75,530
Belgium	120,100	12,181	560,800	68,517
France	3,914,800	404,123	4,408,600	576,609
Spain	163,900	16,608	11,200	1,631
Italy	1,202,000	136,233	1,045,900	130,004
Austria-Hungary	....	....	22,400	3,555
Other European countries	......	....	17,900	2,401
United States	8,585,000	878,446	12,286,000	1,630,407
Canada	53,700	6,005	666,500	90,317
Other countries	133,700	16,893	135,300	17,612
Totals, rubber	14,267,900	£1,482,282	19,915,600	£2,613,930
Waste and reclaimed.........	2,100	90	1,000	37
Gutta percha and balata ...	78,300	13,613	181,800	35,351
Totals, unmanufactured.	80,400	£13,703	183,800	£35,388
Manufactured—				
Boots and shoes . dozen pairs	100	13	6,000	245
Waterproofed clothing	....	248	....	....
Tires and tubes	.. ..	14,210	..... .	17,362
Insulated wire	....	139	....	....
Other manufactures	....	3,509	....	5,002
Totals, manufactured..	......	£18,119	......	£22,609

THE MARKET FOR RUBBER SCRAP.

NEW YORK.

The rubber scrap situation has gone from bad to worse for the past several months. Both domestic and export business have well-nigh ceased.

The reclaimers have not been in the market owing to the curtailment of their manufacturing operations due to strikes and difficulties of shipment, such as car shortage and freight embargoes.

The downward trend of the crude rubber market has been steadily approaching the low record and has seriously impaired both rubber scrap and reclaimed rubber values which move in close sympathy with crude.

Export trade in rubber scrap has been eliminated by reason of a succession of harbor strikes affecting cartage and loading facilities.

Shoes can be purchased from 7⅜ to 7½ cents and standard auto tires from 3¼ to 3½ cents, delivered at mill. The following prices are practically nominal:

QUOTATIONS FOR CARLOAD LOTS DELIVERED.

May 25, 1920.

Prices subject to change without notice.

BOOTS AND SHOES:				
Arctic tops	lb.	$0.01	@	
Boots and shoes............	lb.	.07¼	@	.07½
Trimmed arctics	lb.	.05¼	@	.06¼
Untrimmed arctics	lb.	.05¼	@	.06¼
HARD RUBBER:				
Battery jars, black compound............	lb.	.01	@	
No. 1, bright fracture............	lb.	.23	@	.24
INNER TUBES.				
No. 1	lb.	.16	@	
Compounded	lb.	.09⅞	@	.10
Red	lb.	.08¼	@	
MECHANICALS:				
Black scrap, mixed, No. 1............	lb.	.03½	@	.04
No. 2............	lb.	.03	@	
Car springs	lb.	.03½	@	.04
Heels	lb.	.03	@	.03½
Horse-shoe pads............	lb.	.03	@	.03½
Hose, air brake............	lb.	.04¼	@	
fire, cotton lined............	lb.	.01½	@	.01¾
garden	lb.	.01½	@	.01¾
Insulated wire stripping, free from fiber............	lb.	.03½	@	.04
Matting	lb.	.01¼	@	.01½
Red packing	lb.	.05½	@	.06
Red scrap, No. 1............	lb.	.09	@	.10
No. 2............	lb.	.06¾	@	.07¼
White scrap No. 2............	lb.	.08	@	.09
No. 1............	lb.	.10	@	.11
TIRES:				
PNEUMATIC—				
Auto peelings	lb.	.04½	@	.05
Bicycle	lb.	.02¾	@	.03
Standard white auto............	lb.	.04⅝	@	.04¾
Standard auto	lb.	.03¼	@	.03½
Stripped, unguaranteed	lb.	.02½	@	.02¾
White, G. & G., M. & W., and U. S............	lb.	.04¾	@	.05
SOLID—				
Carriage	lb.	.04	@	.04¼
Irony	lb.	.01	@	
Truck	lb.	.03½	@	.03¾

THE MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

American Cotton. Until the latter part of May, when there was some lively speculation, the market continued steady, prices shifting a few points from day to day around 41.30 cents. April 29 middling upland cotton was 41.35 cents, on May 17 it was 41.60 cents, the lowest point reached in the interval being 41.10 and the highest 41.75. It then shot up, reaching 43 cents on May 20 and 21 and dropping again rapidly to 41 cents on May 22 and 40 cents on May 24, the lowest price reached since March 1; no record of sales on any day of the month.

Planting has been delayed by the weather, rain prevailing in many parts of the South, with a long drought in Texas. It is hampered also by the insufficiency of labor. Yet with late planting a good crop is still possible and no serious shortage is looked for at present. No marked reduction in prices is anticipated for a long time, even if the plan to develop cotton in the British possessions is carried out in earnest, for the supply is not likely to satisfy all the needs.

Egyptian Cotton. After a dull market in Alexandria until the middle of May prices fell rapidly at the end of the third week. English mills would not pay the high prices asked and the American demand fell off, owing in a great degree to the traffic congestion of the railroads. This has compelled automobile manufacturers to suspend construction and lay off their men in some cases, because steel and other materials could not be transported. Consequently the rubber firms cut down production, and the tire builders' pressing need for long staple cotton was eased off. For the new crop, which is late, all the cotton area has been planted, according to some reports, while others say that a part of it has been planted with cereals by government orders. Recent cable advices from Alexandria state that the condition of the growing crop is favorable but the weather has been cool. It is reported that there is about 15 per cent increase in acreage over last season.

Good grade Sakel is worth $1.35 old crop, $1.15 new crop. Good grade uppers can be bought for $0.90 old crop, $1.05 new crop.

Arizona Cotton. Every foot of land available for cotton growing, it is understood, has already been planted, for the growers have last year's experience and profits in mind and know that the Arizona cotton must make up for the loss of Sea Island. The crop has now been practically all sold although there may be 100 to 200 bales still in first hands. This cotton is worth nominally $1.25. The present season will show a large increase in acreage and with seasonable weather a crop of about 90,000 bales should be raised.

Sea Island Cotton. For practical purposes the crop must be

given up for the present, the boll weevil is spreading into all the Southern cotton fields. Exertions are being made in the West Indies to raise the long staple cotton; even if wholly successful the total production will be inadequate.

COTTON FABRICS. There is no change in the prices of tire fabrics as the spinning and the fabric mills are sold up for the rest of the year. The expectation is that cotton prices will ease off and that it is better to see how the crops promise before buying. Yarn prices are unaltered. The demand for future deliveries in ducks and drills is not so strong as it has been, owing in part to the railroad situation, but the immediate supply is still insufficient. In raincoat fabrics there is little demand as buyers are waiting for the lower prices that are hoped for this summer. The market for sheetings shows signs of weakening here and there but the mills hold firm. Business is very quiet, what buying there is being for rubber concerns and automobile fabric manufacturers.

NEW YORK QUOTATIONS.

May 25, 1920

Prices subject to change without notice.

ASBESTOS CLOTH:				
Brake lining, 2½ lbs. sq. yd., brass or copper insertion	lb.	$1.00	@	1.10
2¼ lbs. sq. yd., brass or copper insertion	lb.	1.10	@	1.15
BUILDING:				
[illegible]	100 yards		@	
32—8-ounce			@	
40—7½-ounce		9.00	@	
40—8-ounce		9.25	@	
40—10-ounce		11.00	@	
40—10½-ounce		12.25	@	
45—7½-ounce			@	
45—8-ounce			@	
45—[illegible]			@	
DRILLS:				
38-inch 2.00-yard	yard	.47½	@	
40-inch 2.47-yard		.39¼	@	
52-inch 1.90-yard		.60½	@	
52-inch 1.95-yard		.59¼	@	
60-inch 1.52-yard		.86	@	
DUCK:				
CARRIAGE CLOTH:				
38-inch 2.00-yard enameling duck	yard	.48	@	
38-inch 1.74-yard		.56¾	@	
72-inch 16.66-ounce		1.30	@	
72-inch 17.21-ounce		1.40	@	
MECHANICAL:				
Hose	pound	.82	@	
Belting		.82	@	
HOLLANDS, 40-INCH:				
Acme	yard		@	
Endurance			@	
Penn			@	
OSNABURGS:				
40-inch 2.35-yard	yard	*.35	@	
40-inch 2.48-yard		*.33⅛	@	
37½-inch 2.42-yard		*.34	@	
RAINCOAT FABRICS:				
COTTON:				
Bombazine 64 x 60	yard	.30	@	
60 x 48		.27	@	
Cashmeres, cotton and wool, 36-inch, tan		1.10	@	
Twills 64 x 72		.46	@	
64 x 102		.48	@	
Twill, mercerized, 36 inch, blue and black		.62½	@	
tan and olive		.60	@	
Tweed		.80	@	1.40
printed		.27½	@	
Plaids 60 x 48		.28	@	
56 x 44		.27	@	
Repp		.41	@	.45
Prints 60 x 48		.29	@	
64 x 60		.32	@	
IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING—PLAIN AND FANCIES:				
63-inch, 3½ to 7½ ounces	yard	1.45	@	3.90
36-inch, 2¾ to 5 ounces		.85	@	2.25
IMPORTED PLAID LINING (UNION AND COTTON:)				
63-inch, 2 to 4 ounces	yard	.95	@	1.90
36-inch, 2 to 4 ounces		[illegible]	@	1.15
DOMESTIC WORSTED FABRICS:				
36-inch, 4½ to 8 ounces	yard	$0.85	@	1.90
DOMESTIC WOVEN AND PLAID LININGS (COTTON):				
36-inch, 3¾ to 5 ounces		.27	@	.35
SHEETINGS, 40-INCH:				
48 x 48, 2.35-yard	yard	.36	@	
48 x 48, 2.50-yard		.34	@	
48 x 48, 2.70-yard			@	
48 x 48, 2.85-yard		.31	@	
64 x 68, 3.15-yard		.34	@	
56 x 60, 3.60-yard		[illegible]	@	
48 x 44, 3.75-yard		.27	@	
SILKS:				
Canton, 38-inch	yard	[illegible]	@	
Schappe, 36-inch		[illegible]	@	
STOCKINETTES:				
SINGLE THREAD:				
3½ Peeler, carded	pound		@	
4½ Peeler, carded		1.15	@	1.15¼
6½ Peeler, combed		1.80	@	
DOUBLE THREAD:				
Zero Peeler, carded	pound	.98	@	.98½
3½ Peeler, carded		1.04	@	1.04½
6½ Peeler, combed		2.70¼	@	2.70½
TIRE FABRICS:				
BUILDING:				
17¼-ounce Sakellarides, combed	pound	[illegible]	@	3.[illegible]
17¼-ounce Egyptian, combed		[illegible]	@	2.65
17¼-ounce Egyptian, carded		[illegible]	@	2.55
17¼-ounce Peelers, combed		[illegible]	@	2.55
17¼-ounce Peelers, carded		1.55	@	1.70
CORD:				
15-ounce Egyptian	pound	2.75	@	2.90
BICYCLE:				
8-ounce American	pound	1.60	@	1.80
[illegible]-ounce American		1.50	@	1.80

CHAFER:			
9¼-ounce Sea Island	pound	2.70	@
9¼-ounce Egyptian, carded		2.50	@
9¼-ounce Peeler, carded		1.80	@

*Nominal

EGYPTIAN COTTON CROP MOVEMENT.

FROM AUGUST 1, 1919, TO APRIL 14, 1920.

		1919-1920.	1918-1919.	1917-1918.
To Liverpool	bales	240,537	183,229	155,656
Manchester		138,809	91,087	91,597
Other United Kingdom ports		145	5,537	115,784
Total shipments to Great Britain		379,491	279,853	363,037
To France		45,020	46,602	20,711
Spain		8,390	10,290	4,684
Italy		24,262	32,207	22,651
Belgium		630	....	....
Switzerland		11,906	20,379	3,350
Holland		666	....	....
Portugal		590	....	....
Germany		2,167	....	....
Austria		10,089	....	....
Greece		104	3,963	550
Turkey and other countries		98	....	....
Total shipments to Continent		103,922	113,441	51,946
To United States		271,239	45,954	38,763
Japan		15,911	11,517	12,464
Total shipments to all parts		770,563	450,765	466,210
Total crop (interior gross weight), cantars[1]		......	4,826,342	6,315,841

[1]One cantar equals 98 pounds.
(*Compiled by Davies, Benachi & Co.*)

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

NEW YORK.

DEMAND for chemicals and compounding ingredients of all kinds naturally diminished during the railroad strike, but the relative scarcity of supplies has been still greater in most lines. Prices in general have remained firm with a tendency to advance. The fact that most large manufacturers of rubber goods have been obliged to curtail operations by 50 per cent has had a marked influence on the demand for supplies.

ANILINE. About the middle of the month the price advanced to 37 cents per pound, but later fell to 34 cents owing to increased supply and reduced demand.

BARYTES. There is practically no spot stock and lack of facilities to deliver has created a very difficult situation for producers as well as consumers.

BENZOL. The supply remains very limited and prices firm.

BLACKS. Prices still remain very high. The demand from the rubber industry has notably slackened temporarily due to reduced tire manufacturing output.

CARBON BISULPHIDE. Spot stocks continue to remain low and the price has advanced to 7½ cents per pound.

CARBON TETRACHLORIDE. The demand during the past month has not been excessive. Spot price remains steady at 13 cents per pound.

DRY COLORS. The leading feature has been the persistent scarcity of supplies for dry color manufacture, which has rendered these products very difficult to secure in volume sufficient to satisfy the demand.

LITHARGE. Prices have held firm notwithstanding a lessened demand by users. Deliveries have been impeded seriously by the railroad strike situation.

LITHOPONE. The demand remains practically double the capacity of production. There has been no change in prices.

SUBLIMED LEAD. The demand has been lessened by the strikes, although it remains in excess of productive capacity. There will be no change in prices until general revision of the lead schedule takes place.

SULPHUR. Prices and demand continue steady.

WHITING. Supplies of English chalk remain at low level, although an increase is expected soon. The output of whiting is also lessened by the shortage of labor for its manufacture.

ZINC OXIDE. Production is said to be increasing and higher prices are possible since there is no slackening of the demand from users.

NEW YORK QUOTATIONS.

MAY 25, 1920.

Prices subject to change without notice.

ACCELERATORS, ORGANIC.			
Accelerene, New York	lb.	$4.75 @	
Accelemal	lb.	.55 @	.57½
Aldehyde ammonia crystals	lb.	2.25 @	2.50
Aniline oil	lb.	.35 @	
Excellerex	lb.	.65 @	.75
Hexamethylene tetramine (powdered)	lb.	2.50 @	3.50
N. C. C.	lb.	.50 @	
No. 999	lb.	.22 @	
Paraphenylenediamine	lb.	2.70 @	2.85
Thiocarbanilide	lb.	.55 @	.70
Velosan	lb.	3.70 @	3.85
ACCELERATORS, INORGANIC.			
Lead, dry red (bbls.)	lb.	.12¼ @	
sublimed blue (bbls.)	lb.	.10 @	
sublimed white (bbls.)	lb.	.10 @	
white, basic carbonate (bbls.)	lb.	.10½ @	
Lime, flour	lb.	.02 @	
Litharge, domestic	lb.	.11¾ @	.12¾
sublimed	lb.	.12 @	
imported	lb.	.15 @	
Magnesium, carbonate, light technical	lb.	.11½ @	.14
calcined extra light	lb.	.60 @	
calcined light	lb.	.35 @	
calcined medium light	lb.	.30 @	
calcined heavy	lb.	.07½ @	.08
calcined commercial (magnesite)	lb.	.04 @	0.05
Magnesium oxide, extra light	lb.	.65 @	
ACIDS.			
Acetic, 28 per cent (bbls.)	cwt.	3.75 @	4.50
glacial, 99 per cent (carboys)	cwt.	15.95 @	16.70
Cresylic (97% straw color) (drums)	gal.	1.20 @	1.30
(95% dark) (drums)	gal.	1.10 @	1.20
Muriatic, 20 degrees	cwt.	2.25 @	2.50
Nitric, 36 degrees	cwt.	6.00 @	6.50
Sulphuric, 66 degrees	ton	24.00 @	25.00
ALKALIES.			
Caustic soda, 76 per cent (bbls.)	lb.	.07 @	.08
Soda ash (bbls.)	lb.	.04½ @	
COLORS.			
Black:			
Bone, powdered	lb.	.06 @	
granulated	lb.	.11 @	
Carbon black (sacks, factory)	lb.	.15 @	.30
Drop	lb.	.05½ @	.15
Ivory black	lb.	.16 @	.30
Lampblack	lb.	.15 @	.45
Oil soluble aniline	lb.	1.25 @	
Rubber black	lb.	.09½ @	
Blue:			
Cobalt	lb.	.27 @	.35
Prussian	lb.	1.00 @	
Ultramarine	lb.	.15 @	.50
Rubber makers' blue	lb.	3.50 @	
Brown:			
Iron oxide	lb.	.04¾ @	.06¾
Sienna, Italian, raw and burnt	lb.	.05¾ @	.14
Umber, Turkey, raw and burnt	lb.	.06 @	.09
Vandyke	lb.	.02½ @	.09½
Green:			
Chrome, light	lb.	.42 @	.70
medium	lb.	.42 @	.70
dark	lb.	.50 @	.71
commercial	lb.	.07 @	.15
Oxide of chromium (casks)	lb.	1.25 @	
Rubber makers' green	lb.	3.50 @	
Red:			
Antimony, crimson, sulphuret of (casks)	lb.	.38 @	.40
crimson, "Mephisto" (casks)	lb.	.60 @	
crimson, "R. M. P."	lb.	.65 @	
Antimony, golden sulphuret of (casks)	lb.	.20 @	.22
golden sulphuret (States)	lb.	.30 @	.35
golden, "Mephisto" (casks)	lb.	.33 @	
golden, "R. M. P."	lb.	.33 @	
red sulphuret (States)	lb.	.25 @	.30
vermilion sulphuret	lb.	.55 @	
Arsenic, red sulphide	lb.	.18 @	
Indian	lb.	.14 @	.16
Para toner	lb.	2.25 @	2.50
Red excelsior	lb.	.19 @	.22
Toluidine toner	lb.	4.25 @	
Iron oxide, reduced grades	lb.	.12 @	
pure bright	lb.	.16 @	
Spanish bright	lb.	.04¾ @	.05½
Venetian	lb.	.03¾ @	.07
Oil soluble aniline, red	lb.	2.00 @	
orange	lb.	1.75 @	

Oximony	lb.	$0.18 @
Vermilion, American	lb.	.25 @ .30
artificial	lb.	.37 @
English quicksilver	lb.	1.65 @ 1.75
Rubber makers' red	lb.	3.50 @ 4.00
purple	lb.	2.50 @

White:

Aluminum bronze, C. P.	lb.	.65 @
superior	lb.	.69 @
Lithopone, domestic	lb.	.08 @ .08¼
Ponolith (carloads, factory)	lb.	@
Rubber-makers' white	lb.	.11¼ @
Zinc oxide, Horsehead (carload, factory):		
"XX red"	lb.	.10 @
"Special"	lb.	@
French process, red seal	lb.	.11¼ @ .11¾
green seal	lb.	.12¼ @
white seal	lb.	.13½ @ .13¾
(States)	lb.	@
Azo (carload, factory):		
ZZZ, lead free	lb.	.10 @ .10¼
ZZ, under 5% leaded	lb.	.09 @ .09¼
Z, 8-10% leaded	lb.	.08¼ @ .08½

Yellow:

Cadmium, sulphide, yellow, light, orange	lb.	1.75 @ 2.00
red	lb.	1.85 @
Chrome, light and medium	lb.	.35 @
Ochre, domestic	lb.	.04 @ .07
imported	lb.	.06½ @ .08½
Oil, soluble aniline	lb.	2.00 @
Rubber makers' yellow	lb.	1.50 @ 2.50
Zinc chromate	lb.	.45 @

COMPOUNDING INGREDIENTS.

Aluminum flake (carload)	ton	30.00 @
silicate	ton	30.00 @ 35.00
Ammonia carbonate, powdered	lb.	.17¾ @
Asbestine (carloads)	ton	23.00 @
Barium, carbonate, precipitated	ton	87.50 @ 90.00
sulphide, precipitated	lb.	.05 @
dust	ton	100.00 @
Barytes, pure white (f. o. b. works)	ton	27.50 @
off color	ton	16.00 @
uniform floated	ton	27.50 @
Basofor	lb.	.05½ @
Blanc fixe	lb.	.05½ @
Bone ash	lb.	.10 @
Carrara filler		.02 @
Chalk, precipitated, extra light	lb.	.05 @ .05½
heavy	lb.	.04 @ .04½
China clay, Dixie Blue Ridge	ton	20.00 @
domestic	ton	18.50 @ 20.00
imported	ton	18.00 @ 23.50
Shawnee	ton	20.00 @
Cotton linters, clean mill run, f. o. b. factory	lb.	.03½ @ .04
Fossil flour (powdered)	lb.	.03½ @
(bolted)	lb.	.04 @
Diatomite	lb.	.03 @ .04
Glue, high grade	lb.	.35 @ .45
medium	lb.	.30 @ .35
low grade	lb.	.20 @ .25
Graphite, flake (400-pound bbl.)	lb.	.10 @ .30
amorphous	lb.	.04 @ .08
Ground glass FF (bbls.)	lb.	.03 @
Infusorial earth (powdered)	lb.	.03½ @
(bolted)	lb.	.04 @
Liquid rubber	lb.	.18 @
Mica, powdered	lb.	.15 @
Fumice stone, powdered (bbl.)	lb.	.05 @ .08
Rotten stone, powdered	lb.	.02½ @ .04½
Rubber paste	lb.	.19 @ .22
Rub-R-Glu	lb.	@
Silex (silica)	ton	25.00 @ 40.00
Soapstone, powdered gray (carload)	ton	25.00 @
Starch, powdered corn (carload, bbls.)	cwt.	6.09 @
(carload, bags)	cwt.	5.62 @
Talc, powdered soapstone	ton	25.00 @ 40.00
Terra blanche	ton	22.00 @ 32.00
Tripoli earth, air-floated, cream or rose	ton	50.00 @
white	ton	52.50 @
Tyre lith	ton	60.00 @
Whiting, Alba (carloads)	cwt.	1.00 @
Columbia	cwt.	.80 @
commercial	cwt.	1.40 @
English cliffstone	cwt.	2.00 @
gilders	cwt.	1.45 @ 1.55
Paris, white, American	cwt.	1.75 @
Quaker	ton	16.00 @
Super	ton	30.00 @ 32.50
Wood pulp, imported	lb.	.03¾ @
XXX	ton	75.00 @
X	ton	65.00 @
Wood flour, American	ton	50.00 @

MINERAL RUBBER.

Elaterin (carloads)	ton	[illegible]
(less carloads)	ton	
Gilsonite	lb.	.03¾ @
Genasco (carloads, factory)	ton	62.50 @
(less carloads, factory)	ton	64.50 @
Hard hydrocarbon	ton	[illegible] @
K-X	ton	@
K. M. R.	ton	@
M. R. X.	ton	$100.00 @
Pioneer, carload, factory	ton	55.00 @
less carload, factory	ton	60.00 @
Raven M. R.	ton	50.00 @ 70.00
Refined Elaterite	ton	@
Richmond	ton	75.00 @
No. 64	ton	44.00 @
318/320 M. P. hydrocarbon	ton	50.00 @
Robertson, M. R. Special (carloads, factory)	ton	75.00 @ 80.00
M. R. (carloads, factory)	ton	57.50 @
M. R. (less car loads factory)	ton	60.00 @
Walpole rubber flux (factory)	lb.	.05 @

OILS.

Avoilas compound	lb.	.16 @ .18
Castor, No. 1, U. S. P.	lb.	[illegible] @
No. 3, U. S. P.	lb.	[illegible] @
Corn	lb.	.18½ @
Corn, refined Argo	cwt.	20.06 @
Cotton	lb.	.19½ @
Glycerine (98 per cent)	lb.	.23½ @ .24
Linseed, raw (carloads)	gal.	1.67 @ 1.7[illegible]
Linseed compound	gal.	.85 @
Palmoline	lb.	.16 @ .17
Palm (Lagos)	lb.	.15 @
Peanut	lb.	.19 @
Petrolatum	lb.	.10 @
Petroleum grease	lb.	.07½ @ .09
Pine, steam distilled	gal.	[illegible] @
Rapeseed, refined	lb.	.22 @
blown	lb.	.22 @
Rosin	gal.	.70 @ 1.05
Soya bean	lb.	[illegible] @
Tar	gal.	.38 @ .40

RESINS AND PITCHES.

Balsam, fir	gal.	1.75 @ 1.80
Cantella gum	lb.	.55 @
Cumar resin, hard	lb.	.12 @ .16
soft	lb.	.09 @ .13
Tar, retort	bbl.	15.50 @ 16.50
kiln	bbl.	15.00 @ 15.50
Pitch, Burgundy	lb.	.10 @
coal tar	lb.	.02 @
pine tar	lb.	.04 @
ponto	lb.	.14 @
Rosin	bbl.	16.95 @ 21.75
granulated	lb.	None
fused		None
Rosin, K	bbl.	[illegible] @
strained	bbl.	[illegible] @
Shellac, fine orange	lb.	[illegible] @

SOLVENTS.

Acetone (98.99 per cent drums)	lb.	.24½ @
methyl (drums)	gal.	1.50 @
Benzol, water white	gal.	.28 @ .33½
Beta-naphthol	lb.	.80 @ .85
Carbon bisulphide (drums)	lb.	$0.07½ @ .08¼
tetrachloride (drums)	lb.	.12 @ .14
Naphtha, motor gasoline (steel bbls.)	gal.	.30 @
73 @ 76 degrees (steel bbls.)	gal.	.40 @
70 @ 72 (steel bbls.)	gal.	.38 @
68 @ 70 degrees (steel bbls.)	gal.	.37 @
V. M. & P. (steel bbls.)	gal.	.29 @
Toluol, pure	gal.	.31 @ .36½
Turpentine, spirits	gal.	2.35 @
wood	gal.	@
Osmaco reducer	gal.	.50 @
Xylol, pure	gal.	.35 @ .45
commercial	gal.	.35 @ .40

SUBSTITUTES.

Black	lb.	.10 @ .22
White	lb.	.11 @ .24
Brown	lb.	.15 @ .23
Brown factice	lb.	.11 @ .23
White factice	lb.	.13 @ .25
Paragol, soft and medium (carloads)	cwt.	18.58 @
hard	cwt.	18.08 @

VULCANIZING INGREDIENTS.

Lead, black hyposulphite (Black Hypo)	lb.	.39 @
Orange mineral, domestic	lb.	.15¼ @
Sulphur chloride (drums)	lb.	.20 @
Sulphur, flour, Brooklyn brand (carloads)	cwt.	3.40 @
Bergenport brand (carloads)	cwt.	3.40 @
superfine (carloads, factory)	cwt.	2.00 @ 2.25

(See also Colors—Antimony.)

WAXES.

Wax, beeswax, white	lb.	[illegible]
ceresin, white	lb.	[illegible]
carnauba	lb.	[illegible]
ozokerite, black	lb.	[illegible]
green	lb.	[illegible]
Montan	lb.	[illegible] @ [illegible]
paraffine, refined 118/120 m. p. (cases)	lb.	[illegible]
123/125 m. p. (cases)	lb.	[illegible]
128/130 m. p. (cases)	lb.	[illegible]
Sweet wax	lb.	

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC — GUTTA-PERCHA

Vol. 62 JUNE 1, 1920 No. 3

TABLE OF CONTENTS.

Editorials:
- A Setback to Filipino Progress ... 555
- Guayule Is Rubber, Not a "Substitute" ... 555
- Balata Cultivation ... 555-556
- Air Fords Not as Yet ... 556
- Accidents in Factories ... 556
- Standardization and Golf Balls ... 556
- Minor Editorials ... 556

Rubber (Hevea Brasiliensis) as a Philippine Agricultural Investment. By H. F. Cameron, Lieutenant-Colonel, Engineers, U. S. A. ... Illustrated 557-560

A Layout of a Scientific Rubber Footwear Factory. Diagrams 560-563

Recent Improvements in Testing Machines. Illustrated 563

Motor Truck Efficiency as Related to Solid and Pneumatic Tires ... By S. V. Norton—Illustrated 564-567

Rubber Tariffs of Asia, Oceania and Africa ... 568-570

British Standard List of Rubber Tyres for British Standard Rims. ... Diagrams 570-573

The Goodyear Industrial University. By Ralph C. Busbey—Illustrated 574-575

Practical Tire Repairing. By A. B. Zwebell—Illustrated 576-578

Interesting Letters from Our Readers ... 579-580
Further Study for Native Rubber Plants. Stevens' Sulphur Determination Method. The Rubber Situation of the Philippines. Of Pioneer Stock. Why Not American Rubber Factories in Malaysia? As to Rubber Heel Patents.

Chemistry:
- What the Rubber Chemists Are Doing ... 581-583
  Carbon Black. Benzol Poisoning.
- Chemical Patents ... 583
- Laboratory Apparatus ... Illustrated 583

Machines and Appliances ... Illustrated 584-587
The Mathern Tire Making Machine. Solvent Recovery System. Akron-William Tire Repair Novelties. Champion Tire Building Stands. Machine for Coating Inside of Casings. S. & B. Flexible Steel Molds. High Pressure Sectional Vulcanizer. Honeco Vulcanizer Temperature Controller. Inner Tube Valve Nut Tightener.

Machinery Patents ... Illustrated 587
Mandrel for Tire Tubes. Machine for Making Inner Tubes. Other Machinery Patents.

Process Patents ... 587

New Trade Publications ... 588

Editor's Book Table ... 588
"Report of the Ceylon Chamber of Commerce for the Year 1919." "Aircraft Year Book, 1920." "Report of the Board of Trade of the Empire Cotton Committee, 1920." "Dyke's Automobile and Gasoline Engine Encyclopedia."

New Goods and Specialties ... 589-591
A Safety Axe for the Summer Camper. Combination Ink and Pencil Eraser. A New Overshoe Tire. A New Artificial Bait. Three New Western Tires. An Improved Step-Mat. Three Bathing Caps for Summer Days. Hair Brush with Rubber Cushion. "Adheso" Millinery Glue. Standard and Oversize Cord Tire. A New Fabric-Rubber Sole. Rubber-Insulated Coil-Box Protector. The "Celoglas" Safety Goggle. The "Willson" Safety Goggle. A Valve That Locks the Air in the Tire. Vacuum Cup Ladder Stay. "Duratop" Rubber-Coated Fabric for Auto Tops. Rubber Mats behind the Soda Fountain. It Warns when Tire Is Flat. The "Nokut" Tire Plug. A Reinforced Heel and New Half Sole.

The Obituary Record ... 592-593
O. S. Picher (Portrait). I. F. Stone. M. D. Bendel. J. Kaufman (Portrait). F. T. Carlton. J. P. Wileman.

Inquires and Trade Opportunities ... 593

The Rubber Association of America—Activities of ... 594

American Rubber Trade—News Notes and Personals 595
- Dividends ... 595
- New Incorporations ... 595-596
- Personal Mention ... Illustrated 596
- Eastern Notes ... By Our Correspondent 596-597
- Seamless Rubber Co. ... Illustrated 597
- Canadian Notes ... 598
- New Jersey ... By Our Correspondent 598-599
- Rhode Island ... By Our Correspondent 599-600
- R. J. Fries ... Portrait and Sketch 600
- Massachusetts ... By Our Correspondent 600-601
- Ohio ... By Our Correspondent—Illustrated 601-603
- Mid-West ... By Our Correspondent 604-605
- Mid-West Rubber Manufacturers' Association ... 604
- Pacific Coast .. By Our Correspondent—Illustrated 605-607

Foreign Rubber News:
- Great Britain ... By Our Correspondent 608-609
- Foreign Notes ... 609-610
- Japan ... By Our Correspondent 610
- The Rubber and Cotton Trade of the Netherlands 610-611

Planting:
- Notes from the Far East ... 611-612
- Rubber Tree Diseases ... Illustrated 612

Pneumatic Tread Designs Registered October, 1917, to August, 1918 ... Illustrated 616

Patents Relating to Rubber ... 613-614
United States. Canada. United Kingdom. France. Germany.

Trade Marks ... 614-615
United States. Canada. United Kingdom. New Zealand.

Designs ... Illustrated 615
United States. Canada.

Markets:
- Crude Rubber ... 617
  - Highest and Lowest New York Prices ... 618
  - Amsterdam Rubber Market ... 618
  - Antwerp Rubber Market ... 618
- Reclaimed Rubber ... 617
- Rubber Scrap ... 628
- Cotton and Other Fabrics ... 628-630
- Chemicals and Ingredients ... 630-631

Statistics:
- Brazil, Pará and Manaos Exports ... 622
- Canada, Statistics for January, 1920 ... 626
- Ceylon Rubber Imports and Exports ... 618
- Cotton Statistics ... 630
- Deli (Sumatra) Rubber Exports ... 618
- Federated Malay States Rubber Exports ... 618
- Italy, Statistics for November and December, 1919 627
- Java Rubber Exports ... 618
- Straits Settlements Rubber Exports ... 618
- United Kingdom, Statistics for March, 1920 ... 627-628
- United States:
  - Crude Rubber Arrivals at Atlantic and Pacific Ports as Stated by Ships' Manifests ... 619-622
  - Imports by Months for 1920 ... 618
  - Exports of India Rubber Manufactures During March, 1920 (By Countries) ... 624-625
  - New York Statistics, January, February and March ... 623
  - United States Statistics for February and March 625-626

INDIA RUBBER WORLD

CAOUTCHOUC

FOUNDED
1889

GUTTA-PERCHA

[Reg. U.] S. Pat. Off. Reg. United Kingdom

Edited by HENRY C. PEARSON

Vol. LXII. No. 4. JULY 1, 1920 35 CENTS $3.00 Per Year. $3.50 Abroad.

Entered as second-class matter October 4, 1899, at the post office at New York, N. Y., under the Act of March 3, 1879.
Published monthly at 25 West 45th Street, New York.

Reg. United States Pat. Off. Reg. United Kingdom.

Published on the 1st of each month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.
Telephone—Bryant 2576.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, F.R.G.S., Editor

Vol. 62 JULY 1, 1920 No. 4

Subscription: $3.00 per year, $1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, $3.50 (or equivalent funds) per year, postpaid.

Advertising: Rates will be made known on application.

Remittances: Should always be made by bank draft. Post Office or Express money order on New York, payable to The India Rubber Publishing Company. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

Discontinuances: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

TABLE OF CONTENTS ON LAST PAGE OF READING.

SOLID TIRES NOT DOOMED.

Pneumatic tires have become so important of late that some are predicting the passing of solid tires. The success of cord tire construction and the country's sudden need of rapid freight and express transit have created an abnormal situation. The experience gained has been of much value to tire and truck manufacturers, and to the country. It has shown both the possibilities and the limitations of pneumatic truck tires, but does not show that pneumatics will supplant solids. There is need for both, and both will continue and increase.

The threat of the pneumatic has already served to stimulate development in design, compounds, treads and rims, so that the solid tire is steadily growing better. Where speed or the protection of fragile merchandise is the important factor, the giant pneumatic solves the problem, but where very large and heavy loads of goods not readily damaged can travel more slowly the solid tire answers the purpose and gives longer service at lower cost and with less trouble on the road. Tires must be chosen with respect to the service they will be called upon to render.

The pneumatic is ahead in the race at this moment, but solids and semi-solids are not by any means out of the running.

AMERICAN PLANTATION RUBBER.

Very large areas in the American Southwest will sooner or later be given over to the culture of rubber-producing plants, in the opinion of Dr. Herbert J. Webber, who is recognized as being the foremost plant breeder in the United States. He is also confident that the *Chrysothamnus* could be made to yield 15 or 20 per cent of rubber after improvement through breeding and selection. This, of course, does not mean that *Chrysothamnus* is the best plant for cultivation in the Southwest, but that it is one of the sorts which should be given a trial. In any event, it seems desirable that the rubber investigations being conducted by the botanists of the University of California should be carried through to a definite conclusion.

THE GOODYEAR VULCANIZATION "ACCIDENT."

So many writers describe the discovery of vulcanization in a variety of ways that the true story should be published and emphasized, this for the sake of historical accuracy.

In the first place a "spoonful" of mixture of rubber and sulphur did not accidentally fall on a hot stove, flatten out and become vulcanized. It couldn't. Goodyear's solvent was spirits of turpentine. A mixture, fluid enough to "spoon," falling on a hot stove would bubble, foam and probably burst into flame. At all events the result, spongy, brittle, charred, would not suggest vulcanized rubber.

Nor did a team load of coats on their way from Woburn to Boston catch fire and a charred fragment point the way to the great discovery.

The truth is this: Goodyear was trying to incorporate some sort of dryer in rubber that would permanently prevent rubber clothing from becoming sticky. It was easy to make goods that were free from tackiness for a week or two, but they soon softened and became valueless.

One of his hundreds of experiments was a combination of rubber, sulphur and white lead, dissolved in spirits of turpentine. This was spread with a broad bladed knife on several pieces of cloth. To hasten the evaporation of the solvent he hung the pieces near a stove. One, through accident, rested against the hot iron and turned black, while the others were of a grayish white color. Disgusted at his carelessness Goodyear took the black sample and was about to throw it away when its curious texture halted him. He examined it carefully and recognized what he termed the "change" and which Brockedon later happily termed vulcanization.

This is the story related by men who knew Goodyear, who were rubber men and knew the beginnings of the business. Emory Rider, John Murphy, A. Schlessinger, Henry G. Tyer, Daniel Hayward, J. B. Forsyth, all

pioneers and all in a position to know, in talking with the editor of this journal, agreed as to the main particulars given above.

DANGEROUS DEMANDS OF LABOR.

To a proposal made by labor interests for the incorporation in the Illinois State Constitution of an article declaring that the right of labor to organize and conduct collective bargaining should not be abridged, and that courts should be debarred from issuing injunctions in restraint of strikes and to check their promotion, Charles Piez, president and treasurer of the Link-Belt Company of Chicago, and whose valuable service at the head of the United States Emergency Fleet Corporation is well remembered, interposed a forceful objection in speaking for the Illinois Manufacturers' Association recently at the State Constitutional Convention.

The argument was advanced that the sole purpose of a constitution should be to define the principles governing and the guarantees given all the people of a commonwealth, and it can not justly single out any class or group for special favor; nor should any law-making power or tribunal of justice be inhibited from dealing with abuses of which any class or group may be guilty against the common weal, for the interests of the whole state must always transcend those of any class, be they laborers, capitalists, or members of any other group. Answering the claim that labor has been regarded as property rather than an attribute of life, Mr. Piez cited considerable legislation recently enacted, with the aid of employers, to lessen working time, to make mines and factories safer and more sanitary, to set a fair minimum wage, for accident relief, to lighten women's labor, and to check child employment. Nor has any law been passed to deter workmen from associating for any peaceful purpose.

Particularly did Mr. Piez object to the incorporation in the basic law of the state of an article giving organized labor such an unfair and unwarranted advantage over employers as to compel the latter to submit to dealing only with representatives of a trade union instead of with individual employes. To make such a concession, he implied, would be to strike a blow at the foundations of industrial liberty. In return, it would provide no restrictions to safeguard public interests and impose no collective responsibility on labor organizations in carrying out wage or time bargains, just as now practically no redress is afforded an employer whose property is damaged by strikers. If capital is to be held to account, labor cannot escape its obligations while insisting on its rights. The speaker, while freely conceding the privilege of employes to quit work, contented that, at least, the quitters should not be allowed to coerce others "to refrain from work, with a bludgeon, or through the more cruel and effective method of intimidating their wives and children."

The regret is that the sane views of such broad-gage, experienced observers as Mr. Piez are not given wide publicity in the daily press. Indeed, upon the press rests the obligation to discuss these and kindred questions in a generous, judicial spirit, to point out clearly the close interrelation of capital and labor, and, recalling the Æsopian fable of the quarrel of the body and its members, to emphasize how dependent one is on the other, to stress the need of coordination.

Many great newspapers are strangely reluctant about discussing frankly the onerous exactions of some labor unions and their retardation of output, which makes goods scarce and dear. Their silence strengthens the impression that they either fear labor or cater to it for an ulterior purpose. Some are so anxious to win mass circulation that they not only gloss over or ignore the most palpable delinquencies of unionism, but they even stir up class hatred by affecting to defend the most irrational demands of labor; that is, so long as such demands do not affect the interests of those "welfare of the masses" journals.

TRUCK TRAINS AND TIRES.

In the motor truck road train may be found a solution of the freight transportation problem of the near future. This train consists of one large truck drawing two or more trailers of special design. The trailers are equipped with airbrakes and a steering mechanism assuring perfect tracking, the whole being controlled from the driver's seat. Longer trains can be handled quite as easily.

This method means greatly increased load capacity at the minimum cost of operation in initial investment, fuel consumption, repairs and labor, only one man being required to drive. Such a train has all the mobility, speed and flexibility of operation typical of ordinary truck hauling, and it congests the road less than would three motor trucks operating independently.

Motor truck road trains have been extensively used abroad, but for the most part with iron or solid rubber-tired wheels which have rendered them slow going. The giant cord pneumatic developed in America, however, should add speed to their great carrying capacity and multiply the use of this newest type of rubber tire.

Not specifically of the United States but of the whole world, Akron stands as the real "Rubber City." No other city, county, or state in our Union approaches it in rubber factories, number of employes, and product. Only two foreign countries exceed it in production of rubber goods.

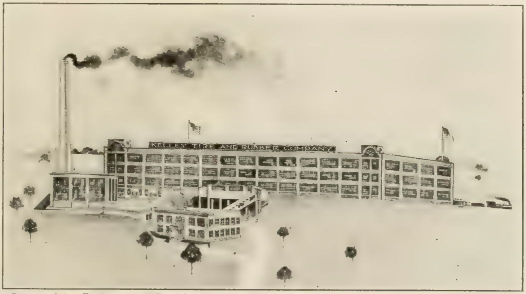
The last census shows that with a population of 208,435 persons, an increase of 139,368 during the last decade, Akron's rate of growth has been 201.8 per cent. Due chiefly to the remarkable expansion of its rubber business it now ranks next to St. Paul, Minnesota, in the list of great American cities.

A Modern Tire Plant Layout.

By M. A. Pearson[1]

In planning a modern tire factory there are many problems to be considered that involve the best engineering practice combined with practical knowledge of tire building. There is also a great difference of opinion on important points as to the method of manufacture and also the lay-out of a modern tire factory.

Large modern plants have three to six-story building units and, to accommodate their phenomenal growth of the past few years, changes in the location of departments have been frequent. One of the first companies to manufacture pneumatic tires is now erecting a large plant at Buffalo on the one floor plan. This method, of course, is very practical but a considerable area of land is required to build a plant on this plan for large production. A smaller plant will produce much better results in a building about 80 feet wide, 280 to 300 feet long and two to three stories high. If the machines required for the manufacture of pneumatic tires and tubes are laid out properly the maximum production can be reached and there will be very little lost motion throughout the entire plant. A material saving can be effected, moreover, by the use of gravity.



(Designed by E. Raymond Throsby.)

Perspective View of a Modern Tire Plant.

LOCATION.

The plant should be located close to ample water supply and economical electric current should be available. The water should be analyzed to discover if it has any undesirable properties. It is also desirable to locate the plant near the railroad, so that a siding can be obtained as well as advertising to the traveling public.

In many instances an ample water supply is not available when all other points that have to be considered in the location, such as transportation facilities, etc., are met with. In such cases there can be installed what is known as a spray or cooling pond, connected to the city mains and the water cooled and used over again.

POWER, HEAT, AND LIGHT.

It is generally found to be more economical to buy electric power, the higher voltages being stepped down by transformers which should be placed in a fire-proof building. Alternating current is satisfactory for all purposes except calenders where two-voltage direct current is necessary to give a 4 to 1 speed range. The same applies to tubing machines for which variable speeds are preferable, where direct drives are applied.

To secure this direct current a motor generator set or rotary converter is necessary. The rotary converter is more economical and efficient but more difficult to repair under ordinary conditions.

Other power house equipment includes boilers of sufficient capacity to supply steam for heater presses, vulcanizers, mills, calenders, dryers, pumps and heating.

The lighting required is a good industrial lighting unit with the exception of around the calenders, where a special unit is required so that there will be sufficient light both in front and back of the calenders. The lighting unit for the plant as outlined is one light to a bay, the bays being 20 feet square.

FIRST FLOOR.

WASHING ROOM.

For a daily production of 450 tires using 25 per cent of wild rubber, two 16 by 36-inch cracker-washers can wash the rubber in six hours. The initial washer installation should consist of one 16 by 36-inch machine with a 75-h.-p. drive suitable for a future cracker-washer of the same size. A soaking vat, cutting machine, and drying apparatus will complete the washing room equipment.

MILL AND CALENDER ROOM.

The mill line should consist of a unit of three 22 and 20 by 50-inch mills with a 250-h.-p. drive. Mill No. 1 to be used for breaking down and mixing. Mill No. 2 for mixing and mill No. 3 for mixing and warming up the calender stock. A mixer located next to the mill unit can be used to advantage in preparing rubber for the mills.

The calender should be not less than a 24 by 66-inch 3-roll machine with a 100-h.-p. drive. The delivery speed ranges from 10 to 40 yards per minute for which a 100-h.-p. direct current, two-voltage variable-speed motor is used.

Additional equipment includes fabric dryer, tube machines for beads and treads, cooling tables, stock bins, sifting machines, etc. Endless cable bead wire has met with almost universal success and can be purchased in the various sizes. A machine has been developed that should be installed for insulating the bead wire.

The fabric dryer is a three-roll reversible machine operated from one side and requires very little floor space. This should be located at the rear of the calender. One 3-inch tubing machine with a 7½-h.-p. alternating-current motor drive easily cares for all bead requirements. A 6-inch tubing machine will provide enough treads for all sizes up to and including 6-inch. A 25-h.-p. variable-speed direct-current motor is used.

HYDRAULIC PLANT.

The accumulators, pumps and air compressors are located in the main building adjacent to the heater presses.

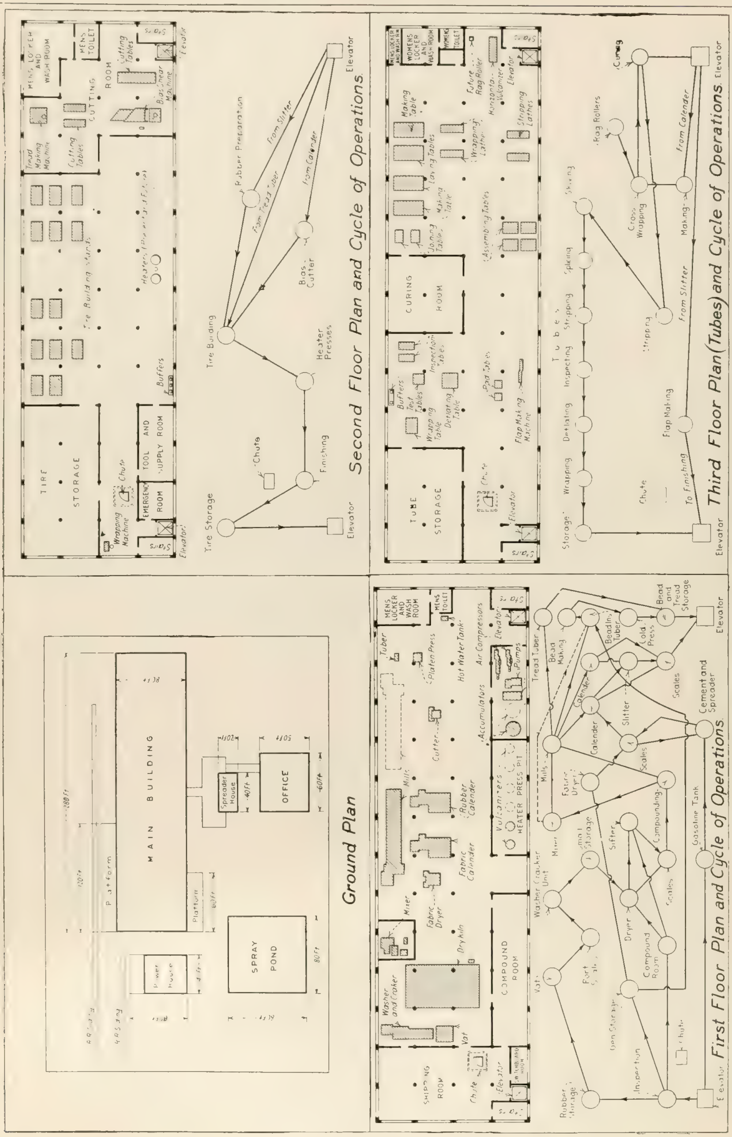
SPREADER BUILDING.

The spreading or impregnating of fabric must be done in an absolutely fire-proof building. The cement-mixing room must also be separated from the spreader room by a fire wall. Equipment for this department should include churns and impregnating machines.

SECOND FLOOR.

The second floor is devoted entirely to building, curing, and finishing casings. The necessary equipment will include one bias-cutting machine, heater presses, tire-building stands, cores, molds, tables, etc.

[1]Engineer in charge of eastern and export sales for the Allen Machine Co., Erie, Pennsylvania.



Plans and Cycles of Operation of a Modern Tire and Tube Plant.

MOLD AND CORE EQUIPMENT.

This equipment is of great importance. In designing a non-skid tread considerable expense can be saved by using a design which will eliminate, as far as possible, all hand work in connection with the manufacture of the mold. This can often be done without affecting the qualities of the non-skid design. Collapsible cores are used, and as air bags are necessary for curing cord tires a complete mold equipment for their manufacture should be installed. Additional equipment will include base rings for molds, bead placing rings and bead molds.

EMERGENCY ROOM.

The emergency or hospital room is located on this floor, adjacent to the elevator. While the more serious accidents occur in the mill and calender room on the main floor, minor accidents are more frequent on the second and third floors. This room should be sanitary, and in fact a miniature hospital completely equipped and managed by a competent physician.

THIRD FLOOR.

The third floor is devoted entirely to tubes. The tube vulcanizer should be equipped with extra inside carriages and transfer carriages to secure full production. Wrapping and stripping lathes, skiving machines, nut tighteners, flap machines and deflating machines are all necessary equipment. Building tables and splicing equipment, where the acid cure is used, can be built at the plant.

The plant here outlined provides for an initial capacity of 500 casings and tubes per day and is designed for an ultimate capacity of 2000 tires a day without any material changes in the building. Additional equipment and three shifts will be necessary to reach this production.

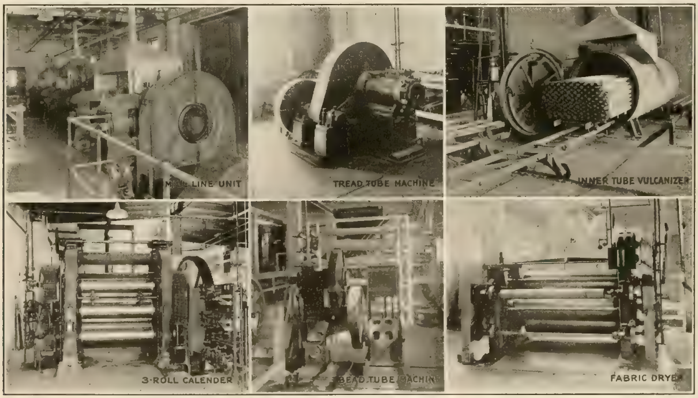
Below are outlined the various operations from the receiving to the shipping room, showing the machinery, connections and small tools required for each operation, and followed by pertinent remarks.

Operation.	Machinery.	Connections.	Small Tools.	Remarks.
Receiving room.	1 dormant scale, 1,000 pounds capacity.		Saw, hatchet, hammer, cold chisel hand hooks, crow bars, hand trucks.	The scale is required to weigh all material received by the factory.
Inspection table.				All material received should be inspected before entering the factory.
Compound room.				Fairly large room. Uniform temperature should be kept at all times.
Rubber storage.				Located in the basement. Should be cool and protected from the sun.
General fabric storage.				An inspecting machine should be installed which would also measure fabric so that claims could be made in case of shortages.
Fabric drying.	3-roll reversible fabric dryer.	Steam.		
Cement and spreader.	Battery of three 200-gallon churns and 16-foot spreader or impregnating machine with double coil.		Gas can, cement cans, scoop pans, knife, scissors, castor-truck.	This should be in a separate building, absolutely fireproof, divided by fire-wall. The equipment should not be direct-drive type on account of the fire hazard. A motor is located in a small pent house to operate both churns and spreader by belt drive.
Gas storage.	1,000-gallon tank, also pump.		Gas cans, funnels.	
Vat.	Poured concrete, waterproofed, made in any desirable shape.	Steam and water.		For soaking rubber.
Weighing.	Portable platform scales.			
Cracker and washer.	Two 16 by 36-inch cracker-washers direct 75 h. p. drive.	Steam and water.		This operation is very important as it is imperative that certain grades of rubber should be sheeted as finely as possible to eliminate all foreign matters.
Small storage.				Rubber is stored and placed on racks before going to the drying room.
Drying.	Dry kiln.	Steam and water.	Baskets and wheel truck.	
Sifting.	Sifters.		Compound pans.	Sifting pigments is a very important operation. It is also desirable to dry pigments especially when received in bags instead of barrels. Some pigments collect moisture rapidly.
Weighing.	Three table scales.			
Compounding.	Long table racks.		Wheel trucks, knives, scoops, scissors, compound pans, small pans.	
Mixing.	Mixer (enclosed.)	Steam and water.	Wheel truck and compound pans.	
Milling and warming.	1 unit of three 22 by 20 by 60-inch mills direct 250 h.-p. drive.	Steam and water.	Mill knives, butcher knives.	Mill No. 1 to be used for breaking down and mixing. Mill No. 2 for mixing and mill No. 3 for mixing and warming up stock for calender.
Frictioning, etc.	1 - 24 by 66-inch, 3-roll calender, 100 h. p. direct drive. The delivery speed ranges from 10 to 40 yards per minute.	Steam and water.	Knives, scissors, 2 hand trucks with cradles, 2 cradle trucks.	
Weighing.	Portable platform scales.			
Cutting and slitting.	Cutting and slitting machine, direct 5-h.-p. drive.		Knives, scissors, truck.	The machine is used for cutting stock for tubes, side walls, cushions, etc., for tires.
Weighing.	Portable scale.			
Fabric cutting.	Bias cutter, cutting tables, stock racks, liner cleaners, liner wind-up.		Books, liners, knives, stitchers, scissors, etc.	
Rubber preparation.	Tables.			
Tread making.	6-inch tuber, 25-h.-p. direct drive.	Water and steam.	Books, scrap boxes, scrap truck.	
Bead making.	Cold press with hot platen.	Water and steam.		
Insulating.	3-inch direct-drive tubing machine.	Gas, water and steam.		
Bead making.	Bead machine, stand for bead reels, table, bead-covering device.		Scissors, knives, rack for reels.	
Bead storage.	Bead drums, racks.			
Tire building.	Building stands, cores, stock racks, stripping table, tool boxes, stand for finished tires. Four jacks.		Rollers, stitchers, knives, scissors, etc. Gas cans, cement cans, wrenches, hammer, scrap boxes, core racks, base rings, racks, wheel truck.	
Vulcanizing.	Heater presses, 2 accumulators, temperature controller stand for molds, overhead trolley.	Air, steam, and water.	Wrenches, cracking bars, stripping bars, soapstone can, brushes, etc., molds, rings, etc.	
Finishing tires.	Buffing, painting, wrapping, trimming.	Air.	Swabs, brushes, knives, hand trucks, scissors, etc.	

Operation.	Machinery.	Connections.	Small Tools.	Remarks.
Tire and tube storage.	Storage racks, scales.			This room is located on the second floor directly above the shipping room. All windows are painted a dark color so that a cool, uniform temperature may be maintained at all times.
Tube making	Poles, stock racks, pole storage, cross stands, making tables, pad table.		Die for cutting pads, knives, scissors, rollers, stitchers.	
Cross wrapping	Wrapping machine, 3 h p. direct drive.			
Tube curing.	Horizontal vulcanizer, temperature controller.	Steam, air, and water.		
Tube stripping.	Stripping lathe.	Air		
Tube buffing.	1 skiving machine, valve in setter, nut tighteners direct drive, fractional h. p. required.		Gage for joint	
Tube splicing	Splicing mandrels, splicing stands.	Air	Acid cans, brushes, etc.	
Tube stripping.	Portable racks.			
Inspecting.	Tank.	Water and air.		
Deflating.	Deflating machine, vacuum pump.			
Wrapping.	Table.			Tube wrapping for shipping.
Flap making.	Flap machine, flap molds. tables.		Jack, scissors, knives, dies, etc	
Rag rolling.	Rag roller, direct 1-h.-p. drive	Water		Works in connection with stripping lathes.
General stock room, 2nd floor.	Racks, bins, tables, scales.			

PROGRESS OF FABRIC.

As soon as the fabric is received it should be inspected and tested to see if it meets with specifications. After inspection the fabric is placed in general storage; from thence it is taken to the fabric dryer to eliminate all moisture. After the drying operation the cord fabric should be weighed before sending to the spreading room and it should also be weighed after the spreading operation. The fabric is taken from the fabric dryer to the calender, and impregnated fabric is also sent direct from the spreading room to the calenders. After the calender operation the fabric is sent to the cutting and slitting machines to be cut into proper sizes for building of tires.



Interior Views in a Modern Tire and Tube Plant.

ROUTING OF RUBBER.

The rubber after being inspected and weighed is stored in the basement, which provides a cool, dry place. As needed it is taken to the washing room. It is not the practice of some manufacturers to wash plantation rubber, as they claim that washing and subsequent drying weakens the rubber. However, if it is not thoroughly washed there is the chance that some foreign matter or fermentation will remain in the rubber, eventually causing trouble. Constantly improving methods of handling plantation rubber may possibly in the future eliminate the washing operation.

When the rubber has been broken down and finally sheeted, it is placed in storage until it is ready for the dryer. From the dryer it goes to the scales—and from there to the compound room, where it is apportioned to the various compounds and sent to the mixer or breaking down and mixing mills. From mixing and warming mills the stock is sent to the calenders and to the tube machines. From the calenders the sheeted stock is delivered to the slitting machines for preparation for tubes while the frictioned fabric goes to the slitting machines and cutting tables.

IN CONCLUSION.

From the above it will be noted that the first operation starts in the basement of the building and the final operation ends there. This department is used for both receiving and shipping. It will also be noted that the majority of the operations are performed on the first floor and located in the most suitable place to allow for expansion at any time, that is, installing additional mill lines, calenders, etc.

It will also be noted that all materials move in one direction on the first floor and on the second and third floors they move in the opposite direction so that the finished materials will arrive directly above the shipping and receiving room. An elevator and chute are located at this end so that all materials can be easily handled.

The repair and maintenance department is located in the basement. A laboratory for testing and experimenting is almost a necessity and can be located on the second floor or adjacent to the factory superintendent's office.

Equipment for these two departments will vary depending on the amount of work of this character that it is desirable to accomplish in the initial unit.

MORE ABOUT JAR RINGS AND POISONED OLIVES.

THE article on jar rings and poisoned olives that was published in THE INDIA RUBBER WORLD, May 1, 1920, elicited the following comments from prominent manufacturers of rubber jar rings.

BOSTON WOVEN HOSE & RUBBER CO.

The Bureau of Chemistry of the Department of Agriculture authorizes the statement that it has met with a gratifying degree of cooperation on the part of packers of ripe olives in improving methods to such an extent that danger from botulinus poisoning in future packs will be eliminated. Five groups of deaths traced to poison produced by the organism known as bacillus botulinus have occurred in New York City, Detroit, Michigan, Canton, Ohio, Memphis, Tennessee, and Kalispell, Montana. All of these cases were due to the consumption of ripe olives. No fatalities have been traced to green olives.

Very extensive investigations have been made by scientists from the Bureau of Chemistry with the cooperation of the packers and the packers also have employed specialists to study the causes of botulinus poisoning and the precautions which should be employed to prevent further difficulty. The experts agree that the trouble is not inherent in the type of container used. Whether the olives be packed in glass jars or in tin cans, they may be rendered absolutely safe if proper precautions are taken to prevent the infection with bacteria during handling and if the packages when filled are sterilized at a sufficient temperature and for a sufficient period of time. It is entirely practicable, say the specialists, to sterilize both glass containers and tin cans at a temperature high enough to insure absolute sterilization.

Unfortunately some packs of ripe olives put up in glass as well as some in tin during past seasons were not prepared with all the precautions now known to be essential and were not sterilized at a sufficiently high temperature and some of these goods in glass were responsible for the fatalities. It is probable that of all the ripe olives on the market but an extremely small number actually contained botulinus. Of more than 2,000 individual packages collected and examined in the Bureau of Chemistry but eight were found to contain botulinus, and seven of these were from the output of one manufacturer and from one batch of his output. In addition to these eight, the bureau has examined samples of some of the olives responsible for the fatalities and has also found botulinus in these specimens.

Since there is a possibility of danger from any ripe olive which has been insufficiently sterilized the Bureau of Chemistry has suggested to the industry that all ripe olives in glass or in tin wherever located be carefully inspected and that any which show the slightest degree of decomposition be destroyed. It has further suggested that all ripe olives which have not been processed at a sufficiently high temperature be returned to the packers for immediate reprocessing at a sufficient temperature to insure complete sterilization.

With few exceptions the olive packers have most heartily fallen in with all suggestions made in the interest of the public safety and by mutual agreement entered into by practically all of the packers they are now taking steps to withdraw from the market all ripe olives in glass containers which have not been sterilized at a sufficient temperature. Similar steps are being taken by some of the packers in the case of minced olive relishes in view of the fact that one death due to the consumption of such a product has been reported.

While concerted action to remove ripe olives packed in tin and processed at a low temperature has not been taken by the packers, the fact that spoilage in tin has so consistently resulted in making a "swell" out of the can constitutes a warning to the purchaser which is not often disregarded. There is no reason to anticipate danger from properly packed and processed ripe olives, whether they be packed in tin or glass containers.

THE MANHATTAN RUBBER MANUFACTURING CO.

In an article that appeared in the "Literary Digest" of May 1, it was claimed that ripe olive poisoning was an infection from the botulinus germ present in the rubber rings used on the glass jars.

While we are not an authority on germs and would not recognize the botulinus if we met him face to face, we do feel that we are perfectly competent to refute the statement that this or any other germ can exist in a rubber jar ring. If rubber goods are subject to infection, and we certainly do not believe they are, it is high time that we took a trip around to the various hospitals and insisted upon their giving up the use of surgical rubber gloves, rubber tubing, sheeting, and many other rubber articles which they use; and where is there any line of work in which more care is needed for cleanliness and sterilization than in a hospital? In fact, life often depends upon the sterility of a piece of rubber goods.

In the manufacture of a rubber jar ring there is about as much chance for the germ to exist as there is for the proverbial snowball. The rubber which is used in jar rings is first very carefully washed with hot water to free it from all foreign particles. It is then mixed with chemically pure materials, one of them being sulphur. The sulphur, itself a very good disinfectant, is present in all rubber goods, and acts as an excellent germicidal agent. A careful examination of a piece of rubber goods will reveal a grayish substance that completely covers the surface of the article. Sometimes this condition is more noticeable than at others, but it is always present. It is caused by an efflorescence of sulphur and is known in the rubber trade as "bloom." This covering of sulphur serves as a very efficient protection against any germs. During the process of manufacture, the rings must go through a heating process in live steam for about two hours at about 290 degrees F. Therefore, it would be rather a hardy germ that would be able to live through such a process as this. In fact, we doubt if the germ has been discovered that would stand this particular treatment. The rings are then packed in sanitary and carefully sealed boxes, and are ready for the consumer. To our mind it is absurd that any germ, even the botulinus, could exist in a rubber jar ring after it has been through the regular manufacturing process.

A RUBBER COLD-WATER BOTTLE.

One of the manufacturers of rubber goods recommends filling its "Black Beauty" hot-water bottle with cold water for use in keeping cool in summer. This bottle has the special "C-Kure-Neck," described in THE INDIA RUBBER WORLD, March 1, 1918. (The Miller Rubber Co., Akron, Ohio.)

Tire Fabric and Long-Staple Cotton.

By L. W. Alwyn-Schmidt, Consulting Economist.

IT HAS BEEN ESTIMATED that 50,000,000 tires will be required during the present year and that 60,000,000 at least will be needed to cover the requirements of 1921. On the basis of this consumption the American tire industry will need approximately 315,000,000 pounds of tire fabric, which to produce will consume nearly 400,000,000 pounds of cotton. Experts say that the available supply of long-staple cotton will hardly be sufficient to cover this year's demand and will fall 70,000,000 pounds behind requirements during the coming year. Who will doubt, then, that the fabric situation is to-day one of the most important problems of the automobile tire industry?

It seems paradoxical that such a situation should occur in the United States, the largest cotton-producing country of the world. But the fact cannot be denied, and at the present time no other remedy can be found than to acquire as much of the foreign long-staple cotton as may be induced to come to our market. The boll weevil and the indolence of our cotton growers are both to be blamed for this situation. Having had a practical monopoly for many years in the production of the best long-staple cotton, so absolutely essential to the manufacture of many cotton fabrics, our cotton growers have permitted not only this monopoly to pass from their hands but have also looked on while the pest destroyed what was left of the former possessions. To-day the Sea Island production is practically negligible and the American tire industry is dependent upon foreign producers for one of its most important raw materials. Of the best Sea Island quality there is not enough produced to go around, and the fact that approximately half of it is grown in our own market is immaterial. Of the lower grades of Sea Island and the best Egyptian product less than 10 per cent are produced in the United States, while England controls 89 per cent of it by way of the British Empire and the occupation of Egypt. Moreover, 70 per cent of the lower grades, comprising Egyptian, American, and the Peruvian group of long-staple cottons, is produced inside the British Empire. Of course, steps have already been taken to remedy the situation, but the excellent results obtained so far in various sections of the United States cannot satisfy the increasing demand for the product coming from the American tire industry and other industries that are buyers of this grade of cotton.

The wave of high prices, produced by the war, is now well past its crest and the chances are that prices will decline. The break having started in one part of the market will soon spread to other branches of the industry and it is difficult to see how the tire industry can keep up prices if reductions in many other fields become necessary. Experience has shown that, whenever there is a general decline in prices, a downward movement independent of the cost of production usually follows, resulting in financial loss to those factories who are caught napping. Two alternatives are left to an industry in such a situation. One is to get out of business and the other is to increase the supply of the raw material, which in this instance is long-staple cotton.

LOCATION OF VISIBLE SUPPLIES.

There is no doubt that the latter way will recommend itself most favorably to our tire manufacturers. It is the only alternative that will make possible the continuation of business and avoid an all around reduction in the fabric specifications of the American automobile tire. But the possibilities of adding to the existing resources of long-staple are only in part within the reach of our cotton consumers. Of the available supply of 1921, estimated to be 330,000,000 pounds, approximately only one-quarter is expected to consist of American cotton. Practically all the rest, excluding small quantities located in Peru, is to come from Egypt.

The determination of the price of the article, therefore, does not lie in American hands. The market point of gravity has changed to England and it is England also that will make the price. No doubt England does not intend to put undue pressure upon the American tire manufacturer in search of long-staple cotton, but the situation is one that deserves the closest attention of all who are interested in the production of tire fabrics and the making of tires.

Long-staple cotton, as represented by Sea Island and Egyptian, is a variety distinct from other grades and qualities. It thrives in certain regions of the world where conditions are especially suitable for its propagation. But it seems to have its real home in the Sea Islands. Only the climate and soil of these islands produces from year to year that fine quality and length of staple that is the characteristic of this cotton. In all other countries where it has been introduced with the aid of seed brought from the Sea Islands, it shows a tendency to deteriorate, and must be improved by occasionally introducing new seed. The best staple is produced in the British West Indies. A somewhat inferior quality is grown in Florida, Georgia, and, during recent years, in Arizona. Some of it is grown in the West Indies, but to-day the bulk of the supply finds its origin in Egypt. That country also produces by far the largest quantity of long-staple cotton in the world and, together with its large output of Sea Island, dominates the long-staple cotton situation. In fact the predominance of Egypt in this respect has been felt to be a distinct disadvantage to international cotton trading, as it makes the world's cotton industry dependent on one market for nearly three-quarters of its total requirements of long-staple cotton. The small production of long-staple cotton in the United States or that of Peru cannot really be sufficient to relieve any shortage that would be caused by a sudden breakdown in the Egyptian supplies.

LIMITATION OF EGYPTIAN COTTON SUPPLIES.

Such a breakdown, however, is by no means an utter impossibility. If proof were required for this contention, it is supplied by the recent report of the British Empire Cotton Growing Committee that has made a very intimate study of the conditions of cotton production in the British Empire with the avowed purpose of making the Empire independent of foreign cotton supplies. Egypt comes in for a great deal of appreciation. The report points out the possibility, now unfortunately nearly an accomplished fact, of the likely destruction of the Georgia and Florida Sea Island cotton crops and deducts from this the great importance of Egyptian cotton for the future needs of the Empire. American spinners that consume long-staple cotton have similarly hoped to secure supplies from this source and it is therefore important to state that the Eygptian resources are not at all unlimited, in fact they have already reached a point where little additional production may be expected. Although Egypt appears to be a very large country on the map, its cultivated area is comparatively small, as it is closely narrowed in on both sides by the desert. All in all, 12,000 square miles can be cultivated and it would be utterly impossible to plant all of it with cotton. In fact the great stress laid upon cotton production in Egypt forms to-day a distinct danger to the economic balance of the country which is exposed to very severe risks whenever the crop does not come up to expectations. Also the best cotton, that of the Sea Island variety, grows only in the so-called Nile delta, where the total cultivated area does not exceed 3,100,000

acres. Throughout the whole cotton territory of Egypt cultivation can be carried on only by the aid of irrigation. This has certain definite disadvantages which are not always connected with irrigation in other parts of the world. If the Nile is low or falls early in the autumn, the period of water scarcity begins early the next spring, and if this is followed by a late Nile, the period of scarcity is still more prolonged during the next summer. So even with the protection of the Nile water, scarcity may arise. But in addition, there is also the danger of an oversupply of water, an example of which was given during the year 1908 when one-third of the cotton crop was ruined owing to over watering. Therefore, to make the water supply of Egypt not only permanent but also safe for the consumer, it will become necessary to execute vast schemes of storage and irrigation of which only a beginning is made.

All irrigation is expensive and increases the cost of production. The cost of adding to Egypt's irrigation facilities may be very high and the cotton of that country must feel the effect. The Cotton Growing Committee proposes to open by irrigation a large part of the available land in the delta which would permit the production of an additional 800,000 bales of cotton. The cost of this enterprise is estimated at $180,000,000 or, as the report says, the value of one year's crop at present prices. The addition to the supply might be well worth the expense, but the plan cannot be completed before 20 years at least. So, whatever may be the outlook for our old age, the present does not seem to be materially improved. Finally, Egyptian cotton is attacked just as readily by insect pests as that in the United States. The Egyptian cotton has an enemy of its own, the seed boll worm. It appeared, providentially for its own propagation, during the year 1913, and has not been fought very energetically by the British authorities in view of the more important battles on hand by the summer of 1914. The result is that notwithstanding irrigation, the Egyptian cotton crop is smaller to-day than in former years, a fact that will affect very seriously the tire industry of the world.

ENGLISH TIRE INDUSTRY WILL HAVE FIRST CALL UPON EGYPTIAN COTTON.

The English have a tire industry of their own. If Egyptian cotton should run below the requirements of that industry there is just a possibility that England will provide first for the needs of her own manufacturers and let the others shift for themselves. It is open to England to protect her cotton resources against the foreign consumer by various means without interfering seriously with the general organization of the Empire. An example of what might be done is the recent act of the Indian Council levying an export duty of 15 per cent upon the export of certain classes of Indian hides if exported to points outside the British Empire. With the world running short of long-staple cotton and Egypt being the only source of supply, some similar expedient may suggest itself to the Egyptian Government, and no other source would be left to our tire manufacturers outside our own small production and the not very plentiful supply of Peruvian cotton.

No doubt this situation cannot be permitted to exist for any length of time, and especially when it is considered that all the india rubber consumed by the United States tire industry is also supplied from outside the United States. What such a dependence of an industry upon foreign sources of raw material may mean to any country has been illustrated most recently in the case of our own rubber industry when a special arrangement had to be made with England for the supply of rubber in the early days of the war, and still more by Germany, where whole industries were destroyed from the same cause.

The American tire industry can correct the cotton situation only by aiding in increasing the supply. As the United States is a cotton-producing country and able to produce a long-staple cotton that serves all the purposes of the tire fabric industry, there is no reason why greater efforts toward adding to its supply should not be made at home. The present need is real and it does not permit much further delay. There is an apparent shortage of 70,000,000 pounds in our own industry alone, and the whole tire-producing world is out for whatever can be had of the material. The present shortage will be felt just as severely in Europe. Unfortunately for the consumer, it does not affect the raw material alone but also extends to the industrial equipment.

MORE SPINNING AND WEAVING FACILITIES REQUIRED.

The demand has outgrown the facilities for handling the production. Even if our cotton growers could be prevailed upon to increase the acreage of long-staple cotton and add the required 70,000,000 pounds, it is still doubtful whether we could hold in readiness the spindles and looms necessary for the manufacture of the fabrics. This is a feature of the situation that must not be left unattended. There are sufficient examples in our own economic history where groups of producers were induced to increase their production only to find that the added quantities could not be made ready for the market. Prices declined as the result of such an occurrence and the producer lost confidence in his advisers. The following year less of the product was made available by the farmers than in the years preceding the increase. The same might happen to our cotton growers. Therefore let more equipment be ready in time. Getting additional industrial equipment is more difficult to-day than increasing agricultural production. The main difficulty in the way of accomplishing this is that the tire makers will not be able to pay much higher prices or even the present ones for fabrics in the future. What, then, will be the inducement for the cotton fabric producers to add to the output? Opinions differ as to whether the price of long-staple cotton will be the only factor likely to bring about the desired adjustment of demand and supply.

The production of long-staple cotton offers to the planter a special inducement because, when once firmly established, it brings a better result for the labor and cost expended upon its production than any lower-grade cotton. There will always be planters ready to make a special effort in favor of the better-priced product and if our tire makers are willing to offer to those producers a steady market they will probably find enough cotton forthcoming for their purpose. Such a development, however, cannot be expected to take place inside a year or two. It may take three or even four years before the farmers have caught up with their opportunity and in the meantime the rapidly growing automobile industry may have enormously increased the demand for tires.

TRADE RECIPROCITY SUGGESTED.

In the meantime foreign long-staple cotton must be induced to come to us, and owing to the foreign exchange situation we are fortunately able to pay a comparatively good price for imported cotton without greatly increasing our own expense. Provided, therefore, our fabric makers do find an open market they should be able to secure foreign long-staple cotton, Egyptian or other, at rates commensurate with the existing selling prices for fabrics.

There is, however, another aspect to the present situation. Long-staple cotton for tire fabrics being a product that, at the present time at least, must be imported in limited quantities equal to the consumption, deserves the special protection of those in charge of the foreign trading activities of the nation. The sources from which this cotton can be obtained must be held open to all who require it. Free access to the raw materials of the world has been proclaimed as one of the reasons why the American nation joined the war. It is now to be seen that this right is not taken away from us and that we should be able to buy our long-staple cotton wherever we please, under conditions very much the same as those applying to our foreign competitors.

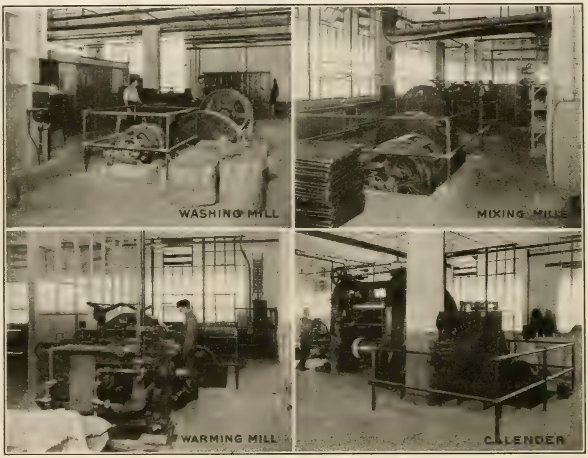
Electric Drive in a Tire and Tube Plant.

By H. F. Barton[1]

ADDING A NEW INDUSTRY to an already diversified group in the city from which it derives its name, the Syracuse Rubber Company affords an excellent example of a young, vigorous and rapidly growing organization. The product consists of cord tires and automobile tubes bearing the trade name of Syra-Cord. Organized in July, 1919, incorporated under the laws of the state of New York with a capitalization of $3,000,000, the company is the only manufacturer of rubber tires and tubes in central New York.

The plant is situated at East Syracuse, a suburb, on the main line of the New York Central Railroad and the electric lines of the New York State Railways. Here the company owns thirty-eight acres of desirable land that will permit the expansion which the present business of the company indicates will be necessary.

Approximately three hundred people are employed at the present time on an eight-hour shift, though it is anticipated that eventually three eight-hour shifts will be employed. The ultimate capacity of the present plant will be approximately twelve hundred casings and three thousand tubes a day based on three eight-hour shifts.



Electrically Driven Rubber Machinery

The present plant, known as Unit No. 1, is a three-story structure of brick, steel and concrete, with an effective working space of twelve thousand square feet on each floor, which is exclusive of hallways, elevator shafts, etc. The design and construction of the building is such as to insure the most efficient handling of all material and any duplication of operations is eliminated. The raw material is unloaded from the cars to the platform thence to the warehouse on the first floor. From here it goes through the washing process, the various mixers, mills and calenders and then to the second floor where the tires are built up.

In line with other progressive and up-to-date methods which this company follows, it adopted electricity as the motive power for driving all of the machines in the plant. Also, appreciating the advantages of purchasing power, electric current is bought from a local company which distributes electric energy transmitted from Niagara Falls, a distance of one hundred and fifty miles.

Alternating current is delivered by the lighting company at twenty-five cycles, three-phase, 11,000 volts to its own outdoor substation. Here the voltage is stepped down by means of three 250-kva. Westinghouse oil-insulated self-cooled transformers to 2,300 volts, the potential required by the larger alternating-current motors used in the mill. The smaller alternating-current motors are supplied through a bank of three 37½-kva. transformers that step down from 2,300 to 440 volts, the voltage for which the motors are wound.

As the calenders have a wide range of speed, direct-current motors are a much more satisfactory form of drive, and this kind of current is obtained from a Westinghouse motor-generator, consisting of a 2,300-volt synchronous-motor direct connected to a 200-kw., 115/230-volt direct-current three-wire generator. This double voltage permits the obtaining of the desired speed range on the motor-driven calender, the lower speeds being obtained on 115 volts and the higher speeds on 230 volts.

A 66-inch calender is connected through a herringbone reduction gear to a 100-h-p. variable-speed direct-current motor that is controlled by an automatic double voltage calender controller providing dynamic braking and operated by a drum type master controller. Safety rods are placed on either side of the calender.

The warming mill, mixing mill and washing mill are each driven by individual Westinghouse alternating-current motors equipped with controllers and solenoid-operated brakes.

The New Haven Sherardizing Co., New Haven Connecticut, has increased its capital stock from $50,000 to $100,000. It has also removed its factory to 868 Windsor street, Hartford, Connecticut, in order to have increased space and room for up-to-date equipment to permit doubling its capacity and make other expansion necessary in connection with contemplated new business with the rubber trade. Orders and correspondence should still be sent to New Haven, as the office of the company will remain there for the present.

[1] Syracuse office, Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania.

Standard General Methods for Testing Cotton Fabrics.[1]

Serial Designation: D 39—18 T; Issued, 1915; Revised, 1916, 1918.

1. The following general methods are intended to be applicable for testing cotton fabrics. Where a material requires special treatment, specific methodes will be described as they are developed for that material and such special tests shall have precedence over the general method.

I. CONDITION.

2. The dry condition of cotton fabric shall be understood to be absolute dryness obtained by placing the material in a ventilated drying oven maintained at a temperature of 105 to 110 degrees C. (221 to 230 degrees F.) and dried to constant weight as determined by two consecutive weighings without removal from the oven, to be taken not less than ten minutes apart, and to show a further loss of not more than 0.1 per cent of the previous weighing.

3. The standard condition of cotton fabric shall be understood to be the condition in which it contains 6.5 per cent of its dry weight of moisture.

II. TEST METHODS.

(A) LENGTH.

4. The length of a roll or piece shall be determined by running the cloth over a measuring drum of known circumference, from which the yardage is registered by a dial or counter driven by a chain or other positive or non-slip mechanism. Just enough uniform tension[2] is to be used on the cloth to keep it running flat and true.

(B) WIDTH.

5. (*a*) The width of a roll or piece shall be determined at five different places uniformly distributed along the full length of the roll or piece, and may be determined at the same time as the total length.

(*b*) The average of the five measurements shall be the width.

(C) WEIGHT.

6. (*a*) PREFERRED METHOD.—The net weight of the roll or piece from which covering and binding have been removed shall be determined. The net weight of the roll or piece divided by its superficial area in square yards shall be taken as the normal net weight per square yard.

(*b*) ALTERNATIVE METHOD.—Three samples of known area, to contain not less than 4 square inches each, shall be stamped (preferably cut with a steel die) from one end of the roll or piece and quickly weighed. The normal square yard weight shall be computed from the average weight of these three samples.

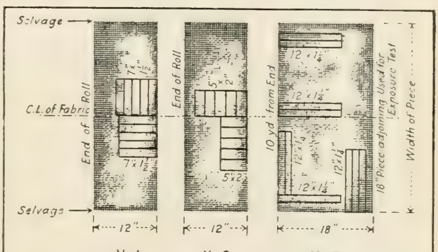
7. (a) PREFERRED METHOD.—For the determination of dry weight two test specimens of approximately equal area, each not less than 4 inches in length and of the entire width of the fabric, shall be cut one from each end of the roll or piece. The one from the outside end of the roll shall be taken as soon as the wrapping is removed and the one from the inner end of the roll as soon as the inner end of the roll has been reached in running the roll. The two samples shall be taken as soon as possible. These samples shall be placed in a dry air-tight container, the weight of which has been previously determined, and carefully weighed therein and then removed (check weight being made on container), the net weight calculated and the sample dried to constant weight in manner described in Section 2. The difference between the original weight of sample and the dry weight is the loss of moisture which when computed as percentage of the dry weight is the percentage regain of the material. The dry weight per square yard is then obtained from the normal weight per square yard as obtained in Section 6 (*a*), as follows:

$$\frac{\text{Normal weight per sq. yd.} \times 100}{100 + \text{percentage regain}} = \text{Dry weight per square yard}$$

(b) ALTERNATIVE METHOD.—From one end of the roll or piece five specimens, each 3 by 4.32 inches, representing 0.01 square yard, shall be stamped (preferably cut with a steel die). Two specimens shall be cut near the selvages, one at the center, and the other two between the selvages and the center. These five specimens, with a total area equal to 0.05 square yard, shall be placed in the wire basket of a ventilated drying oven. The

TABLE I.—TENSILE STRENGTH TEST METHODS.

Method No.	1 Strip Method.	2 Grab Method.	3 Strip Method.	4 Single Strand.
Dimensions of specimens, in.	7 by 1½	5 by 2	12 by 1¼	..
Width raveled to standard or specified threads per inch	1	..	1	..
Min. width of bottom or back jaws, in.	1½	2	1½	..
Width of top or front jaws, in.	1½ (min.)	1	1½ (min.)	..
Distance between jaws, in.	3	1	8	10
Speed of the pulling jaw, in. per min.	20	12	12	12
Number of specimens each, warp and filling	5	5	5	20 strand



NOTES.—1. When material is less than 4 inches wide, the swatch shall be cut 24 inches long and the test specimens shall be laid out in such a manner that no part of any specimen shall come within 2 inches of either selvage.

2. When the specified number of threads or picks per inch is in fraction, the number of threads broken shall include the fraction as a full thread.

TABLE II.—TENSILE STRENGTH: TEST METHOD CLASSIFICATION.

Name of Fabric.	Test Method No.	Humidity Conditions.
Tire fabrics, including		Test specimens shall be tested in a dry condition as defined in Section 2. They shall be taken one at a time from the drying oven and broken in the testing machine within 30 seconds from the time of removal from the oven.
Carcass building fabric	1	
Chafing strip	1	
Breaker strip	1	
Cord fabric	4	
Ducks, including		(*a*) Specimens may be broken in dry condition as specified above for tire fabrics, such tests to be captioned, "Tested Bone Dry." (*b*) Specimens may be tested in their natural condition as taken from the roll or piece and corrected for the moisture present by the method of Section 12, such tests to be captioned, "Corrected for Standard Moisture Regain."
Hose duck	2	
Belt duck	2	
Tent duck	2	
Army duck	2	
Enameling duck	2	
Sail duck	2	
Numbered duck	2	
Drills	2	
Sheetings	2	
Osnaburg	2	
Coutils	2	
Balloon Cloth[1]	1	
Wing fabric[2]	3	Exposed before testing for at least two hours in an atmosphere of 65 per cent relative humidity and 70 degrees F. and tested in this atmosphere.

[1]Balloon cloth shall be tested on machine of the inclination balance type with maximum capacity of 400 pounds.

[2]The elongation of wing fabric shall be observed for each specimen when subjected to loads of 10 pounds, 20 pounds and 70 pounds. Wherever possible autographic records shall be taken.

Note.—Fabrics not included in the above list will be given a test method classification by Committee D-13 on application of those interested.

[1]Reported for adoption, American Society for Testing Materials.

[2]It has been suggested that a uniform tension of 2.5 times the weight of five running yards of the fabric will be sufficient to keep the fabric flat and preserve a proper relation for comparison of different fabrics. Invitation is extended to report to the committee the results of such tests upon different fabrics.

basket shall be so constructed with partitions, not less than ¾-inch apart, that the specimens may stand on edge. The specimens shall then be dried to bone dryness as described in Section 2. The combined weight of these specimens after drying represents the dry weight of 0.05 square yard of the fabric, and the dry weight per square yard of the roll or piece is obtained by multiplying the above quantity by 20.

TABLE OF CORRECTED TENSILE STRENGTHS OF FABRIC AND YARN AT VARIOUS MOISTURE REGAINS.

Apparent Tensile Strength, lbs.	Moisture Regain in Fabric or Yarn.—Per cent of Dry Weight.														
	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00	6.25	6.50
5	5.9	5.8	5.7	5.7	5.6	5.5	5.5	5.4	5.3	5.3	5.2	5.2	5.1	5.1	5
10	11.8	11.6	11.5	11.3	11.2	11.1	10.9	10.8	10.7	10.6	10.5	10.3	10.2	10.1	10
15	17.7	17.4	17.2	17.0	16.8	16.6	16.4	16.2	16.0	15.9	15.7	15.5	15.3	15.2	15
20	23.6	23.3	22.9	22.7	22.4	22.2	21.9	21.6	21.4	21.1	20.9	20.7	20.4	20.2	20
25	29.5	29.1	28.7	28.4	28.0	27.7	27.4	27.0	26.7	26.4	26.1	25.8	25.6	25.3	25
30	35.3	34.9	34.5	34.0	33.6	33.2	32.8	32.5	32.1	31.7	31.4	31.0	30.7	30.3	30
35	41.2	40.7	40.2	39.7	39.2	38.8	38.3	37.9	37.4	37.0	36.6	36.2	35.8	35.4	35
40	47.1	46.5	46.0	45.4	44.8	44.3	43.8	43.3	42.8	42.3	41.8	41.3	40.9	40.4	40
45	53.0	52.3	51.7	51.1	50.4	49.8	49.3	48.7	48.1	47.6	47.0	46.5	46.0	45.5	45
50	58.9	58.2	57.5	56.7	56.0	55.4	54.7	54.1	53.5	52.9	52.3	51.7	51.1	50.5	50
55	64.8	63.9	63.2	62.4	61.7	60.9	60.2	59.5	58.8	58.1	57.5	56.8	56.2	55.6	55
60	70.7	69.8	68.9	68.1	67.3	66.5	65.7	64.9	64.1	63.4	62.7	62.0	61.3	60.7	60
65	76.6	75.6	74.7	73.8	72.9	72.0	71.1	70.3	69.5	68.7	67.9	67.2	66.4	65.7	65
70	82.5	81.4	80.4	79.4	78.5	77.5	76.6	75.7	74.8	74.0	73.2	72.3	71.5	70.8	70
75	88.3	87.2	86.2	85.1	84.1	83.1	82.1	81.1	80.2	79.3	78.4	77.5	76.6	75.8	75
80	94.2	93.0	91.9	90.8	89.7	88.6	87.6	86.5	85.5	84.6	83.6	82.7	81.8	80.9	80
85	100.1	98.9	97.7	96.4	95.3	94.1	93.0	91.9	90.9	89.8	88.8	87.8	86.9	85.9	85
90	106.0	104.7	103.4	102.1	100.9	99.7	98.5	97.4	96.2	95.1	94.1	93.0	92.0	91.0	90
95	111.9	110.5	109.1	107.8	106.5	105.4	104.0	102.8	101.6	100.4	99.3	98.2	97.1	96.0	95
100	117.8	116.3	114.9	113.5	112.1	110.8	109.4	108.2	106.9	105.7	104.5	103.3	102.2	101.1	100
105	123.7	122.1	120.6	119.1	117.7	116.3	114.9	113.6	112.3	111.0	109.7	108.5	107.3	106.1	105
110	129.6	127.9	126.4	124.8	123.3	121.8	120.4	119.0	117.6	116.3	115.0	113.7	112.4	111.2	110
115	135.5	133.7	132.1	130.5	128.9	127.4	125.9	124.4	123.0	121.6	120.2	118.8	117.5	116.3	115
120	141.4	139.6	137.9	136.2	134.5	132.9	131.0	129.8	128.3	126.8	125.4	124.0	122.6	121.3	120
125	147.3	145.4	143.6	141.8	140.1	138.4	136.8	135.2	133.7	132.1	130.6	129.2	127.8	126.4	125
130	153.1	151.2	149.3	147.5	145.7	144.0	142.3	140.6	139.0	137.4	135.9	134.3	132.9	131.4	130
135	159.0	157.0	155.1	153.2	151.3	149.5	147.8	146.0	144.3	142.7	141.1	139.5	138.0	136.5	135
140	164.9	162.8	160.8	158.9	156.9	155.1	153.2	151.4	149.7	148.0	146.3	144.7	143.1	141.5	140
145	170.8	168.6	166.6	165.4	162.5	160.6	158.7	156.8	155.0	153.3	151.5	149.9	148.2	146.6	145
150	176.7	174.4	172.3	170.2	168.1	166.1	164.2	162.3	160.4	158.6	156.8	155.0	153.3	151.6	150
155	182.6	180.3	178.1	175.9	173.7	171.7	169.6	167.7	165.7	163.8	162.0	160.2	158.4	156.7	155
160	188.5	186.1	183.8	181.6	179.4	177.2	175.1	173.0	171.1	169.1	167.2	165.4	163.5	161.7	160
165	194.4	191.9	189.5	187.2	185.0	182.7	180.6	178.5	176.4	174.4	172.4	170.5	168.6	166.8	165
170	200.3	197.7	195.3	192.9	190.6	188.3	186.1	183.9	181.8	179.7	177.7	175.7	173.7	171.9	170
175	206.1	203.5	201.0	198.6	196.2	193.8	191.5	189.3	187.1	185.0	182.9	180.9	178.9	176.9	175
180	212.0	209.3	206.8	204.2	201.8	199.4	197.0	194.7	192.5	190.3	188.1	186.0	184.0	182.0	180
185	217.9	215.1	212.5	209.9	207.4	204.9	292.5	200.1	197.8	195.6	193.3	191.2	189.1	187.0	185
190	223.8	220.9	218.3	215.6	213.0	210.4	208.0	205.5	203.2	200.8	198.6	196.4	194.2	192.1	190
195	229.7	226.8	224.0	221.3	218.6	216.0	213.4	210.9	208.5	206.1	203.8	201.5	199.3	197.1	195
200	235.6	232.6	229.8	226.9	224.2	221.5	218.9	216.3	213.8	211.4	209.0	206.7	204.4	202.1	200
205	241.5	238.4	235.5	232.6	229.8	227.1	224.4	221.8	219.2	216.7	214.2	211.9	209.5	207.2	205
210	247.4	244.2	241.2	238.3	235.4	232.6	229.8	227.2	224.5	222.0	219.5	217.0	214.6	212.3	210
215	253.3	250.0	247.0	244.0	240.0	238.1	235.3	232.6	229.9	227.3	224.7	222.2	219.7	217.3	215
220	259.2	255.9	252.7	249.6	246.6	243.7	240.8	238.0	235.2	232.5	229.9	227.4	224.9	222.4	220
225	265.1	261.7	258.5	255.3	252.2	249.2	246.3	243.4	240.6	237.8	235.2	232.5	230.0	227.5	225
230	270.9	267.5	264.2	261.0	257.8	254.7	251.7	248.8	245.9	243.1	240.4	237.7	235.1	232.5	230
235	276.8	273.3	270.0	266.7	263.4	260.3	257.2	254.2	251.3	248.4	245.6	242.9	240.2	237.6	235
240	282.7	279.1	275.7	272.3	269.0	265.8	262.7	259.6	256.6	253.7	250.8	248.0	245.3	242.6	240
245	288.6	285.0	281.4	278.0	274.6	271.4	268.1	265.0	262.0	259.0	256.1	253.2	250.4	247.7	245
250	294.5	290.7	287.2	283.7	280.1	276.9	273.6	270.4	267.3	264.3	261.3	258.4	255.5	252.7	250
255	300.4	296.6	292.9	289.3	285.8	282.4	279.1	275.8	272.7	269.5	266.5	263.5	260.6	257.8	255
260	306.3	302.4	298.7	295.0	291.5	288.0	284.6	281.2	278.0	274.8	271.7	268.7	265.7	262.8	260
265	312.1	308.2	304.4	300.7	297.1	293.5	290.0	286.7	283.4	280.1	277.0	273.9	270.8	267.9	265
270	318.1	314.0	310.2	306.4	302.6	299.0	295.5	292.1	288.7	285.4	282.2	279.0	276.0	272.9	270
275	323.9	319.8	315.9	312.0	308.3	304.6	301.0	297.5	294.0	290.7	287.4	284.2	281.1	278.0	275
280	329.8	325.6	321.7	317.7	313.9	301.1	306.5	302.9	299.4	296.0	292.6	289.4	286.2	283.1	280
285	335.7	331.5	327.4	323.4	319.5	315.7	311.9	308.3	304.7	301.3	297.9	294.5	291.3	288.1	285
290	341.6	337.3	333.1	329.1	325.1	321.2	317.4	313.7	310.1	306.5	303.1	299.7	296.4	293.2	290
295	347.5	343.1	338.9	334.7	330.7	326.7	322.9	319.1	315.4	311.8	308.3	304.9	301.5	298.2	295
300	353.4	348.9	344.6	340.4	336.3	332.3	328.3	324.5	320.7	317.1	313.5	310.0	306.6	303.3	300
305	359.3	354.7	350.4	346.1	341.9	337.8	333.8	329.9	326.1	322.4	318.8	315.2	311.7	308.3	305
310	365.2	360.5	356.1	351.8	347.5	343.3	339.3	335.3	331.5	327.7	324.0	320.4	316.8	313.4	310
315	371.1	366.4	361.9	357.4	353.1	348.9	344.8	340.7	336.8	333.0	329.2	325.5	321.9	318.4	315
320	376.9	372.2	367.6	363.1	358.7	354.4	350.2	346.1	342.2	338.3	334.4	330.7	327.1	323.5	320
325	382.8	378.0	373.3	368.8	364.3	360.0	355.7	351.6	347.5	343.5	339.7	335.9	332.2	328.5	325
330	388.7	383.8	379.1	374.4	369.9	365.5	361.2	357.0	352.8	348.8	344.9	341.0	337.3	333.6	330
335	394.6	389.6	384.8	380.1	375.5	371.0	366.7	362.4	358.2	354.1	350.1	346.2	342.4	338.6	335
340	400.5	395.4	390.6	385.8	381.1	376.6	372.1	367.8	363.5	359.4	355.3	351.4	347.5	343.7	340
345	406.4	401.3	396.3	391.5	386.7	382.1	377.6	373.2	368.9	364.8	360.6	356.5	352.6	348.8	345
350	412.3	407.1	402.1	397.1	392.3	387.6	383.1	378.6	374.2	370.0	365.8	361.7	357.7	353.8	350
355	418.2	412.9	407.8	402.8	397.9	393.2	388.5	384.0	379.6	375.2	371.0	366.9	362.8	358.9	355
360	424.1	418.7	413.6	408.5	403.5	398.7	394.0	389.4	384.9	380.5	376.2	372.0	367.9	363.9	360
365	429.9	424.5	419.3	414.2	409.2	404.3	399.5	394.8	390.3	385.8	381.5	377.2	373.1	369.0	365
370	435.8	430.3	425.0	419.8	414.8	409.8	405.0	400.2	395.6	391.1	386.7	382.4	378.2	374.0	370
375	441.7	436.2	430.8	425.5	420.4	415.3	410.4	405.6	401.0	396.4	391.9	387.5	383.3	379.1	375
380	447.6	442.0	436.5	431.2	426.0	420.9	415.9	411.1	406.3	401.7	397.1	392.7	388.4	384.1	380
385	453.5	447.8	442.3	436.9	431.6	426.4	421.4	416.5	411.7	407.0	402.4	397.9	393.5	389.2	385
390	459.4	453.6	448.0	442.5	437.2	432.0	426.9	421.9	417.0	412.2	407.6	403.0	398.6	394.3	390
395	465.3	459.4	453.8	448.2	442.8	437.5	432.3	427.3	422.3	417.5	412.8	408.2	403.7	399.3	395
400	471.2	465.2	459.5	453.9	448.4	443.0	437.8	432.7	427.7	422.8	418.0	413.4	408.7	404.4	400

EXPLANATION.—A sample of fabric in its natural state gave an apparent tensile strength of 210 pounds. After drying its moisture regain at the time of the test was found to have been 4.75 per cent of the dry weight. In the line opposite 210 and under 4.75 regain in the table will be found the figure 227.2, the strength of the fabric corrected to a full regain of 6.5 per cent. In the same manner a fabric with an apparent strength of 192 pounds and a regain of 5.25 per cent would have a corrected strength of 202.9 as determined by interpolation from the table.

8. If by the first tests the fabric fails to meet the specifications a second swatch shall be taken as follows: If the roll or piece is a complete warp, the second swatch shall be cut from the center of the roll or piece. If the roll or piece is a part warp, the second swatch shall be taken not less than 1½ yards from the other end.

9. The difference between the normal weight of the fabric, Section 6, and the dry weight, Section 7, is the amount of moisture present.

(*a*) When computed as percentage of the normal weight this is the moisture content of the material.

(*b*) When computed as percentage of the dry weight, this is the moisture regain of the material.

(D) NUMBER OF THREADS PER INCH.

10 (*a*) The number of threads per inch or count of the fabric shall be determined by counting a space of not less than 1 inch in at least five different places in the roll or piece.

(*b*) The average of the five determinations shall be the count.[3]

(E) THICKNESS.

11. (*a*) The thickness shall be measured by an automatic micrometer which presses upon at least 0.5 square inch of the fabric with a uniform constant pressure, and which is so mounted as to make measurements 6 inches from the selvage.

(*b*) At least ten measurements at different portions of the roll or piece shall be made, and the average shall be the thickness of the fabric.

(F) STRENGTH.

12. Tensile strength tests shall be made by one of the four methods described as follows in detail, and fabrics shall be tested by the method shown for the classification under which they fall. In each case the results shall be recorded separately for warp and filling.

For the determination of tensile strength a swatch of the length specified in Table I shall be cut the entire width of the cloth and test specimens shall be cut from this swatch according to the respective diagrams shown at the bottom of Table I.

Two methods of determining the tensile strength shall be recognized:

(*a*) STRIP TEST (FIG. 1).—Under this method a long narrow strip of the fabric shall be clamped at each end by the jaws of the testing machine and strained to the point of rupture.

(*b*) GRAB TEST (FIG. 2).—Under this method the testing machine jaws, each of definite width, shall be made to reach into the body of a rectangular piece of fabric and shall be clamped a definite distance apart. Care shall be taken that the same set of threads are embraced by both pairs of jaws. The specimen shall then be strained to the point of rupture.

13. CORRECTION FOR STANDARD MOISTURE REGAIN.—When it is desired to test tension specimens for tensile strength, in the natural state in which they are cut from the roll or piece, the following method shall be employed to reduce the tensile strength found to the common basis of an assumed standard moisture regain equal to 6.5 per cent of the bone-dry weight:

(*a*) After preparing the specimens for the testing machine, those cut from the warp and those from the filling shall be weighed each in a separate batch under the natural moisture conditions which obtain at the time in the testing room.

(*b*) The specimens shall then be tested immediately, in as rapid succession as possible, by the method specified in Table II.

(*c*) After rupture the broken specimens (entire) shall be placed in the basket of an oven and dried as defined in Section 2.

[3]For tire fabric used for carcass building the number of threads per inch shall be determined by counting a space of 10 inches in at least five different places in the roll or piece, and the average of the five determinations shall be the count.

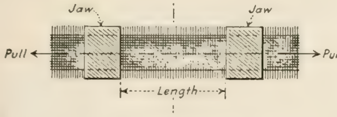


FIG. 1.—Illustration of Strip Test.

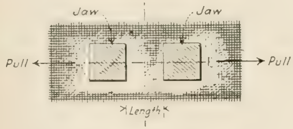


FIG. 2.—Illustration of Grab Test.

(*d*) The total warp and filling specimens shall be grouped each by themselves, forming two batches. The aggregate dry weight of the warp and filling specimens shall thus be obtained and the moisture regain at the time of the test determined.

(*e*) The following formula shall then be applied, based upon the assumption that the standard moisture regain of manufactured cotton is 6.5 per cent of the dry weight, that the actual percentage regain is between the limits of 3 and 6.5 per cent of the dry weight, and that for 1 per cent of moisture regain there is an increase of 6 per cent in the tensile strength of the fabric.

$$\text{Tensile strength corrected to standard moisture regain} = \frac{(\text{Tensile strength from machine reading}) \times 139}{100 + (6 \times \text{Actual Percentage Regain})}$$

Example. A specimen of fabric broken under natural conditions gave a tensile strength of 294 pounds as read from the machine dial. By weighing before and after drying the specimen was found to contain a moisture regain equal to 3 per cent of the bone-dry weight. The tensile strength corrected to a common basis of 6.5 per cent moisture regain would therefore be

$$\text{Tensile strength corrected} = \frac{294 \times 139}{100 + (6 \times 3)} = 346 \text{ pounds.}$$

STANDARD SIZES FOR CHECKS AND INVOICES.

The Standardization Committee of the Purchasing Agents' Association has evolved several aids for both seller and purchasing agent or accounting officer.

The committee considered as the standard check size, 3½ by 8½ inches, which has already been adopted by over 100,000 business houses, with Federal Reserve Board Approval. The fact that most of these business concerns use a voucher check just double the size of the standardized check, and file the original invoice with a copy of the voucher, led to the selection of 8½ by 7 inches as the master size for the standardized invoice.

On account of filing devices, any other sizes selected should be such that they readily fold to 8½ by 7 inches, so 8½ by 7, 8½ by 11, and 8½ by 14 inches were the sizes preferred. It was decided to allow the printing to run either way of the sheet, to suit the sales organization.

G. H. Money of the Federal Rubber Co., Cudahy, Wisconsin, is one of the members of the Standardization Committee.

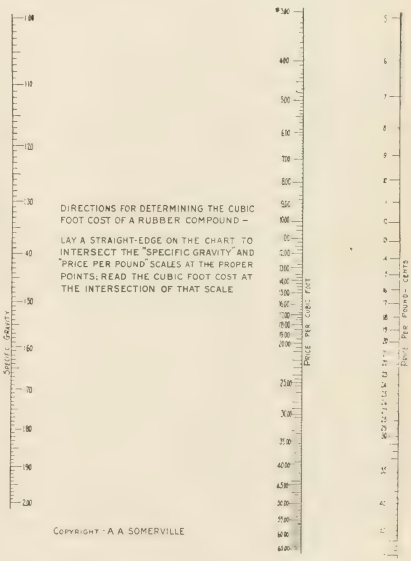
DETERMINATION OF SULPHUR IN VULCANIZED RUBBER.[1]

P. Dekker has subjected to accurate investigation some methods for determining free sulphur (in the acetone extract) and of the combined (and total) sulphur, described in recent literature. As a result of this study the following method has been adopted by the Netherland Government Institute at Delft for the determination of combined and total sulphur:

One gram of the sample is gently heated in an Erlemeyer flask of 200 to 300 cc. with 40 cc. nitric acid (specific gravity 1.4) and 6 grams of magnesium nitrate free of water till the liquid begins to foam, when the flame is removed. In case the foaming is so strong that there is danger of overflowing, the flask is cooled for a moment. As soon as the foaming has ceased it is gently boiled for one hour, then one to two drops of bromine are added and boiling continued for one-half hour. The liquid is then placed in a porcelain dish and evaporated nearly to dryness, 10 cc. strong hydrochloric acid is added and further evaporated till the residue becomes solid on removing the still liquid mass from the water bath. The residue is then dissolved in warm water, filtered, and sulphuric acid determined in the usual manner.[2]

CHART FOR DETERMINING THE COST PER CUBIC FOOT OF RUBBER MIXINGS.

A simple and direct method of determining the cubic foot cost of a rubber compound is here reproduced. The chart was designed and copyrighted by Dr. A. A. Somerville of the R. T. Vanderbilt Co. for free distribution to rubber chemists and compound men. It is of the well known "alignment" type, consisting of three mathematical scales covering a complete range of practical compounding possibilities, namely, a specific gravity scale from 1.00 to 2.00; a cost per pound scale from 5 to 50 cents, and a cubic foot scale covering all resultant combinations of the other two scales.



BUY WAR SAVING STAMPS—BUILD FOR AMERICAN PROSPERITY and your own success.

[1] "Communications of the Netherland Government Institute for Advising the Rubber Trade and the Rubber Industry," Delft, Holland.

[2] Should insoluble sulphates remain behind on the filter, they are fused with potassium-sodium-carbonate.

JUDICIAL DECISIONS.

GOOD WEAR TIRE & TUBE CO. ENJOINED.

Federal Trade Commission *vs.* Sophie Cohn, Samuel M. Chazanoff and B. Counselbaum, doing business under the firm name and style of The Good Wear Tire & Tube Co.

The respondents formed a copartnership in March, 1920, under the name The Good Wear Tire & Tube Co., with their principal place of business in Chicago, Illinois, and engaged in manufacturing and selling reconstructed tires, buying second-hand and unserviceable tires, cementing and sewing them together, and advertising them as "Double Tires" with no hint of their composition, leading the public to believe they were made of new and unused material. Moreover, they had full knowledge of the existence and character of The Goodyear Tire & Rubber Co. and of the confusion the name they had taken would cause.

They are forbidden to use the name "Double Tread" for the tires they make, unless they add words which will show unmistakably that the tires are not made of new and unused material. They are also forbidden to use in interstate commerce the name, The Good Wear Tire & Tube Co. or any other name that resembles that of The Goodyear Tire & Rubber Co. (Federal Trade Commission, Docket 403, Washington, D. C., January 29, 1920.)

ACCEPTANCE TELEGRAM BINDS RUBBER CONTRACT.

Fred Stern & Co. *vs.* The B. K. Sturgis Co.—United States District Court, Ninth District, San Francisco, May 25, 1920.

Damages claimed on account of failure to accept delivery of rubber shipments made during 1918. Acceptance was by telegram, with statement that contract would follow. Judge Rudkin held that the telegram was a binding contract, even though the words were embodied in the telegram that a contract was to be mailed; and that all the jury had to do was to fix the amount of the plaintiff's damages. Through a mistake the jury scattered and the case had to go on the next Court calendar.

CHARGES MISUSE OF NAME.

The McElrath Tire & Rubber Co., Ravenna, Ohio, has been granted a temporary injunction by Judge A. S. Cole, under $5,000 bond, against The McElrath Building Co., of the same town. It charged that the use of the name "McElrath" by the defendant company was an artifice intended to defraud both the plaintiff company and the public, there being no person of that name connected with the defendant company.

TUFFORD HEEL PATENT AGAIN SUSTAINED.

In an opinion handed down last month by United States District Judge Arthur L. Brown, the I. T. S. Rubber Co., of Elyria, Ohio, is sustained in its infringement suit against the United Lace & Braid Manufacturing Co., of Rhode Island. The action was brought in the Federal Court of Rhode Island some months ago. The plaintiff alleged that the defendant was infringing on its reissued latters patent No. 14,049 of January 11, 1916, in the manufacture of rubber heels. Judge Brown in his opinion declared: "I am of the opinion that claims five, six, and seven of the Tufford patent in suit are valid and infringed, and a draft decree may be presented accordingly."

CUSTOMS APPRAISER'S DECISIONS.

No. 43,624. Protest 851,889 of William Wrigley, Jr., Co. Chicago.) Chicle.—Held that dessicated chicle is properly classified as refined, and held dutiable at 20 cents a pound. (Treasury Decisions, Vol 38, No. 12, March 18, 1920.)

No. 43,670. Protest 851,879 of G. W. Sheldon & Co. (Chicago.) Chicle.—Dessicated or dried chicle is properly classified as refined, and dutiable at 20 cents a pound, not at 15 cents a pound as crude chicle. (Treasury Decisions. Vol. 38, No. 15, April 22, 1920.)

No. 43,694. Protest 933,528 of G. Amsinck & Co. (New York.) Gum Chicle by similitude (on authority of Treasury Decision 38,382) is declared not dutiable at 20 cents a pound, but dutiable at 10 per cent ad valorem. (Treasury Decisions. Vol. 38, No. 17, May 6, 1920.)

No. 43,690. Protest 932,747 of The Rubber Association of America. Gum Cauchillo, invoiced as balata and classified by similitude at 15 cents a pound, is held properly dutiable at 10 per cent ad valorem. Treasury Decisions. Vol. 38, No. 17, May 6, 1920.)

No. 43,769. Protest 933,383 of Clauss Portenoy Co., New York. Crude Chicle.—Chicle gathered as sap and subjected to no other process than boiling, to bring about coagulation, and sun-dried. Held to be crude and dutiable at 15 cents per pound. (Treasury Decisions, Vol. 38, No. 23, June 17, 1920.)

No. 38,382. Protest 931,382 of Rubber Association of America et al. against assessment of duty by the collector of customs at New York; reversed in part. Board of United States General Appraisers.

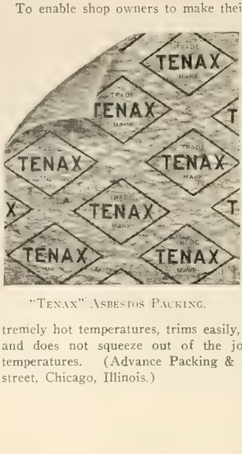
Gum.—Certain gums invoiced as: crude gum chicle, chicle, Colombia gum, cauchillo, sande, gum colombiana, goma tousle, crude chicle, goma sande, colombiana, and goma chicle, were assessed at 15 cents a pound, as if they were chicle, under the similitude clause of paragraph 386 of the Tariff Act of 1913. Held that they are not similar in material, quality, or texture to the chicle provided for in paragraph 36, and should be classified as non-enumerated unmanufactured articles. (Treasury Decisions. Vol. 38, No. 16, April 29, 1920.)

Cauchillo Gums.—The Assistant Secretary of the Treasury on May 12, 1920, called upon the Assistant Attorney General to appeal to the United States Court of Customs Appeals against the decision in No. 38,382. (Treasury Decisions. Vol. 38, No. 19, May 27, 1920.)

United States *vs.* American Chicle Co. (No. 2,014).—United States Court of Customs Appeals, March 24, 1920. Decision of Board of United States General Appraisers (No. 38,152) affirmed. Crude Chicle.—Chicle conveyed to Canada from Mexico and there reduced to small particles and repacked, has not been advanced in quality or value; it therefore pays only 15 cents a pound duty. (Treasury Decisions. Vol. 38, No. 14, April 15, 1920.)

"TENAX" ASBESTOS SHEET PACKING.

To enable shop owners to make their own gaskets, one manufacturer has provided asbestos packing pressed in sheets 50 by 50 inches, ranging in thickness from 1/32 to ⅛-inch, besides one special 1/64-inch sheet which is black graphited. The standard color is blue and is known as "the original blue sheet." "Tenax" compressed asbestos sheet packing is intended for use on the engines of automobiles, gas engines, trucks, tractors, etc. It is claimed for it that it will resist extremely hot temperatures, trims easily, requires no following up, and does not squeeze out of the joint or "fry" under high temperatures. (Advance Packing & Supply Co., 78 East Lake street, Chicago, Illinois.)

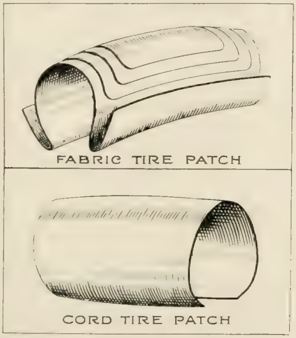


"Tenax" Asbestos Packing.

The Manufacture of Blow-Out Patches.

By Arthur C. Squires.

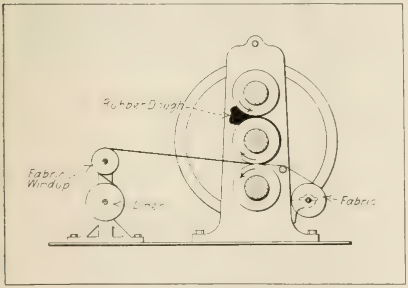
BLOW-OUT PATCHES are emergency accessories that are always carried in the repair kit of every cautious motorist who anticipates the time, that usually comes unexpectedly, when the need is urgent. They are intended for an emergency repair and a protection to the inner tube in case of a blow-out or fabric break, and may be easily and quickly applied on the road.



FABRIC TIRE PATCH

CORD TIRE PATCH

Blow-out patches are made by tire and other rubber manufacturers specializing in tire sundries. There are two types of inside blow-out patches, the fabric and the cord. The former is intended for fabric tires and is provided with flaps that extend outwardly between the beads and the rim, thereby holding the patch firmly in place. The cord patch is designed for cord tires, although it may be used in a fabric tire repair. The cost of this patch, however, does not warrant such use, as a fabric casing break tends to increase, and therefore should be properly repaired and vulcanized. An injury to a cord casing does not have a tendency to grow larger, hence the cord patch can be applied with cold patching cement and may wear as long as the tire. However, a vulcanized repair is undoubtedly more permanent.



CALENDERING THE FABRIC.

While the process of making inside blow-out patches varies somewhat among manufacturers, fabric patches are usually built up from four superposed plies of bias frictioned fabric of equal width, each ply being stepped down longitudinally. The cord patch is built up from bias cord fabric in the same way and the edges of both types are tapered to a fine edge.

The manufacture of blow-out patches includes the wrapped and molded processes, the former being the most commonly used, method and is briefly described as follows: A roll of 13-ounce cotton duck, 36 inches wide and about 50 yards in length, is thoroughly dried to free it from moisture. A length of pipe is passed through the center of the roll, which is then placed horizontally in bearings, and the free end of the fabric is passed between the middle and lower roll of the calender and fastened to the stock shell. Previously, the rubber stock is compounded and mixed on a two-roll mill. The formula commonly used consists of:

Smoked sheet	22	pounds
Whiting	12	pounds
Litharge	3	pounds
Sulphur	1½	pounds

CALENDERING.

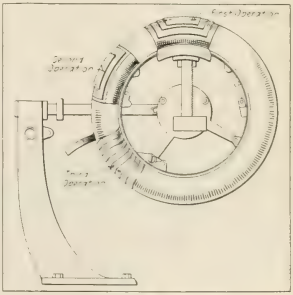
The calendering is done on a three-roll calender. After the rubber dough has been warmed up on a special warming mill, it is placed between the upper and middle rolls of the calender, and when the calender is started and adjusted, the rubber passes in a thin sheet on the middle roll which is somewhat hotter than the top roll. This sheet is transferred by pressure of the rolls to the fabric that passed between the middle and lower rolls and the frictioned-fabric is then wound up on the stock shell with a cotton liner between the rubber surfaces to prevent their sticking together. The speed of the bottom roll is somewhat slower than the other two for the purpose of forcing or frictioning the rubber through the interstices of the fabric.

CUTTING.

The roll of calendered fabric is then mounted at one end of the cutting table and a length of stock is unrolled and laid on the table, meanwhile, the liner is stripped off and wound up for further use. The stock is then cut on the bias according to the sizes required.

ASSEMBLING.

The next operation is assembling or building up the patches. This is done on a hollow metal core that conforms in section to the shape of the tire casing in which the patch is intended to be used. A coating of cement is first applied to the core that is mounted on any ordinary tire building stand. The next step consists in applying the largest ply of fabric to the core, allowing the rim-flaps to extend downward and over-hang the inside periphery of the core. This first-ply is given a coating of cement and the second ply is laid on the first, and so on until the four-ply patch is assembled. Each ply, however, should be rolled down smoothly and all air pockets between the plies carefully removed. As many patches as the circumference



BUILDING OPERATIONS.

of the core will accommodate are built up in this way, when the flaps are dusted with soapstone and turned back against the body of the patch and the cloth wrapping applied.

VULCANIZING.

The assembled, cloth-wrapped patches are now ready for vulcanizing or curing, as it is commonly called. This is done in a horizontal, open steam vulcanizer. The cores, with their assembled and cloth-wrapped patches, are hung on stationary metal rims within the vulcanizer and about 38 pounds of steam pressure applied for 38 minutes.

After the cloth wrapping is unwound the patches are stripped from the core and dusted with soapstone, when they are ready to be marked and packed.

ZWEBELL'S HINTS TO REPAIRMEN.

THE NON-SKID IMPRESSION PAD.

The impression pad is used for retaining the non-skid pattern on tires or for reproducing it on tread sections, etc. When the non-skid pattern is being replaced, soapstone can be used to fill with and good work obtained. However, there is no pressure obtained by the use of soapstone, and for this reason the impression pad is found to be the best.

(1.) Pads are made to fit the molds, and are usually the length of the mold.

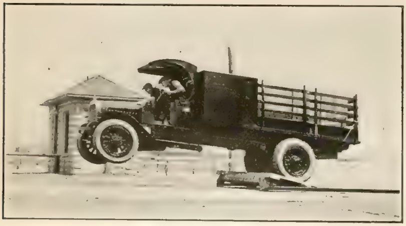
(2.) When applying the pad on the tire, place it beyond the point of injury, and where the non-skid design is in first-class condition. The pad can be tied on so it will adhere and not slip.

(3.) When making an impression pad, make it right. Take a ply of reclaimed fabric of the proper length and width. Buff and cement the fabric and place on this two layers of 1/16-inch tread gum, or more, if the non-skid is deep, and then cure. The result is a strong non-chipable pad that will last for seventy-five cures or more without losing the impression.

(4.) Impression pads are inexpensive and better when reclaimed fabric is used. Scrap, waste or dirty gum is used between the fabric and the last ply of gum coming in contact with the tire.

PNEUMATIC TRUCK TIRES WITHSTAND SEVERE TESTS.

W. V. Logan of the United States Tire Co., in a paper read before the metropolitan section of the Society of Automotive Engineers in New York, May 12, 1920, on the development of the pneumatic truck tire, told of some interesting experiments that have been made. The story of the working out of the idea of applying pneumatic tires to heavy trucks since it was first formed in 1909, with the enumeration of the advantages to be gained,



The Jumping Test.

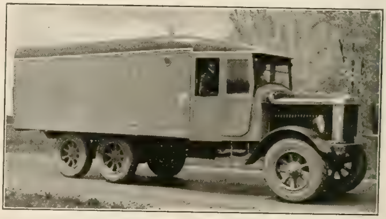
formed the main portion of the address. At the close, Mr. Logan showed in moving pictures exactly what takes place in a solid or a pneumatic truck tire when subjected to excessive shocks and strains. The tests were made at the truck tire factory of the United States Rubber Co.

All the trucks, except the 5-ton truck in the gutter jump, were loaded beyond their rated capacity; the speed was between 17 and 20 miles an hour. The platform from which they jumped was 1½ feet high. The deflection of the tires as they struck the ground was 50 per cent of their cross-section diameter.

The jumping truck weighted 10,800 pounds loaded, and the tires used were six-inch in front and eight-inch in rear. The same truck took gutter and curbstone tests as well as the jump tests. In eight jumps there was not a blow-out nor tire trouble of any kind, and after the tests the four tires were taken off and dissected but not a break nor a scratch was found on the inside of the casings. Moreover, after eight or nine jumps had been made, all on the same identical spot, absolutely no harm was done to the concrete road. It was found that the impact of the pneumatic tired truck on the surface was two-thirds less than the impact of a solid tired truck.

DEVELOPMENT OF THE SIX-WHEEL TRUCK.

P. W. Litchfield, vice-president and factory manager of The Goodyear Tire & Rubber Co., expressed his views on tires and their future at the dinner given by the company to the Cleveland and Detroit sections of the Society of Automotive Engineers at Akron, Ohio, in May last. After an interesting review of the history of transportation, in which he showed how street-cars must give way to motor buses, and prophesied



Instead of Two Giant Pneumatic Tires, Each Weighing 398 Pounds, the Tandem Axle Construction Permits the Use of Four 40 by 8 Pneumatic Tires, Each Weighing Only 119½ Pounds.

the disappearance of railroads, he turned to the question of truck tires. He believes that the pneumatic-tired truck and the long-distance truck can handle in the future the passenger and freight business, now managed entirely by the railroads. Larger loads and longer distances make possible an enormous increase in the volume of the motor truck business, but the use of the truck is very limited if solid tires are used, as greater speed and carrying capacity are obtained with pneumatic tires. Larger units must be employed; 3-ton and 5-ton trucks have been used and the tires for 3-ton sizes are being rapidly changed to pneumatic equipment. Largely as an experiment the Akron-to-Boston express was started, and it proved an excellent tire-testing experiment. It was learned that while it is not difficult to make 12, possibly 15 and perhaps 20-inch tires, it is questionable whether they are the tires for this service. When considering 10 and 12-ton trucks it was found that the truck body and center of gravity were too high. The remedy was to use multiple wheels, that is, more than four, say six; four wheels have proved inefficient on European railroad cars as compared with American freight cars, and that holds good for motor trucks also. The truck should be on tandem wheels and not on twin tires on the same wheel and the riding quality and carrying conditions will be better. By putting the extra wheels under the rear end of the truck body the damage to tires is avoided, which follows with large single tires, because tires are distorted with a big body overhang, and more traction is obtained with a four-wheel drive.

War Department Specifications for Mechanical Rubber Goods—II.

War Department Specifications No. 333-1-1, referred to in the following, were published in The India Rubber World, January 1, 1920:

COTTON RUBBER-LINED FIRE HOSE.

War Department Specification No. 333-1-7—June 5, 1919.

General.—(*a*) This specification covers the requirements for cotton rubber-lined fire hose.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[1], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

Construction.—See General Specifications and following table.

(*a*) Shall be made of single or double jacketed cotton cover as may be directed and a rubber lining.

(*b*) The cotton cover shall be circular woven, seamless, or one ply or two separate plies as may be specified. Free from foreign matter and imperfections. The filling shall be a high ply yarn and the warp a lower ply yarn.

(*c*) The rubber lining shall be uniform throughout, consisting of not less than three calendered sheets lapped at the seam into one solid body, properly vulcanized. It shall be as free from corrugations as is consistent with good practice and not less than 0.058-inch in thickness for 2½-inch hose and not less than 0.049-inch for 1½-inch throughout, exclusive of backing.

(*d*) Fittings.—Each length of hose shall be properly fitted into brass couplings of the following composition:

	Per Cent.
Copper, not less than	83
Tin, not less than	5
Zinc, not more than	7
Lead, not more than	3

Note.—0.5 per cent charcoal iron may be used if desired.

All surfaces shall be machine finished except the corrugations in the tail parts. The thickness of metal shall not be less than 5/32-inch at any one point. The diameter of the waterway shall be as near 2½ inches as possible and not less than 2¼ inches, being determined by keeping the thickness of metal between the bottom of thread and surface of the waterway not less than 5/32-inch. Each 2½-inch coupling shall be provided with two expansion rings, which shall have smooth, rounded edges and shall be not less than 0.050 and not over 0.058-inch in thickness; not less than 1½ inches in length and at least ⅛-inch shorter than the tailpiece. Each 1½-inch coupling shall be provided with two expansion rings of suitable size to guarantee satisfactory performance. Two spanner lugs shall be provided 9/16-inch in diameter and 9/16-inch in length for 2½-inch hose and ½-inch in diameter and 7/16-inch in length for 1½-inch hose, both on the swivel and the male end, and shall conform to dimensions, marked with manufacturer's name, month and year of manufacture, and the words "U. S. A."

(*e*) Threads.—Shall be standard iron-pipe size for 1½-inch hose and "National Standard" fire-hose thread for 2½-inch size unless otherwise specified in the proposal or order.

(*f*) Gaskets.—Three shall be provided with each coupling, one in the swivel and one in each end underneath expansion rings; all exactly fitted, 3/16-inch in thickness, and of the same composition as the rubber tube.

Branding.—See General Specifications.

(*a*) Stenciled in black with indelible ink, letters at least 1 inch high in two places on each length 2 feet from the couplings, with the words "U. S. A. FIRE," manufacturer's name, and date.

Material.—See General Specifications.

(*a*) Lining and washers shall contain not less than 35 per cent of fine Pará, nor more than 4 per cent sulphur, with the remainder suitable dry inorganic mineral fillers. The uses of reclaimed rubber or rubber substitutes will not be permitted.

Inspection.—See General Specifications.

(*a*) From each shipment of 20 lengths or less the inspector may select one length at random, and cut from it a 1-foot section for tests.

Tests.—See General Specifications and following table.

(*a*) Each length of hose with couplings attached shall be subjected to pressure test. Twist shall be in a direction to tighten the coupling. Hose shall not leak, sweat, nor rupture the threads of the cotton cover.

(*b*) For physical tests an 8-inch section shall be cut from sample after burst.

(*c*) Friction test to be conducted on a specimen 1½ inches long.

(*d*) Samples after being subjected to a dry heat of 158 degrees F., plus or minus 2 degrees, for 96 hours must have a tensile strength of at least 900 pounds per square inch.

(*e*) Chemical test shall be made on the tube properly separated from the cover, buffed free of backing and properly prepared. The acetone, alcoholic potash, and chloroform extract, ash, and total sulphur together shall not exceed 67 per cent by weight of the total compound. Free sulphur must not exceed 1.25 per cent by weight of the total compound. The acetone extract shall not exceed 4 per cent. The alcoholic potash shall not exceed 1.5 per cent. The chloroform extract must not exceed 2 per cent. The total sulphur, exclusive of barytes, must not exceed 4 per cent, and the ash shall not be greater than 57 nor less than 50 per cent by weight of the total compound.

(*f*) Elongation and twist measurements shall start with hose filled with water at 10 pounds' pressure.

(*g*) One length from every 10 shall be given the kinking test, which shall be conducted by kinking the hose 18 inches from one end by tying the coupling back against the hose.

(*h*) A 3-foot section shall be cut from at least one length in every sixty 50-foot lengths for bursting test.

Table.

	Size, Inches.		
	1½	2½	2½
Number of jackets	Single.	Single.	Double.
Tolerance I. D., plus or minus ... inches	1/32	3/64	3/64
Length in feet	50	50	50
Weight per length including couplings:			
Minimum ... lbs.	21	40	..
Maximum ... lbs.	..	..	70
Hydrostatic tests:			
Testing pressure,[2] every length, minimum . lbs.	300	300	400
Rise from table,[2] maximum ... inches	7	4	None.
Elongation,[2] maximum ... per cent	13	13	9
Distortion from straight line,[2] maximum, inches	20	20	20
Twist, degrees per foot,[2] maximum	50.4	25	15
Kinking test, minimum ... lbs.	300	300	350
Burst test (3-foot sample lying straight, or curved to 27-inch radius), minimum . . lbs.	500	500	600
Friction, minimum ... lbs.	12	12	12
Tensile:			
Before aging, minimum ... lbs.	1,600	1,600	1,600
After aging, minimum ... lbs.	900	900	900
Ultimate elongation, minimum ... inches	2-12	2-12	2-12
Permanent set:			
Stretch 10 minutes, then release, minimum ... inches	2-10	2-10	2-10
Per cent set after 10 minutes' rest, maximum	25	25	25

GASOLINE HOSE.

War Department Specification No. 333-1-8—June 5. 1919.

General.—(*a*) This specification covers the requirements for hose to be used in conveying gasoline.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[1], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

Construction.—See General Specifications and following Table II.

(*a*) Tube when made from rubber sheet shall consist of at least two complete turns, reinforced at lap into one solid body.

(*b*) Hose to be made of braided or fabric plies.

(*c*) Washers to be made of leather 1/16-inch in thickness.

Branding.—See General Specifications.

(*a*) Use the word "Gasoline."

Material.—See General Specifications and following Tables I and II.

(*a*) Tube, cover and friction, shall contain not less than 25 per cent of fine Pará, and not more than 1 per cent free sulphur.

Inspection.—See General Specifications.

(*a*) Inspector may cut at random a three-foot section for each shipment of 1,000 feet or less.

Tests.—See General Specifications and following Table II.

(*a*) A length of hose with couplings attached after having been filled with gasoline for two hours shall withstand a pressure test as in Table II.

[1]See "The India Rubber World," January 1, 1920, page 214.
[2]Tests shall be conducted on each length.

(*b*) Flexibility.—By flexibility is meant ability to bend without kinking. When hose of internal diameter (Y) is bent around a cylinder having diameter equal to (X) times the external diameter of hose as in the following table, the external diameter of hose shall not increase or diminish by more than 10 per cent.

Table I.

Internal diameter.	Less than ½ to 1½-inch to above—			
(Y) .... inches	½	¾	1½	1⅛
(X)	8	12	14	16

(*c*) Dry Heat.—A 3-inch piece of hose shall be subjected to dry heat at 132 degrees C. for two hours, and after cooling it shall not be tacky nor show any tendency to crack.

(*d*) Permeability.—(The specific gravity of the gasoline used in this test should be between 0.710 and 0.725 at 15.5 degrees C.; 65 per cent of it must distill over at 100 degrees C. from a distillation flask when the bulb of the thermometer is just below the side tube.) A 14-inch length of the hose is held vertically and plugged at the bottom.

The upper end is fitted with a glass tube about 18 inches long. The hose so arranged is filled with gasoline to a head of 12 inches above the top of the acting length of the hose. The acting length of the rubber hose is 12 inches. The upper end of the glass tube is loosely closed with a cork.

During the first 24 hours the level of the gasoline will fall comparatively rapidly. The loss of gasoline is made good by frequent additions from a known volume of gasoline, care being taken that the level of the gasoline in the glass tube does not fall at any time by more than 3 inches. This test is to last for 72 hours, and the loss of gasoline during the third 24 hours shall not exceed 100 c. c. per square foot of the original internal surface of the hose.

(*e*) Immersion in Gasoline—A 3-inch piece in the hose is boiled for one hour (using a reflux condenser) in gasoline similar to that used for the permeability test. The gasoline is allowed to cool down. Twenty-four hours later the test piece is removed from the gasoline and examined without delay, as follows:

The internal diameter at the point of greatest constriction is measured by means of rod gages. From this measurement the area of the bore is calculated. It shall not differ from the original by more than 25 per cent.

The test piece is then cut longitudinally into halves, and the adhesion between rubber and cotton carefully examined. The adhesion shall be of such a character that the rubber can only be stripped from the cotton by hand with difficulty.

(*f*) Immersion in Oil.—A 3-inch piece of the hose is immersed in medium gas-engine cylinder oil at a temperature of 100 degrees C. for 8 hours, and for a further period of 24 hours at ordinary temperature. The oil is then wiped from the surface of the hose. The decrease of internal diameter shall be less than 10 per cent.

The flexibility and elasticity of the rubber shall not be diminished and there shall be no tendency of the rubber to separate from the cotton.

Table II.

Size.	Up to ½ Inch Inclusive.	Over ½ to ⅝ Inch, Inclusive.	Over ⅝ to 1 Inch, Inclusive.	Over 1 to 1½ Inches, Inclusive.	Over 1½ to 2 Inches, Inclusive.	Over 2 Inches.
Tolerance, plus or minus..inch	1/16	1/16	1/16	1/16	1/16	1/16
Thickness:						
Tube, minimum ....inch	1/16	1/16	1/16	1/16	1/16	1/16
Cover, minimum....inch	3/64	3/64	3/64	3/64	3/64	3/64
Fabric, plies, minimum......	2	2	3	3	4	4
Hydrostatic burst after gasoline immersion minimum.lbs.	160	140	140	120	100	80

PNEUMATIC HOSE.

War Department Specification No. 333-1-10—June 5, 1919.

(A) ROCK-DRILL HOSE. (B) PNEUMATIC-TOOL HOSE.

General.—(*a*) This specification covers the requirements for pneumatic-tool and rock-drill hose for conveying air under pressure.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[1], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the words and meaning of this specification will govern.

Construction.—See General Specifications.

(*a*) Dimensions: See the following table.

(*b*) The fabric plies of pneumatic tool hose shall be of sheeting or a plain weave fabric.

(*c*) The fabric plies of rock-drill hose shall be of duck.

Branding.—See General Specifications.

(*a*) Use word "Pneumatic" on pneumatic hose.

(*b*) Use words "Rock Drill" on rock drill hose.

Material.—See General Specifications.

Inspection.—See General Specifications.

Tests.—See General Specifications and following table.

(*a*) When test pieces are stretched 2 to 9 inches at the rate of 20 inches per minute, the stress upon the tube shall be at least 900 pounds, that upon the cover at least 700 pounds per square inch.

Table I.

	Pneumatic. Size, Inches.		Rock Drill. Size, Inches.	
Outside diameter..............inches	1	1 5/16	1 7/16	1¾
Tolerances:				
I. D., plus or minus..........inch	1/64	1/64	1/64	1/64
O. D., plus or minus..........inch	1/32	1/32	1/32	1/32
Thickness:				
Tube, minimum................inch	3/32	3/32	3/32	3/32
Cover, minimum...............inch	3/32	3/32	3/32	3/32
Fabric, plies, minimum...............	5	7	4	5
Hydrostatic:				
Coupling test, minimum........lbs.	250	250	250	250
Burst test, minimum............lbs.	600	600	600	600
Friction, minimum. ....lbs.	12	12	20	20
Tensile:				
Tube, minimum.................lbs.	1,500	1,500	1,500	1,500
Cover, minimum................lbs.	1,300	1,300	1,300	1,300
Ultimate elongation:				
Tube and cover, minimum....inches	2-11	2-11	2-11	2-11
Permanent set:				
Tube and cover, stretch for 10 minutes, then increase minimum.inches	2- 9	2- 9	2- 9	2- 9
Per cent set after 10 minutes' rest, maximum	25	25	25	25

SUCTION HOSE.

War Department Specification No. 333-1-12—June 5, 1919.

General.—(*a*) This specification covers the requirements for hose used for the removal of water by means of suction pumps.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[1], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

Construction.—See General Specifications.

(*a*) Dimensions: See table following.

(*b*) Smooth bore.—Shall be made with an inner rubber tube, a helix of wire with rubber filling between the spirals; a second layer of rubber; cotton canvas layers; and an outer rubber cover.

Rough bore.—Shall be made with an inner helix of wire covered with a layer of cotton canvas; the spaces between the wire filled with rubber in such a way that the cotton canvas is worked inward, making the passage through the hose as smooth as possible; a layer of rubber; cotton canvas layers; and an outer rubber cover.

(*c*) Suction strainers shall be furnished only when specifically called for in the proposal.

(*d*) The ends of each length shall be capped with the same rubber compound as used in the tube.

(*e*) The rough bore helix shall be of heavily galvanized flat iron wire, with rounded edges; the smooth bore helix shall be of heavily galvanized or copperized flat or round wire; each complying with table. The spacing between the adjacent wires shall be filled with rubber strips of the proper thickness and same quality of rubber compound as used for the tube. The rubber strips shall be of sufficient thickness so that when the hose is made up complete, the outside of the hose shall not show appreciable corrugations. The helix shall end at such a distance from the end of the hose that it will extend over the tailpiece of the coupling about 1 inch when the hose is trimmed and the coupling attached. The end shall be properly secured and the space thus left for the attachment of the coupling shall be filled with well-frictioned cotton canvas layers of the same material as is used in the body of the hose. The fabric placed under the wire at the end of the rough bore hose shall not extend within the hose more than ¾-inch beyond the end of the shank of coupling.

Branding.—See General Specifications.

(*a*) Use word "Suction."

Material.—See General Specifications and following table.

(*a*) Tube, cover, filler, layer, washers and friction shall be properly vulcanized and contain not less than 35 per cent by weight of fine Pará rubber; not more than 3 per cent by weight of sulphur, with the remainder suitable dry inorganic mineral fillers.

Inspection.—See General Specifications.

(*a*) With each lot of 50 lengths or less the contractor shall

[1] See "The India Rubber World," January 1, 1920, page 214.

TABLE.

	Size, Inches.									
	Smooth Bore. 1½	Rough Bore. 1½	Smooth Bore. 2	Rough Bore. 2	Smooth Bore. 2½	Rough Bore. 2½	Smooth Bore. 3	Rough Bore. 3	Smooth Bore. 4	Rough Bore. 4
Outside diameter, plus or minus ..... } Soft ends { ..... inches	2 7/16	2 3/16	2 13/16	2 11/16	3 9/16	3 5/16	4	3 7/8	5 1/16	4 13/16
Tolerance (I. D.) ..... } Soft ends { ..... inches	1/64	1/64	1/64	1/64	1/64	1/64	1/64	1/64	1/64	1/64
Tolerance (O. D.) plus or minus ..... inches	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16
Length, as specified in proposal.										
Thickness:										
Tube, minimum ..... inches	1/16	....	1/16	....	1/16	...	1/16	....	1/16	....
Cover, minimum ..... inches	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16
Rubber layer, minimum ..... inches	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16
Rubber filler, minimum ..... inches	1/8	1/16	1/8	1/16	5/32	1/8	1/8	1/8	1/8	1/8
Washers, minimum ..... inches	1/8	1/8	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Wire, size, minimum ..... inches	0.120	1/4x1/16	0.120	1/4x1/16	0.148	1/4x1/8	3/8x1/8	3/8x1/8	1/2x1/8	1/2x1/8
Spacing, maximum ..... inches	1/2	1/2	1/2	1/2	5/8	5/8	3/4	3/4	1	1
Fabric, plies, minimum	4	4	4	4	4	4	4	4	5	5
Weight per square yard, minimum ..... ounces	14.4	14.4	14.4	14.4	14.4	14.4	18.0	18.0	18.0	18.0
Hydrostatic coupling, test pressure, minimum ... lbs.	125	125	125	125	125	125	125	125	125	125
Friction, minimum ..... lbs.	15	15	15	15	15	15	15	15	15	15
Tensile:										
Tube, minimum ..... lbs.	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Cover, minimum ..... lbs.	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
After accelerated aging:										
Tube, minimum ..... lbs.	900	900	900	900	900	900	900	900	900	900
Cover, minimum ..... lbs.	800	800	800	800	800	800	800	800	800	800
Ultimate elongation:										
Tube and cover, minimum ..... inches	2-11	2-11	2-11	2-11	2-11	2-11	2-11	2-11	2-11	2-11
Permanent set:										
Set, stretch for 10 minutes, then release, minimum ..... inches	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10
Per cent set after 10 minutes' rest, maximum	25	25	25	25	25	25	25	25	25	25

[1]See "THE INDIA RUBBER WORLD," January 1, 1920, page 214.

furnish a section of hose 12 inches long, which he shall guarantee to be made of the same material and the same construction (without wire), as the hose delivered.

TESTS.—See General Specifications and above table.

(*a*) Test pieces of tube and cover shall be subjected to an accelerated aging test of 96 hours in dry heat at 158 degrees, plus or minus 2 degrees F.

WATER HOSE.

War Department Specification No. 333-1-14—June 5, 1919.

GENERAL.—(*a*) This specification covers the requirements for hose to be used in conveying cold water.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[1], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(*a*) Dimensions to conform with the following table.

BRANDING.—See General Specifications.

(*a*) Use the word "Water."

MATERIAL.—See General Specifications.

(*a*) Tube, cover, washer, and friction shall contain not less than 35 per cent fine Pará rubber, not more than 3 per cent of sulphur; the remainder shall consist of suitable dry inorganic mineral fillers.

INSPECTION.—See General Specifications.

TESTS.—See General Specifications and following table.

(*a*) Test pieces of tube and cover shall be subjected to an accelerated aging test of 96 hours in dry heat at 158 degrees F., plus or minus 2 degrees.

TABLE I.

	Size.				
	¾-Inch.	1 Inch.	1½ Inches.	2 Inches.	3 Inches.
Tolerance, inside diameter, plus or minus ..... inch	1/64	1/64	1/32	1/32	1/32
Outside diameter ..... inches	1 3/16	1½	2	2 1/16	3¼
Tolerance, plus or minus .. inch	1/32	1/32	3/64	3/64	3/64
Thickness:					
Tube, minimum ..... inch	1/16	1/16	1/16	1/16	3/32
Cover, minimum ..... inch	3/64	3/64	3/64	3/64	1/16
Fabric plies, minimum ..... inches	3	4	4	4	5
Hydrostatic:					
Coupling test, minimum .... lbs.	150	150	150	150	150
Burst test, minimum ..... lbs.	500	500	400	300	225
Friction:					
Cover and plies, minimum .. lbs	13	13	13	13	13
Tubes and plies, minimum .. lbs.	13	13	13	13	13
Adhesion between plies, minimum ..... lbs.	15	15	15	15	15
Tensile:					
Tube, minimum ..... lbs.	1,500	1,500	1,500	1,500	1,500
Cover, minimum ..... lbs.	1,300	1,300	1,300	1,300	1,300
After accelerated aging—					
Tube ..... lbs.	900	900	900	900	900
Cover ..... lbs.	800	800	800	800	800
Ultimate elongation:					
Tube and cover, minimum, inches	2-11	2-11	2-11	2-11	2-11

	Size				
	¾-Inch.	1 Inch	1½ Inches	2 Inches.	3 Inches.
Permanent set, tube and cover:					
Stretch for 10 minutes, then release, minimum ..... inches	2-10	2-10	2-10	2-10	2-10
Set per cent after 10 minutes, maximum	25	25	25	25	25

[1]See "THE INDIA RUBBER WORLD," January 1, 1920, page 214.

GUTTA PERCHA IN THE PHILIPPINES.

The Honorable Dionisio Jakosalem, Secretary of the Department of Commerce and Communications of the Philippines, writing in regard to the exports of gutta percha from the Philippines, states that most of the gutta percha produced in the Philippines is exported through the ports of Jolo and Zamboanga to Singapore, from whence it goes to Europe. The product is thus wrongly credited to the Federated Malay States. His office is now conducting an investigation to find out why that product is not exported directly from Manila to the United States.

He points out that in 1915 the Philippine export of gutta percha amounted to 31,650 kilos, valued at 31,143 pesos, and in 1919 to 38,030 kilos, valued at 36,942 pesos. One thousand kilos equals a ton of 2,200 pounds, a peso equals 50 cents, United States currency. The Secretary believes that the volume of our export to the United States can be considerably increased through the employment of American buyers in the Philippines, with the establishment of a reliable market in the United States where direct shipments may be handled.

A while back, when the laying of another transpacific cable was under discussion, it was alleged that the necessary gutta percha for insulation could not be secured as Great Britain had control of the world's supply.

The supply of gutta percha that can be secured in the Philippines is incalculable. It is classed as a minor forest product and is brought in by members of the non-Christian tribe, who live in the forests, in small quantities when they are in need of funds. No systematic effort has been made to secure a larger supply and the competition among the Chinese traders for that which is produced is not very keen.

The Secretary also points out the existence of extensive areas for the cultivation of rubber plants which are available; and that great opportunities and ample government protection are offered American and foreign capital invested in the islands. (James J. Rafferty, Philippine Commercial Agency, New York City.)

TESTING MACHINES.[1]

A survey of the types of testing machines used in various countries for testing textile materials divides them into two distinct classes: (1) constant increment of load; (2) constant increment of stretch.

The constant-increment-of-load machines apply the load by uniformly increasing the tension in very small increments. There are a few isolated cases in which the load is increased by appreciable amounts at stated intervals of time.

The constant-increment-of-stretch machines apply the load by stretching the material at a uniform rate, and because of their simplicity and rapidity of operation have found much favor with textile men both in this country and abroad.

The progress of testing-machine development in England, particularly during the war, is rather interesting. For a long time the two types of machines were in general use, but the constant-increment-of-stretch machine was the one most used. At the beginning of the war the problem of studying aircraft fabrics was given to the National Physical Laboratory, which has much the same relation to English industry as the Bureau of Standards has to American industry. In the study of such fabrics, it is extremely desirable that a machine be used that will give tests which do not involve machine characteristics. In this connection the Avery testing machine has been developed and the English Government insists that all aeronautical fabrics be tested on that particular machine.

The Avery machine is illustrated in Fig. 1. Its principle is not new, but the mechanical design is quite an improvement upon the Goodhand and Smith machines of this type. It consists briefly of a compound lever, having at one end of the system a shot container so arranged to allow of a uniform rate of inflow and at the other end a fabric clamp. The shot container is allowed to be uniformly increased in weight and the balance beam kept at zero by taking up the stretch of the sample. Provision is made to cut off the supply of shot at the time of breaking of sample. A spring balance interposed between the shot container and balance arm allows the increase of weight of the container to be quickly observed.

It has been observed that within certain limits a change in the rate of loading produces practically no change in the physical properties of the material. The Avery machine is operated in accordance with specifications, within these limits and as a result the rate of loading varies with the kind of material being tested.

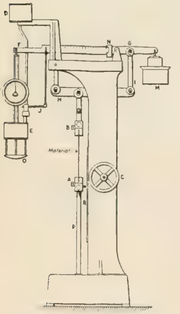


Fig. 1.—Avery Fabric-Testing Machine.

A, Lower Grip; B, Upper Grip; C, Hand Wheel; D, Reservoir; E, Can; F, Steelyard; G, Steelyard Pivot; H, Lever; I, Link; J, Switching Mechanism; L, Spring Balance; M, Checking Can; N, Sliding Poise; O, Receptacle; P, Screw; R, Vertical Scale.

The development and use of this machine show a very careful study and consideration of the tensile properties of the material to be tested. The machine is theoretically very good, but the personal equation and time of operation is so large that its practical utility is questioned.

If the constant-increment-of-stretch machine had no machine characteristics, the results of tests on this type of machine would correspond with those obtained from a constant-increment-of-load machine, provided both were operated between the limits that define the relations of stretch, load and time, within which a change in the rate of load application produces only a slight change in properties.

The constant-increment-of-stretch machines may be classified according to the method of recording the load transmitted by the fabric: (1) inclination balance; (2) elastic system (such as a spring).

The rigidity of construction, ease of operation and so-called "dead weight" feature of the inclination balance type of head—together with the fact that springs were not, in the past, constructed to give constancy of operation—has caused the first type to be used universally in this country and in Germany. This type is illustrated in Fig. 2.

The theory and calibration of an inclination balance machine assumes a null method of weighing, that is, the balance or poise arm is at rest. This condition is entirely changed during the test by the inertia of a moving balance arm. The calibration is, therefore, not applicable to the machine as used. The error may be expressed as a function of the mass of the moving body multiplied by the acceleration. Obviously the acceleration changes with each different kind of material, shape and size of specimen, and speed of operation, and the total inertia component changes with the design and capacity of the machine. This is particularly emphasized in testing the same fabric on machines of different capacities; it is an established fact that results are different. From this it is readily seen that the results of tests of different fabrics on machines of the same capacity are influenced materially by the machine characteristics. All tests made on such machines include machine characteristics which vary with the variables of the test specimen, including nature of material, dimensions of test specimen, and rate of testing.

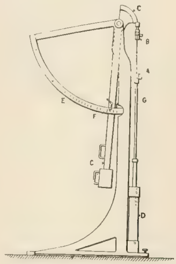


Fig. 2.—Schopper Fabric-Testing Machines, Inclination Balance Type.

A, Lower Grip; B, Upper Grip; C, Inclination Balance; D, Cylinder; E, Ratchet Scale; F, Finger; G, Pawl.

The use of this machine to check up deliveries is quite reasonable, for it is assumed that the machine characteristics are included in the specifications automatically and are constant for any one fabric and any one size and type of testing machine. Specifications based on tests made on this type of machine should specify the size, type and make of machine and rate of operation, as well as the specimen dimensions.

For investigational work, however, such as the comparison of the properties of different fabrics and the determination of the effect of varying the size of sample, it is clear that the results are very misleading if they include machine characteristics. The errors introduced become infinitesimally small as the speed of the moving arm approaches zero as a limit.

The use of an elastic system for recording the load transmitted eliminates the variables introduced by the inclination balance, provided the mechanical design is good, and it has the advantage of rapid and positive operation. Unfortunately, very little attention has been paid to the design of such machines and the variance introduced has caused them to be much in disfavor.

As the situation presents itself, there are two courses open for improvement and standardization of machines for testing textile materials:

[1]American Society for Testing Materials. Report of Sub-Committee III of Committee D-13.

First, the standardization of existing machines, which practically means only one make, one capacity and the same dimensions of the same moving parts; otherwise there will still exist confusion of results caused by the testing of materials on machines having different machine characteristics.

Second, the redesign of the principle of the recording head of the testing machine, so that the results obtained are independent of the machine. The second consideration is practically as easy to effect as the first, and has the advantage of being based on sound mechanics.

It may be asked why the Bureau of Standards has recommended that a particular make and size of inclination balance testing machine be used by the military departments during the present crisis. The military departments, such as the Quartermaster's Department and Signal Corps, were confronted with the problem of checking large deliveries immediately. Under these conditions the Bureau of Standards recommended one size of test specimen, one speed of operation, one make, and one capacity of inclination balance testing machine, regardless of whether any one condition of the test was fundamentally sound. The main object was to obtain uniform test methods at once.

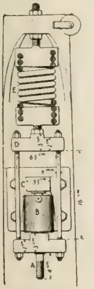


Fig. 3. Head of Fabric-Testing Machine, Bureau of Standards. A, Clamp Here; B, Oil Dash Pot; C, Dash Pot Support; D, Dash Pot Piston Yoke; E, Spring.

For investigational work such as Committee D-13 contemplates, however, the testing machines used should be fundamentally correct.

The requirements of a testing machine are: (1) rigidity; (2) as nearly automatic operation as is possible; (3) recording head free from objectionable characteristics caused by (*a*) principle, (*b*) mechanical design.

The Bureau of Standards has been experimenting with a testing machine which as a whole has no value as a commercial machine, but which has shown itself to be reasonably constant and free from machine characteristics. It is constructed on the constant-increment-of-stretch principle and has a recording head of a suspended spiral spring and oil dash pot to take care of recoil. The head is illustrated in Fig. 3.

From the results obtained with this machine the Bureau is redesigning the present testing machines along these lines, with the addition of a temperature correcting device and an individual test result totalizer. The construction is rigid and simple, and the operation a little quicker and as automatic as that of any existing machines.

PROPOSED TENTATIVE SPECIFICATIONS FOR ADHESIVE INSULATING TAPE.[1]

Issued, 1920.

1. These specifications cover a friction tape composed of cotton sheeting impregnated with an adhesive insulating compound.

I. MANUFACTURE.

2. The cotton sheeting layer shall be made from a sheeting evenly and firmly woven from good cotton, and as free from unsightly defects, dirt, knots, lumps, and irregularities of twist as is consistent with the best manufacturing practice. The threads shall run in straight lines without waving, so as to reduce to a minimum the raveling of the cloth when cut into tape.

3. The frictioning compound shall be an adhesive and insulating compound practically free from free sulphur (not over 0.05 per cent) or other substances which would have a deteriorating effect on copper or other metals or on the fabric.

4. The fabric shall be thoroughly impregnated and evenly covered on both sides with the frictioning compound.

5. The thickness of the tape shall be not less than 0.013 nor more than 0.017-inch; when measured with a rubber spring micrometer with 0.4-inch diameter foot.

6. The compound shall adhere firmly to the fabric and shall not pull away from the fabric so as to leave bare spots when adjacent thicknesses of the tape are separated.

II. PHYSICAL PROPERTIES AND TESTS.

7. When the tape is held before a strong light, the number of pin holes noted per linear yard of tape, ¾-inch wide, shall not exceed two.

8. The tensile strength per ¾-inch width shall be not less than 30 pounds. The initial distance between the jaws of the testing machine shall be 12 inches, and the rate of separation of the jaws shall be 20 inches per minute.

9. When wrapped on a clean, smooth copper rod and baked at 100 degrees C. for 16 hours, the compound shall not discolor the copper.

10. (*a*) The adhesion of the friction coat of compound between the plies shall be such that when a strip of tape 2 feet long and ¾-inch wide is taken from a roll and wound upon a 1-inch mandrel under tension of 7½ pounds at the rate of 30 inches per minute, a weight of 3 pounds shall not cause the plies to separate at a greater rate than 30 inches per minute.

(*b*) After a strip has been exposed to dry heat at 100 degrees C. for 18 hours and then cooled to room temperature, a test specimen shall withstand the test prescribed in the paragraph (*a*), except that the weight applied to unwind the tape shall be 1 pound instead of 3 pounds.

11. The test for dielectric strength shall be made as follows: The tape shall be spirally wound with one-third lap on a smooth metal rod, 1 inch in diameter, for a distance of 6 inches. Two inches in the center shall be covered with tin foil and bound down securely with tape, and an alternating potential of 1,000 volts, of a frequency of not over 65 cycles, shall be applied for five minutes between the metal rod and the tin foil without puncture.

12. One ½-pound roll for each 250 rolls shall be selected at random for the various tests. At least two feet of the outer layers shall be removed and one specimen taken for each test. If the tape fails in any one test, two additional specimens shall be taken. If the tape fails in either of these two additional tests, the material shall be rejected.

III. STANDARD WEIGHT, DIMENSIONS AND VARIATIONS.

13. The net weight of the tape, ¾-inch wide, shall be not less than 8 ounces per roll, exclusive of core, wrapping, and box.

14. The length of ¾-inch tape shall be not less than 55 yards per pound.

15. The width shall not vary from that specified more than ±0.03-inch.

IV. PACKING AND MARKING.

16. Each roll shall be wrapped in oiled paper or metal foil and enclosed in a suitable box. The wrapping shall be secure and shall thoroughly protect the contents.

17. Each box shall be marked with the name of the manufacturer or trade-mark, and the nominal width and weight of the tape.

V. INSPECTION.

18. The tape shall be tested and inspected within four weeks of date of delivery.

[1]American Society for Testing Materials, Committee D-11 on Rubber Products.

In the Dutch East Indies there are now about 12,000 motor cars. Practically all imported since 1915 are of American manufacture. Previous to that Italian and French cars predominated and manufacturers in both countries are trying hard to regain the Dutch East Indian market.

What the Rubber Chemists Are Doing.

THE DETERMINATION OF SUBSTITUTE IN RUBBER.[1]

The accurate determination of substitute in rubber articles is somewhat difficult. The method usually followed for an approximate test is as follows:

Part of the residue of the acetone extraction is heated for four hours in a flask with reflux condenser with 50 cc. of half-normal alcoholic potash solution. It is then filtered and the residue washed a few times with boiling alcohol and then with boiling water. Filtrate and washing liquid are evaporated to 15 cc., brought into a separating funnel, and after acidifying with hydrochloric acid, shaken with ether. The layer of ether is brought into a weighed flask, the ether is evaporated, the flask is dried at 100 degrees, and the increase of weight of the flask indicates the percentage of factis acids.

The determination takes place in the material previously extracted with acetone for reason that rubber resins are also partly saponifiable.[2] However, the substitute also dissolves partly in acetone, and this part varies for the different kinds of substitutes. The percentage found in the alcoholic potash extract is therefore too low for two reasons:

1. One part of the substitute is extracted with the acetone;
2. With the determination of the percentage of "factis acids" the real substitute is not actually expressed.

The second error is not to be avoided but can never be considerable. To correct the first one as much as possible it has been proposed to determine the other substances in the acetone extract, and to conclude therefrom what percentage of substitute is present in the acetone extract. The percentage of factis acids found as alcoholic potash extract increased by the percentage of substitute in the acetone extract, yields then the total substitute.

Although this method is in general use,[3] a doubt arose when repeatedly using it as to the accuracy of its results. For that reason an investigation was decided upon and tests were carried out on a number of rubber mixings with substitute of which the composition was entirely known.

The rubber used was *Hevea* crêpe with an acetone extract of three per cent. As vulcanizing does not appreciably change the acetone extract, the percentage of substitute could be calculated in the acetone extract of the vulcanized samples, the percentage of free sulphur being known.

DETERMINATION OF SUBSTITUTE IN VULCANIZED RUBBER.

After previous extraction with acetone the alcoholic potash extract was determined in two grams of the acetone extracted material. The quantity of substitute in the acetone extract was calculated. The results are shown in the following table:

Determination of Substitute in Vulcanized Rubber.

No.	Substitute Added in Per Cent.	Acetone Extract.	Free Sulphur.	Substitute in Acetone Extract. A	Alcoholic Potash Extract. B.	Total Substitute in Per Cent. A + B.
1	10, brown	7.6	2.0	3.8	0.6	4.4
2	10, white	[illegible]	3.9	2.5	1.2	3.7
3	3, brown	4.3	1.8	0.7	0.3	1.0
4	3, white	5.4	2.9	0.7	0.3	1.0
5	1, brown	3.8	1.9	0.1	0.3	0.3
6	1, white	4.0	[illegible]	0.0	0.1	0.1
7	10, brown	10.9	4.2	4.1 (4.0)*	0.7 (2.1)*†	†4.8 (6.1)*
8	10, white	10.6	5.2	2.8 (2.6)	2.1 (0.9)†	4.9 (3.5)
9	3, brown	8.4	4.4	1.1 (0.9)	0.2 (1.1)	1.3 (2.0)
10	3, white	9.1	[illegible]	1.0 (0.8)	0.5 (0.3)	1.5 (1.1)
11	1, brown	8.1	4.7	0.4 (0.2)	0.2 (0.4)	0.6 (0.6)
12	1, white	8.4	5.4	0.1 (0.1)	0.2 (0.3)	0.3 (0.4)
13	without any	7.8	4.9	0.0 (0.0)	0.0 (0.4)	0.0 (0.4)
14	25, brown	[illegible]	1.5	[illegible]	14.4	23.6

*The figures between parentheses were found in the mixes 7 to 13 after having been vulcanized for 3 hours.
†Sample very finely cut.

The figures in the third column indicate that the part of the substitute originally soluble in acetone retains this property after vulcanization. This is true if the samples are further vulcanized, evident from the figures obtained from Nos. 7 to 13 having been treated for three hours (figures between parentheses).

The last column proves the important fact that in many cases the determination of substitute yields figures which, according to the method followed up to the present, are considerably too low.

No better results were obtained with stronger alcoholic potash solution. Normal solution, instead of half-normal, caused a sample with 10 per cent substitute to yield only 0.8 per cent alcoholic potash solution extract. A small improvement was noted on very finely cutting the samples, but even then the results were low.

The low results were due to inability of the alcoholic potash solution to penetrate completely the acetone extracted sample. It was demonstrated experimentally that extraction with half-normal alcoholic potash after suitable swelling of the sample, whether vulcanized or unvulcanized, in benzene gives satisfactory results provided the following precautions are observed.

1. Filtrate and washing liquid must be evaporated as far as possible. The reason for this has to be looked for in the fact that otherwise benzene is not sufficiently expelled and that therefore extraction with ether by shaking is not complete (compare results under A and B).
2. Benzene must be present in excess, giving too low results when this is not the case (compare under D); 1 to 6 contain mineral fillers and could suffice with 15 cc. benzene; 7 to 13, which do not contain any mineral fillers, require at least 20 cc. benzene (compare results under B and C).
3. The time of swelling also has some influence. It appeared to be desirable to let the rubber stand over one night with benzene (compare results under E).

DETAILS OF IMPROVED METHOD.

Two grams of acetone-extracted rubber is covered with 20 cc. benzene and left for one night; 40 cc. alcoholic potash solution, 0.5 N, is added and the liquid is boiled for about four hours with a reflux condenser on a water bath. It is then filtered and the residue washed with boiling alcohol and then with boiling water. Filtrate and washing liquids are evaporated nearly to dryness (3 to 5 cc.), rinsed into a separating funnel, and after acidifying with hydrochloric acid, extracted with ether by repeated shaking. The layer of ether is brought into a weighed flask, the ether is evaporated and the flask dried at 100 degrees Centigrade.

The author's investigation further demonstrated that the determination of substitute in compounds of rubber which contain asphalt is not feasible by the above method.

OXIDATION OF THE EXTRACTED RUBBER IN CONNECTION WITH THE DETERMINATION OF THE SUBSTITUTE.

Some observations were made in close connection with the above determinations of substitute which will be dealt with here. The acetone-extracted rubber kept in stoppered bottles appeared to be considerably altered after a few weeks. It is remarkable that only the vulcanized rubber changed considerably. The change is probably due to oxidation of the rubber. During a previous investigation on the non-saponificability of resins[2] it appeared that the oxidation products of rubber are soluble in acetone and saponificable for the main part.

It was demonstrated that the presence of substitute does not influence this oxidation and from the analytic results it follows that *the determination of the factis acids must take place directly after the acetone extraction.*

[1]By P. Dekker. "Communications of the Netherland Government Institute for Advising the Rubber Trade and the Rubber Industry," Delft, Holland.
[2]"Communications of the Netherland Government Institute," Part II (1917), page 49.
[3]W. A. Caspari, "India Rubber Laboratory Practice" (London, 1914), page 123; F. W. Hinrichsen and K. Memmler, "Der Kautschuk und seine Prüfung" (Leipzig, 1910), page 129.

Samples containing old ground rubber as a filler yield, after the second extraction with acetone, a considerable quantity of extract with alcoholic potash solution. It is to be expected that old rubber often will be present in more or less oxidized condition, for which due allowance must be made in interpreting the results.

METHODS OF ANALYSIS.

RAPID DETERMINATION OF GOLDEN ANTIMONY IN RUBBER GOODS.

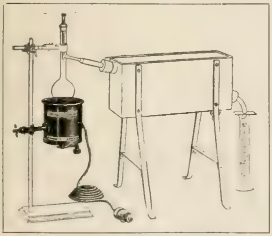
The following method for the rapid determination of antimony sulphide (golden antimony) in rubber goods and reclaimed rubbers is that of W. C. Schmitz,[1] given as translated in the "Journal of the Society of Chemical Industry," April 30, 1920, page 307A.

Two grams of the material is heated with 45 cc. of sulphuric acid in a 300-cc. Kjeldahl flask for 20 minutes; the cooled solution is then treated with 3 grams of ammonium persulphate and gently re-heated for 10 to 15 minutes longer after it has become colorless. The cooled liquid is diluted, almost neutralized, with ammonia regardless of any precipitate, feebly acidified with hydrochloric acid, and then saturated with hydrogen sulphide. The precipitate is dissolved in hydrochloric acid containing tartaric acid, and the filtrate, after expulsion of the hydrogen sulphide is titrated with potassium bromate using methyl orange as indicator. If the original material contains no iron the precipitation can be omitted; the colorless solution in sulphuric acid is heated for 20 minutes with 5 grams of potassium sulphate; a little potassium metabisulphite is introduced and the sulphur dioxide expelled by boiling; after repeating this operation twice more the liquid is diluted with 40 cc. of water, and 10 cc. of hydrochloric acid and a considerable quantity of tartaric acid added; titration is then effected as in the earlier process. The whole estimation needs two to four hours.

GASOLINE DISTILLATION METHODS.[2]

1. If the electric heater is used it is started and allowed to operate a few minutes first to warm it.

2. The condenser box is filled with water containing a liberal proportion of cracked ice.



Electric Gasoline Distillator.

3. The charge of gasoline is measured into the Engler flask from the 100 cc. graduate. This graduate is used as a receiver for distillates without any drying. This procedure eliminates errors due to incorrect scaling of graduates and also avoids the creation of an apparent distillation loss due to the impossibility of draining the gasoline entirely from the graduate.

4. The graduate is placed under the lower end of the condenser tube so that the latter extends downward below the top of the graduate at least one inch. The condenser tube is so bent that the tip can touch the wall of the graduate on the side adjacent to the condenser box. This detail permits distillates to run down the side of the graduate and avoids disturbance of the meniscus caused by the falling of drops. The graduate is moved occasionally to permit the operator to ascertain that the speed of distillation is right, as indicated by the rate at which drops fall. The proper rate is from four cc. to five cc. per minute, which is approximately two drops a second. The top of the graduate is covered by a piece of fiber board, the condenser tube passing through an opening. This minimizes evaporation losses due to circulation of air through the graduate and also excludes any water that may drip down the outside of the condenser tube on account of condensation on the ice-cooled condenser box.

5. A boiling stone (a bit of unglazed porcelain or other porous material) is dropped into the gasoline in the Engler flask. The thermometer, equipped with a well-fitted cork and with its bulb covered with a thin film of absorbent cotton (preferably the long-fibered variety sold for surgical dressings), is fitted into the flask with the thermometer bulb just below the lower level of the side neck opening. The flask is connected with the condenser tube.

6. The electric heater is raised until the flask is in contact with the opening in the top and the gasoline brought to its boiling point. In case it is desired to record the initial boiling point, the thermometer is read when the first drop falls from the end of the condenser tube into the graduate. The amount of heat is then increased so that the distillation proceeds at a rate of from four cc. to five cc. per minute. The thermometer is read as each of the selected percentage marks is reached (20, 50 and 90). In case maximum boiling point or dry point (one definition of end point) is to be measured, the heating is continued after the flask bottom has boiled dry until the column of mercury reaches a maximum and then starts to recede consistently.

7. Distillation loss is determined as follows. The condenser tube is allowed to drain for at least five minutes after heat is shut off and a final reading taken of the quantity of distillate collected in the receiving graduate. The distillation flask is removed from the condenser and thoroughly cooled as soon as it can be handled. This can be accomplished by using first an air bath and then immersing the bulb of the flask in the ice-water mixture in the condenser trough. The condensed residue is poured into a small graduate or graduated test tube and its volume measured. This residue is retained for the acidity test. The sum of its volume and the volume collected in the receiving graduate, subtracted from 100 cc. gives the figure for distillation loss. In case this loss exceeds two per cent, a check distillation should be run to ascertain whether such loss is due to the presence of highly volatile constituents or to failure to condense the lighter fractions on account of too strong heating at the beginning of the distillation.

[1] "*Gummi-Zeitung*," 1918, 33, 2 3.

[2] According to the Bureau of Mines, Technical Paper No. 214.

SWEET WAX.

Under the designation "Sweet Wax," a new compounding ingredient is being offered to rubber manufacturers. Its function is to render very smooth running a stock intended for delivery from a tubing machine, and in mold work to impart a highly polished finish to the article. The material also serves as a mild accelerator of vulcanization rather than as a retardant of the cure.

The material is a blend of hard, waxy hydrocarbons, neutral, of light gravity, and has a yellow to brownish color.

VULCANIZATION OF RUBBER BY MEANS OF ACCELERATORS.

J. L. B. Hasselt employs as accelerators combinations of nitro-sodium-ethylaniline with aromatic bases. These accelerators are said to be more active than either constituent alone. For example combinations of two molecules of nitro-sodium-ethylaniline may be used with one molecule of each of the following products: aniline, dimethylaniline, o-toluidine, p-phenylenediamine, x-naphthylamine.

The amount added to the rubber mixing is from 0.25 to 0.5 per cent. (*"Le Caoutchouc et la Gutta Percha."*)

CHEMICAL PATENTS.

THE UNITED STATES.

Method of coloring fibrous material, which comprises subjection of the material to the action of a solution of cadmium chloride and that of a polysulphide of an alkaline earth metal; finally applying a vulcanizable plastic compound. (Charles H. Dennison, Wollaston, assignor to American Rubber Co., Boston—both in Massachusetts. United States patent No. 1,332,974.)

Reclaiming and Regenerating Rubber Waste. The disintegrated material is subjected to the action of a heated liquid bath containing about 10 to 15 per cent by weight of caustic soda in water solution for approximately six to twenty hours at 50 to 200 pounds pressure per square inch. Subsequently the waste is treated by the action of a solvent mixture comprising the following materials in the approximate proportions by weight given: phenylenediamine, one part; paraffine oil, two parts; mineral rubber, two parts; rubber resin, two parts; acetic acid, two parts; subsequently the treated material is washed and dried. (Frank L. Kryder, Akron, Ohio. United States patent No. 1,340,777.)

Can-Sealing Composition, comprising rubber dissolved in a volatile solvent and china wood oil. (Theodore Cramp Wester, Baltimore, Maryland. United States patent No. 1,341,489.)

Sealing Composition. A plastic composition comprising a rubber solution and gutta siak. (Theodore Cramp Wester, Baltimore, Maryland. United States patent No. 1,341,490.)

Sound Absorbing Coating. A composition of matter and article of manufacture consisting of rubber and volatile spirits. (Clarence H. Bryce, Glen Ridge, New Jersey, assignor to Benjamin Moore & Co., Brooklyn, New York. United States patent No. 1,341,704.)

THE UNITED KINGDOM.

Antimony Pigment Suitable for Vulcanization is produced by decomposing a mixture of an antimony salt with alkali waste liquor by means of an excess of sulphuric or hydrochloric acid. Any proportion of the alkali waste liquor may be replaced by the product obtained by boiling lime with sulphur. (E. F. Morris, Holly Bank, Roby, near Liverpool, England. British patent No. 138,137. Reference is also made to Specification No. 11,827/84.)

Vulcanizing Rubber. Natural or synthetic rubber is vulcanized by the addition of salts of mono- or di-substituted dithiocarbamic acids and di- or tri-valent metals or inorganic radicals, and sulphur, the amount of sulphur being reduced to 2-0.2 per cent of the rubber. In an example, a mixing of 100 parts rubber, 0.5 parts sulphur, and one part paramethylene dithiocarbamate of zinc, with or without the addition of mineral oxides, reclaimed rubber, substitutes, and the like, is vulcanized in the usual manner. (G. Bruni, Milan, Italy. British patent 140,387.)

Vulcanizing Rubber. The substances added as described in patent No. 140,387, namely, salts of mono- or di-substituted dithiocarbamic acids and di- or tri-valent metals or inorganic radicals, are added to mixings containing the usual proportion of sulphur, and the product is vulcanized at a lower temperature than usual, or at the usual temperature in a shorter time. In an example, a mixing of 100 parts of rubber, eight parts sulphur, one part pentamethylene dithiocarbamate of zinc, with or without fillers, is vulcanized in five minutes at a temperature of 120 degrees C., or in 45 minutes at 90 degrees C., or in a few days at air temperature. (G. Bruni, Milan, Italy, British patent No. 140,388.)

Composition for Filling Tires, consisting of soya bean oil 24 pounds, chloride of sulphur six pounds, oxide of magnesia 17½ ounces and venetian red three ounces. The ingredients are mixed and poured into a mold. When hard, the composition is placed in the tire casing as a substitute for air. (F. A. Hager, 441 Hawthorne avenue, Portland, Oregon, U. S. A. British patent No. 140,781.)

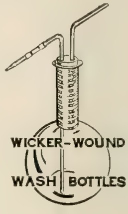
GERMANY.

Piperidine Piperidyldithiocarbamate, for use as a vulcanization catalyst, is prepared by the action of carbon bisulphide on an aqueous solution of piperidine at a low temperature; the presence of the water moderates the reaction. (Farbenfabriken, formerly Friederich Bayer & Co., Leverkusen, near Köln am Rhein. German patent No. 316,000, December 10, 1917.)

Process for Accelerating Vulcanization of natural or artificial rubber-like substances. (Stanley John Peachey, Stockport, England. German patent No. 323,088. February 17, 1915.)

LABORATORY APPARATUS.

WICKER-WOUND WASH BOTTLES.



Neat and durable wicker winding on the necks of flasks used as wash bottles is a welcome laboratory convenience when hot liquids must be handled. Wickering can also be applied to any glassware other than flasks or bottles, as convenience may require. (The Will Corporation, Rochester, New York.)

THE DAVON MICRO-TELESCOPE.

Micro-Telescope.

A patented English instrument for viewing objects is known as the "Davon" micro-telescope, shown in the illustration. The short focus type permits viewing specimens at a distance of from ten to 18 inches with magnification of from 15 to 38 diameters with large field and great depth of focus. A rod with a rubber foot is attached to the telescope so that the latter may be adjustably raised or lowered to the desired distance, the rubber foot serving as a non-slipping rest for the instrument. (F. Davidson & Co., 29 Great Portland street, London, W. 1, England.)

MERCURY SEALED ABSORPTION BULB.

Mercury Sealed Absorption Bulb.

The new Fleming patent mercury-sealed absorption bulb is automatically sealed when not in operation and has no inlet or outlet valves to turn off during the course of analysis. It eliminates errors because carbon dioxide or moisture will not escape even when the rate of flow of oxygen is as high as 600 per minute and there is no danger of trapping oxygen under pressure. The use of the new bulb reduces the number of weighings necessary and gives the analyst all the other advantages mentioned, in addition to those which have made the regular Fleming bulbs popular for carbon dioxide determinations by the combustion method. (Eimer & Amend, 211 Third avenue, New York City.)

VITREOSIL BEAKERS.

One can evaporate, bake, and ignite in the same vitreosil beaker, since the negligible expansion of vitreosil over any range of temperature insures it against injury by the most severe heating, by quick water-cooling, or by the addition of cold acid to the hot utensil.

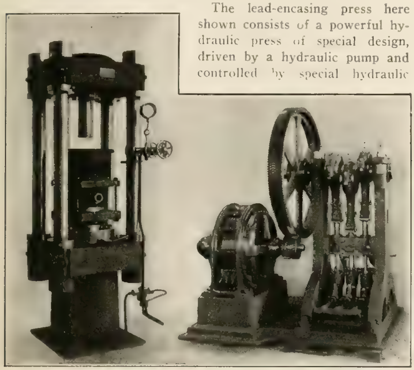
After evaporating an acid solution to dryness in a vitreosil beaker, the residue may be baked at the highest temperature available or strongly ignited over the blast lamp in the same beaker, without the least danger of breakage. (The Thermal Syndicate, Limited, 50 East 41st street, New York City.)

New Machines and Appliances.

HYDRAULIC LEAD-ENCASING PRESS.

Rubber-hose making requires various machines of special design but not one is more interesting than the machine that covers the uncured hose in continuous lengths with lead, that in reality is a mold which applies a plain, corrugated or ribbed, surface to the vulcanized hose.

The lead-encasing press here shown consists of a powerful hydraulic press of special design, driven by a hydraulic pump and controlled by special hydraulic operating valves. These presses are usually made in two sizes, 650 tons and 1,000 tons capacity. The lead-encasing equipment comprises a lead-holding cylinder of alloy steel fitted with a wrought steel steam jacket and an oil-hardened and heat-treated alloy steel ram for forcing the lead downward through the cylinder. Located immediately below the lead cylinder is a block containing the lead-encasing dies and chambers through which the hose passes in a horizontal plane. There are several sizes of die blocks and dies for covering the ranges of hose from ¾-inch to 3-inch outside diameter. There are other special devices in connection with the die block and dies for perfecting the lead-encasing operation. The press is set on a foundation so the floor is level with the top of the hydraulic cylinder and the reels for the uncovered and covered hose are placed on the floor at opposite sides of the press.



Lead Press and Hydraulic Pump.

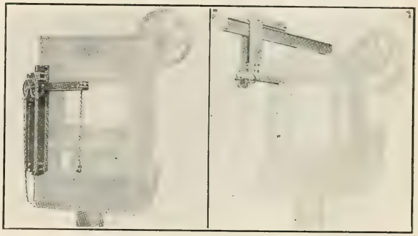
The operation is briefly as follows: the uncured hose is brought on a reel to the press, the cylinder of the press being charged with lead, the hydraulic pressure is applied and the lead covering is extruded through the die block in a horizontal direction. As the lead tubing moves outwardly, the end of the rubber hose is inserted into the opposite side of the die block and is lead-encased as the lead tubing is extruded. It is then wound on a special steel reel on the exit side of press. After the first charge of lead is exhausted, the cylinder is refilled and the process repeated whereby any length of hose can be encased without joints or seams. The reel of lead-encased hose is then placed in a vulcanizing oven and internal pressure applied to the hose during the vulcanizing process, after which the lead-encased hose passes through a stripping machine which removes the lead covering and the hose is ready for packing and shipping. (John Robertson & Co., 121-137 Water street, Brooklyn, New York.)

SOLID TIRE PRESS CRANES.

The labor-saving devices here pictured will interest tire factories, service stations, and garages, as one man can easily handle heavy truck wheels with these cranes. As the larger sizes of wheels consume most of the space between the two platens of the press, the cranes should operate in a very small space. Therefore they have been made exceptionally compact without impairing their strength. The hoisting mechanism is especially efficient, with automatic brake, and is built into the crane framework. All gears are machine cut from solid blanks.

The mast jib crane is arranged for attaching to the left-hand vertical column of the press. The boom occupies only 4 inches of space and swings over a large arc. When not in use it can be swung out of the way.

The monorail crane operates on an I-beam track attached to the top of the press in the center. It has four single-flange track wheels with hardened steel roller bearings, insuring free movement and long life. The boom requires only 4 inches of head room. When not needed at the press, it can be moved out of the operator's way, or used independently as part of the track system. (The Chisholm-Moore Manufacturing Co., Cleveland, Ohio.)



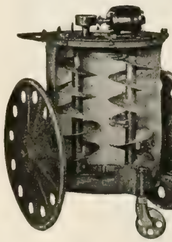
Mast Jib Type. Monorail Type.

One-Ton Tire Press Cranes.

A NEW SOLUTION MIXER.

A new and novel mixer for liquids, semi-liquids and soluble materials which is meeting with success in handling rubber cement and other compounds, is shown in the accompanying illustration.

The agitating or mixing is accomplished by upper and lower flights mounted and opposing each other on vertical shafts, which revolve and also rotate about the container. The lower flights raise the heavy material from the bottom and the upper flights lower the light material from the top and the rotating movement about the container imparts a complete three-way movement, whereby every particle of material is displaced.



The Triplex Mixer.

The portable type is made in three sizes, 10, 20 and 50 gallons capacity. The 10 and 20-gallon mixers are hand-portable and hand-operated. The 50-gallon mixers are wheel-portable and

motor-driven. The stationary type is made in 50 to 3,000 gallons capacity, and may be driven by motor or belt. (The Cleveland Mixer and Manufacturing Co., Cleveland, Ohio.)

TIRE CASING INSPECTING MACHINE.

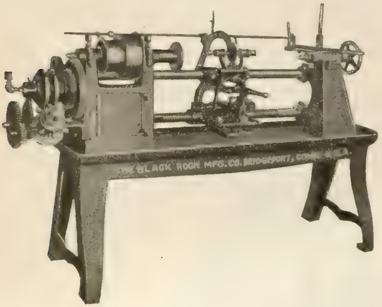
The accompanying illustration shows a novel machine designed as an aid to the tire manufacturer, dealer, and repairman in discovering defects in the tire.

Robertson's Tire Inspector.

The tire is hung on the sliding head, which adjusts itself, and the pulling fingers are placed over the beads. Pressure applied on the foot lever spreads the beads apart and at the same time the bottom support pushes up or bulges the tread inward. This opens any breaks or imperfections in the fabric, which sometimes are not easily detected by the old methods. While the casing is on the machine, the hands are free to turn it and to chalk-mark rim cuts, loose spots on the tread, and other defects. Blind nails are easily found and extracted while the tire is spread; tubes that are stuck to the casing are taken out, without danger of tearing; and new tubes are easily inserted or old ones removed from stiff cord tires. (W. H. Robertson, 223 North Church street, Rockford, Illinois.)

MACHINE FOR CUTTING RUBBER WASHERS.

Rubber washers are now being cut accurately at a speed that heretofore has not been obtained commercially. The work is done on an automatic machine—here illustrated. It will cut



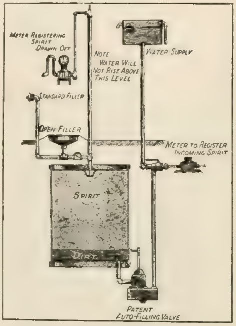
Automatic Washer Cutting Lathe.

washers having inside diameter ranging from ⅜ to 5 inches, in widths varying from 1/32-inch to ¾-inch.

The cutting is done by a circular knife that is rotated by the stock and forced into it by the action of the cam. It is fed by a screw that is operated by a silent, smooth-acting cam. Variations in width are made by changing the feed-screw gears. This machine will take tubing 27 inches in length, having inside diameter of ⅞-inch and over; for lesser diameters than ⅞-inch it takes tubing 11½-inch in length. The short length tubing is required on account of the small size of the mandrel. (Black Rock Manufacturing Co., Bridgeport, Connecticut.)

RUBBER SOLVENT STORAGE SYSTEM.

A new system for distributing inflammable rubber solvents, such as petrol, naphtha, etc., has been devised, which is adaptable to any quantity from a small tank to a system provided with many drawoff points. It is worked by hydraulic power which distributes the solvents automatically to any level at which the factory's water storage can be applied.



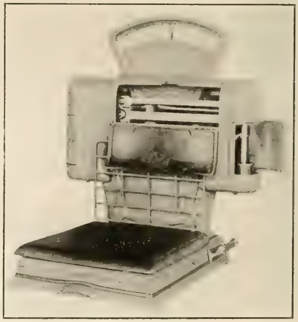
Bywater Naphtha Storage.

The storage tank is placed below the ground or at any convenient point for receiving the solvent from railroad or water carriage. A meter is arranged to measure the quantity run into the tank. Water from the main supply is let into the tank, when the oil or spirits rise to the top and any dirt or foreign matter sinks into the water. This accumulation is drawn off later when the tank is refilled with solvent.

The naphtha flows through the connecting pipes to the point where a draw-off is needed in any part of the factory. A great saving is obtained in evaporation by this system, as the storage tank and the connecting pipes are kept full. Meters can be placed at any point, by which the supply can be gaged, and absolutely pure solvent can be drawn off without any risk of fire or loss. (Bywater & Co., 121 Kingsway, London, W. C. 2.)

SPECIAL SCALE FOR RUBBER COMPOUNDING.

Scales are of such importance in rubber compounding that special weighing devices have been designed for use in the compound room. The one here pictured is of the predetermined weight type, having no graduations on the chart with the exception of a single reading line in the center. It has two beams, the lower one of ten pounds capacity, graduated in ounces, and the upper of two pounds capacity, graduated either in quarter ounces or one one-hundredth pounds, as the formula requires. Extra counterpoise weights are furnished so that the total capacity of the scale is 102 pounds, and it will handle all ingredients from lamp black to rubber.



Compounding Scale.

The entire beam and counterpoise mechanism is encased in a dust-proof aluminum housing having three doors; the upper door covering the beams being equipped with a Yale lock, the right-hand door covering the counterpoise being so arranged that it cannot be opened except when the upper door is open, and the left-hand door opening into a compartment which may be used for the storage of weights. The scale is built upon the four-point principle of lever construction, is without check or stabilizing mechanism of any description, has agate bearings throughout, and is exceptionally sensitive and accurate. (Detroit Automatic Scale Co., Detroit, Michigan.)

MACHINERY PATENTS.

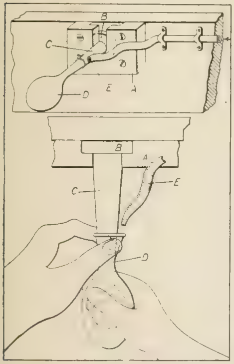
VARIABLE SPEED DRIVE FOR RUBBER MILLS.

THIS INVENTION relates to an improved method of driving the rolls of rubber mills, consisting, essentially, in driving the front rolls of a single mill or the front rolls of a series of mills, and the back roll of a single mill or the back rolls of a series of mills by two variable speed electric motors so that the speed ratio between the front and back rolls can be varied to any desired amount. (Frederick Iddon, Leyland, England, United States patent No. 1,342,114.)

STRIPPING DIPPED GOODS FROM CURING FORMS.

The illustration shows a perspective and plan view of the apparatus which is briefly described as follows:

Bracket *A* is attached to the edge of a bench or other suitable support arranged with a slot to receive the flanged end *B* of the form *C* carrying the object *D* to be removed by air inflation through the compressed air outlet *E*.



TOY BALLOON STRIPPING MACHINE.

The mode of operation is clearly shown in the lower illustration, where a pocket is formed by pressure of the operator's thumb and forefinger for the entrance of compressed air between the form and the rubber object, which is thus detached by slight inflation and easily stripped from the form. (William Gregg Lerch, assignor to The Miller Rubber Co., both of Akron, Ohio. United States patent No. 1,330,595.)

IMPROVED AIR BAG.

To avoid permanently stretching the air-bag through repeated use, a plurality of removable layers of fabric and rubber, preferably in the form of a series of sets of overlying or superimposed patches, are applied to the outer surface of the bag so as to approximately cover it. These patches are applied with cement after a preliminary dusting with soapstone so that while they will adhere sufficiently to enable the bag to be handled in the ordinary manner they are individually removable.

After the first tire is cured thereon an outer patch (or patches) is removed, thus decreasing the dimensions of the bag by a small amount, but sufficient to compensate for the permanent stretch of the bag. This process is repeated until all the layers or patches are removed, at the end of which time the bag has reached the limit of its stretch. (Frank Fenton, assignor to The Miller Rubber Co., both of Akron, Ohio. United States patent No. 1,335,101.)

APPLYING REPAIR-TIRES TO WORN CASINGS.

Worn casings are repaired according to this invention by applying cement to one or both parts, allowing it to become tacky, applying the tread portion of the repair tire to the tread of the casing while in normal form, deforming the sides of the casing to increase their superficial area, and then rolling down the sides of the repair-tire while the casing is in its deformed condition. (Charles C. Gates, assignor to the Gates Rubber Co., both of Denver, Colorado. United States patent No. 1,341,121.)

OTHER MACHINERY PATENTS.

THE UNITED STATES.

NO. 1,339,451. Centering ring for tire heads. W. F. Goff, Akron, O., assignor to The B. F. Goodrich Co., New York City.

1,339,815. Machine for sawing tire cores. J. C. Fiddyment, Akron, O.

1,339,816. Machine for finishing tire molds. J. C. Fiddyment, Akron, O.

1,340,440. Apparatus for treating tires during vulcanization. F. G. Flegal, assignor to The Savage Tire Co.—both of San Diego, Calif.

1,340,641. Repair vulcanizer. H. K. Wheelock, Los Angeles, Calif., assignor to Western Vulcanizer Manufacturing Co., a partnership, Chicago, Ill.

1,340,642. Repair vulcanizer. H. K. Wheelock, Los Angeles, Calif., assignor to Western Vulcanizer Manufacturing Co., a partnership, Chicago, Ill. (Original application divided.)

1,340,882. Apparatus for making articles from sheet rubber, such as bathing caps, etc. R. A. Freeman, Flushing, N. Y.

1,340,883. Apparatus and method for binding edges of rubber bathing caps, etc. R. A. Freeman, Flushing, assignor to I. B. Kleinert Rubber Co., New York City—both in New York.

1,340,884. Machine for making sheet-rubber articles, such as bathing caps, etc. R. A. Freeman, Flushing, N. Y.

1,341,422. Guard for rubber mills and similar machines. L. Gaisman, assignor of ½ to S. Dreyfus—both of Manchester, England.

1,341,500. Tire-building stand. C. L. Durham, Salina, Kans.

1,341,726. Tire-changing machine. I. A. Weaver and J. Sternaman, Jr., assignors to Weaver Manufacturing Co.—all of Springfield, Ill.

1,341,727. Tire changer. I. A. Weaver, assignor to Weaver Manufacturing Co.—both of Springfield, Ill.

1,341,728. Tire-changing appliance. I. A. Weaver and J. Sternaman, assignors to Weaver Manufacturing Co.—all of Springfield, Ill. (Application divided.)

1,341,729. Tire-changing mechanism. I. A. Weaver, assignor to Weaver Manufacturing Co.—both of Springfield, Ill. (Application divided.)

1,341,730. Tire-removing appliance. I. A. Weaver and J. Sternaman, assignors to Weaver Manufacturing Co.—all of Springfield, Ill. (Application divided.)

THE DOMINION OF CANADA.

199,970. Rubber mixer. F. Iddon, Leyland, Lancaster, England.

200,066. Mold for making inner tubes for pneumatic tires. The Dunlop Rubber Co., Limited, Westminster, County of London, assignee of Colin Macbeth, Birmingham, County of Warwick—both in England.

200,067. Machine for calendering vulcanite bases. The Dunlop Rubber Co., Limited, Westminster, County of London, assignee of Colin Macbeth and Harry Willshaw, both of Birmingham, County of Warwick—both in England.

200,169. Tire mold. H. Raflovich, Buffalo, N. Y., U. S. A.

200,349. Mold for vulcanizing pneumatic tires. W. Seward, Baltimore, Md., U. S. A.

THE UNITED KINGDOM.

140,024. Repair vulcanizer. F. O. Lake, 58 Rhode Island avenue, Washington, D. C., U. S. A.

140,317. Tool for abrading rubber surfaces preparatory to patching. F. N. Cordell, 709 Pine street, St. Louis, Mo., U. S. A.

140,893. Apparatus for making solid tires, washers, etc. F. Offenhauser, Tarrytown, N. Y., U. S. A.

140,875. Manufacture of cushion tires. A. J. Ostberg and A. Kenny, Judd street, Richmond, Victoria, Australia.

THE FRENCH REPUBLIC.

502,650. Apparatus for constructing pneumatic tires. E. Hopkinson, New York City, U. S. A.

502,848. Improvements in apparatus for regenerating treads and tires. S. H. Goldberg, Chicago, Ill., U. S. A.

502,849. Improvements in apparatus for rebuilding tire treads. S. H. Goldberg, Chicago, Ill., U. S. A.

PROCESS PATENTS.

THE UNITED STATES.

NO. 1,339,696. Producing tire-patch material. C. O. Duffy, Dallas, Tex.

1,339,789. Subjecting molded rubber articles to sufficient heat to remove surplus rubber from edges. R. Rothwell, Keyport, and W. H. Cuttrell, Matawan, N. J., assignors to Whitall Tatum Co., New York City.

1,340,452. Manufacture of balls from plastic material. D. S. Landstra, South Orange, N. J.

1,340,965. Repairing tires and tubes. T. A McAllister, Augusta, Ga.

1,341,247. Manufacture of inner tubes. J. J. Shoemaker and C. C. Cox, Akron, O.

THE DOMINION OF CANADA.

200,350. Vulcanizing pneumatic tires by utilizing internal pressure of vulcanizing chamber. W. Seward, Baltimore, Md., U. S. A.

200,400. Manufacture of vulcanized rubber heels. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of W. J. Kent, New York City, U. S. A.

THE FRENCH REPUBLIC.

503,099. Method for doing away with the chief cause of wear in pneumatic tires. J. Mallet and A. Capponi.

MOTION STUDY STOP-WATCH.

Stop-watches are not a new idea but the recent demand for greater production has made necessary more accurate and conveniently arranged stop-watches for industrial time study.

DECIMAL STOP-WATCH.

The stop-watch illustrated herewith is specially designed for industrial purposes and can be held in one hand while the other is free to write. The watch is started and stopped by a catch at the left of the stem, which is pushed in one direction to stop and another direction to start. If it is desired to bring the stop back to O the stem is pressed in. The large dial is divided, not into minutes and seconds, but into 100 parts to the minute. In other words, the division is a decimal one. This makes it easy to compute cost figures by multiplying the decimal fraction of a minute which is obtained directly from the watch. The small dial reads in minutes and runs to 30 minutes. This watch is a great convenience in making time studies and is far superior to those divided into fractions of seconds. (Educational Exhibition Co., 26 Custom House street, Providence, Rhode Island.)

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Requests for each address should be on a separate sheet, and state number.

DISTRICT OFFICES.

New York: 734 Customhouse.
Boston: 1801 Customhouse.
Chicago: 504 Federal Building.
St. Louis: 402 Third National Bank Building.
New Orleans: 1020 Hibernia Bank Building.
San Francisco: 307 Customhouse.
Seattle: 848 Henry Building.

COOPERATIVE OFFICES.

Cleveland: Chamber of Commerce.
Cincinnati: Chamber of Commerce; General Freight Agent, Southern Railway, 96 Ingalls Building.
Los Angeles: Chamber of Commerce.
Philadelphia: Chamber of Commerce.
Portland, Oregon: Chamber of Commerce.
Dayton, Ohio: Dayton Chamber of Commerce.

(32.846.) A bicycle merchant in Bulgaria wishes to secure an agency for 20 to 100 bicycles, 100 to 1,000 bicycle tires, 100 to 1,000 inner tubes. Quotations c. i. f. Bourgas. Payment in leva. Correspondence in Bulgarian or French.

(32,873.) A firm in Czechoslovakia desires an agency for motorcycles, light cars and tires. Quotations c. i. f. Hamburg. Payment in currency or credit terms. Correspondence may be in English.

(32,905.) Commercial agent in Spain wishes agency for sale of balata belting. Quotations c. i. f. Spanish port. Correspondence in Spanish or French.

(32,908.) Representative of a firm in United States, sailing for Spain, desires agency for druggists' sundries in Spain and Portugal.

(32,910.) Retail drug company in Canada wishes to buy druggists' sundries. Quotations f. o. b. Canadian port.

(32,944.) A dental surgeon in Poland wants an agency for the sale of dental supplies, including rubber dam and rubber for vulcanizing. Quotations c. i. f. Danzig or f. o. b. New York. Correspondence may be in English.

(32,952.) Commission merchants in Poland wish exclusive agency for sale on commission of all kinds of rubber, in Poland and Lithuania. Quotations c. i. f. Danzig. Payment against documents after arrival of goods.

(32,953.) Cooperative association in Argentina wishes agency for sale of belting. Payment on arrival of goods in Argentina. Correspondence in Spanish.

(32,956.) Commercial agent in Australia wishes agency for sale of braces and men's garters.

(32,981.) American firm having connections with Australia and European countries desires an agency for the sale of rubber heels from manufacturers who can make up their wares for export under special labels.

(32,986.) A retail druggist wishes to buy and to secure an agency for druggists' sundries. Quotations f. o. b. Canadian port.

(33,004.) American representative of firm in Colombia wishes agency for sale of elastic webbing.

(33,005.) Commercial agent in Switzerland desires agency for sale of india rubber. Quotations French or Belgian port. Correspondence may be in English.

(33,012.) Manufacturers' agent in Australia desires direct representation of manufacturers of druggists' rubber goods.

(33,029.) A firm in Mexico wishes an agency for sale of tennis shoes with rubber soles, which are very popular for everyday wear. Quotations f. o. b. western ports. Correspondence may be in English.

(33,035.) A firm in India desires an agency for the sale of surgical, dental, and rubber goods.

(33,039.) An importer in the Maltese islands wishes an agency for rubber tires for motor cars and cycles. Payment against documents in local banks.

(33,047.) Importing company in South Africa desires agency for sale of rubber goods and surgical appliances.

(33,065.) A commercial association in Italy desires to secure an agency for the sale of prime materials for rubber factories. Quotations c. i. f. Genoa. Payment in United States currency. Correspondence may be in English.

(33,089.) The administration of a city in Austria wishes to make contracts for a supply of solid and pneumatic tires for 150 automobile trucks, 80 passenger automobiles, and 25 omnibuses, to be delivered as they are needed.

RUBBER SCRAP DIVISION MEETS.

A meeting of the Scrap Rubber Division of the National Association of Waste Material Dealers, Inc., was held at the Hotel Astor, New York City, on Wednesday morning, June 16, with Nat E. Berzen presiding. A special committee consisting of H. H. Cummings, Herman Muehlstein, and J. W. Long was appointed to deal with changes in the Scrap Rubber circular. Other matters discussed were of a routine nature.

THE PONY BLIMP, A ONE-MAN DIRIGIBLE MANUFACTURED BY THE Goodyear Tire & Rubber Co., has been placed upon the market and the United States Government was one of the first purchasers. Contracts were recently closed for two by government officials in Akron.

New Goods and Specialties.

THE "BROWNFOOT" RUBBER BOOT.

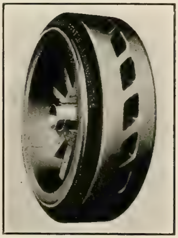
A HANDSOME RUBBER BOOT comes to us from Canada. It has a brown foot, with sole and heel of the same color, and a white top trimmed with brown top bead. The trade mark on the side, near the top, is also brown. The boot is made of high-grade white and brown rubber and is lined with duck. It comes in three heights, styled, variously, hip, "Storm King" (thigh), and short, for men. The sole is knurled and the brown foot has a fancy tab effect at back and front, reaching some distance upward on the white leg part.

THE "BROWNFOOT."

A very similar boot called the "Grayling" is made by the same manufacturer. It is chiefly of gray rubber and instead of having the foot of contrasting color, has the white foxing at the edge above the sole. It is made of extra quality rubber and is friction lined. This boot comes in the same heights for men as the "Brownfoot," and also in short length for boys. (Gutta Percha & Rubber, Limited, 47 Yonge street, Toronto, Ontario, Canada.)

NEW SINGLE SOLID TIRE.

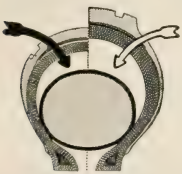
The newest single solid tire attempts to overcome the chief cause of internal friction and dissipate the frictional heat generated by traction by means of deep depressions with cross-bars of rubber between, at regular intervals around the circumference of the tire. The depressions go deep enough to reach below the point where a tire is ordinarily worn to the limit of its serviceability, the tire thereby retaining its distinctive qualities without requiring additional attention such as regrooving, etc. At the same time the shape of the depressions is such that stones and other foreign bodies cannot permanently lodge within them. (United States Tire Co., New York City.)



THE "MONOTWIN" TIRE.

AN INNER TUBE FOR CORD TIRES.

In order to use inside a cord tire the ordinary inner tube which was designed to fit a fabric tire, it must be inflated far beyond what was intended to be its normal point of stretching. This tends to weaken the wall, both because of overstretching and of increased friction.



THE "HORSE-SHOE RE-CORD" INNER TUBE.

The accompanying diagram in cross-section illustrates the additional amount of space to be filled by the inner tube in a cord tire, as compared with that within a fabric tire. The black arrow indicates the cross-section of a five-inch fabric tire and the white arrow the cross-section of a cord tire.

The "Horse-Shoe Re-Cord" inner tube has been designed purposely to meet these conditions. Its wall is thicker than that of the ordinary inner tube, because it is composed of nine plies of high-grade laminated rubber instead of the more usual six. Its name is intended to emphasize its greater ability to meet the required conditions. This inner tube is brown. (Racine Auto Tire Co., Racine, Wisconsin.)

TENNIS RACKET COVER.

A rubber sheath to cover tennis rackets is something that should appeal to all those who take pride in keeping their sporting equipment in prime condition. This sheath is in two parts, each having an appearance similar to that of a bathing cap, except that the portion that fits over the lower part of the racket has an opening to permit the passage of the handle. The handle is gripped firmly by the rubber, the upper portion of which overlaps the lower, providing an entirely waterproof covering. The regular tennis case may be used over the rubber one if additional protection is desired or should be requisite.

TAYLOR TENNIS SHEATH.

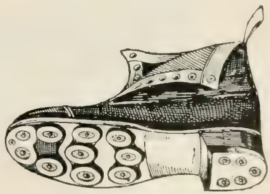
PATENTED REPAIR KIT.

A handy repair kit that comes put up in a neat box is intended for use in mending footballs, baseballs, bladders for game balls, and other rubber articles. It has been officially approved by the Board of Education of the City of New York and is particularly recommended by the manufacturer for practical use in gymnasiums, colleges, schools and camps. The box is convenient in size, namely, 7 by 9 by 3 inches, and contains the necessary tools and materials, including a special patented device for the emergency repair of necks of bladders. The tennis racket sheath and repair kit are put out by the same house. (Alex Taylor & Co., Inc., 26 East 42d street, New York City.)

(Patented April 22, 1920.)

ENGLISH SOLE-PADS.

From England come the "Double Arch" sole and heel pads in sizes to fit all boots. They are interchangeable and may be arranged in six different ways. The rubber pads are attached by leather disks which, it is claimed, insure a perfect fastening to the boot. This idea is registered in the patent office of the United Kingdom. (J. P. Cochrane & Co., Albert street, Edinburgh, and 29 Farringdon street, London, E. C. 4.)



"DOUBLE ARCH" PADS.

MOLDED RUBBER FISH LURES.

A line of cleverly simulated insects has been developed in molded rubber for the purpose of deceiving the wily fish into biting at the hooks these ingenious lures conceal. The entire line comprises ten numbers, including representations of the crawfish, two sizes of helgramite with bucktail, a medium and a small-sized helgramite, four sizes of cricket ranging from the extra small to the large, three sizes of grasshopper, and a large crawfish and helgramite. The articles are all extremely lifelike. The illustration shows three numbers of the line, all of which are artfully molded in soft rubber. (W. J. Grube, Delaware, Ohio.)

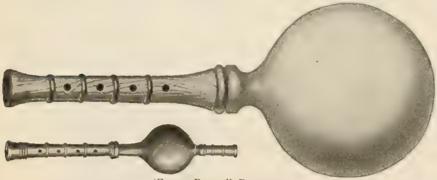
Helgramite.

Grasshopper.

Cricket.

FOUR-HOLE BAGPIPE BALLOONS.

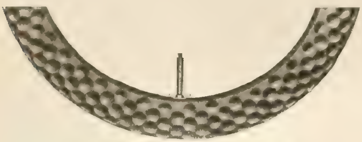
Toy manufacturers are busy these days and the time for fairs, summer fêtes, and other occasions when Young America delights in anything that will produce a noise, offer opportunity. Two ingenious balloons of the squawker type, modified to produce notes which sound like a bagpipe, are shown here. The mouthpieces are shellaced and the lower one is so constructed that, when released from the mouth, all air that has passed into the bag will pass out through the tone pipe. The bags are of high-grade red rubber and of sufficient weight to permit excess inflation and moderately rough usage. (The Eagle Rubber Co., Ashland, Ohio.)



"Eagle Brand" Bagpipes.

INNER TUBE THAT MINIMIZES BLOW-OUTS.

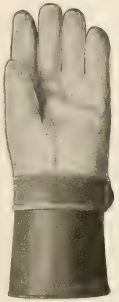
A new pneumatic inner tube is so molded under compression that several hundred small depressions or pockets are geometrically distributed over the portion which comes next to the casing. If the tube is punctured, the excess rubber in these compressed portions immediately expands to prevent the escape of the air within. (The Climax Rubber Co., Columbus, Ohio.)



The "Climax" Compressed Inner Tube.

"SAFETY FIRST PULL-OVER" GLOVE.

A glove that is made to meet the demand for toughness without bulk, service without clumsiness, and wear-resistance where the wear comes hardest, is embodied in the one shown in the accompanying illustration. It is made of light-weight "stay soft" horsehide that is tough but entirely flexible and will, it is claimed, remain soft and pliable in spite of wetting. It has a sewed outseam and because of its construction and size can be easily pulled over any rubber glove. This is an especially desirable feature, as many gloves cannot be so used. (O. C. Hansen Manufacturing Co., Milwaukee, Wisconsin.)



"Safety First Pull-Over" Glove.

RUBBER RETAINER FOR BATTERIES.

In service, the positive plates of a battery tend to shed their active material, and as far as this takes place the battery wears out. One battery manufacturer has devised a slotted retainer made of hard rubber in a tough, thin sheet which is placed against the active material on each side of each positive plate. The slots are sufficiently numerous to permit the free passage of acid and current but so narrow as to make the retainer practically a solid wall to hold the active material firmly in place. A special machine is employed to manufacture the "Philco" slotted retainer, because hard rubber is not easily cut and any tool used for the purpose tends to dull or break very quickly. It took five years to perfect this machine, developing it from the first crude model to the efficient device of today. (Philadelphia Storage Battery Co., Ontario and C streets, Philadelphia, Pennsylvania.)

"Philco" Slotted Battery Retainer.

ACHILLES TIRES.

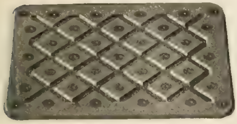
This is the "day" of the tire manufacturer and each new company, however like or unlike other tires its product may be in actual construction, must identify its product to the public by an individual distinctive tread design. The design on the left, called the "Butterfly," is that of an oversized, high-grade pneumatic tire, made with an extra ply of fabric. The one on the right is the "Reindeer," a lower-grade pneumatic tire, made under special brands for large distributors. (The Achilles Rubber and Tire Co., Inc., Binghamton, New York.)

Achilles "Butterfly" and "Reindeer" Tires.

A PRACTICAL MAT FOR THE RUNNING BOARD.

A mat of attractive pattern, imitating diamond-shaped tiling blocks, is the "Motomat," intended for automobile running boards. It is made of the same kind of stock used in the rubber mats put on the steps of Pullman cars and is easily cleaned with a

whisk broom or stiff brush. The "Motomat" may be attached to a wooden running board by means of nails passed through the metal disks in the corners or by substituting small screws for the nails and using a quick-drying rubber cement to fasten the mat permanently in place. If the running board is of metal, the mat may be attached by means of flat-head stone bolts with lock washers. The "Motomat" is made in one size only—7⅛ by 11¼ by 3/16 inches.



The "Motomat."

A SEMI-CIRCULAR CUT-OUT RUBBER MAT.

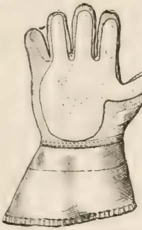
The modern dentist or barber can now complete the entire sanitary equipment of his place of business by adding the "Circomat." This is a semi-circular rubber mat, made of a good quality of rubber stock with a canvas backing, and having a corrugated surface so designed that the corrugations run outward from the center to make it easy to clean. The outer edge is beveled so that the mat need not be taken up each time the room is swept or cleaned. The "Circomat" is made in several thicknesses, but the ¼-inch is particularly recommended, as this will lie on the floor without buckling. The central portion of the mat is cut away in a semi-circle varying from 17 to 24 inches in diameter, to fit the pedestal of a barber or dental chair, and the outside diameter is 72 inches. The "Circomat" is made in solid colors only—black, white, gray, red, or green.

The "Circomat."

Both the "Motomat" and the "Circomat" are products of the same manufacturer. (United States Rubber Co., New York City.)

RUBBERIZED COTTON GLOVES.

The "Wearflex" cotton gloves, reinforced in one style by being rubberized and in another by the application of rubber and rubberized fabric inside the palm and fingers, provides for various classes of workers an inexpensive, comfortable glove that will outwear a glove made of cotton alone. The palm-faced glove is designed especially to meet the demand for a suitable glove to wear in factories and is unusually flexible for a glove that will wear as well. These gloves are desirable for use by farmers, firemen, masons, miners, molders, plumbers, steam fitters, iron workers, mill men, excavators, etc. (The McAdoo-Akron Co., Akron, Ohio.)



"Wearflex" Glove

THE BURKE "GRAND PRIZE" GOLF BALL.

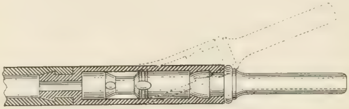
The "Grand Prize" golf ball is the result of three years of experimentation on the part of the manufacturers, and is said to be true in flight and remarkable for distance. The core and cover have been developed according to special formulas and are designed to withstand hard usage. (Burke Golf Co., Newark, Ohio.)

THE "JAYHAWK" GOLF BALL.

Another new golf ball with a covering of white gutta percha has been added to the season's offerings in this line. It has the dimple recessed marking and is enameled with a special gloss finish. It comes in two sizes, 29 and 31 pennyweights. (Schmelzer Arms Co., Kansas City, Missouri.)

INGENIOUS VALVE SHUT-OFF FOR SYRINGES.

An invention which dispenses with the usual metal clip comprises a fountain-syringe valve seat and valve of rubber, located near the juncture of tube and pipe, operated with one hand by rocking the parts against the elasticity of the conduit which encloses and holds the parts in alinement. The valve closes instantly on release. (Patent applied for by H. H. McGee. Goodyear's India Rubber Glove Manufacturing Co., Naugatuck, Conn.)



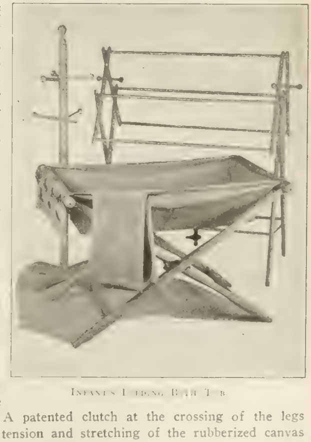
Rubber Valve and Shut Off for Syringes.

THE "FLEX-O-TYTE" FAN BELT.

A fan belt for Ford cars is composed of two thicknesses of bias-woven rubber-coated fabric, wrapped, cured, and cemented together. It is claimed by the manufacturer that this fan belt is proof against heat, water, and oil, and that it will not stretch. (A. J. Stephens Rubber Co., Kansas City, Missouri.)

INDIVIDUAL TUB FOR INFANTS.

Baby can now have the luxury of his own private bath tub, wherever he is. It is made of extra heavy canvas duck, without seams, double coated with white rubber, and is guaranteed by the manufacturer against leaking. There is an outlet faucet of hard rubber at the bottom of the tub and attached at one end are rubber pockets for toilet articles. The frame, which can be folded up compactly, is made of wood in either the natural or white enamel finish. A patented clutch at the crossing of the legs prevents undue tension and stretching of the rubberized canvas of which the tub is composed. The towel bar is covered with white rubber tubing. (New York Bath Manufacturing Company, 103 Chambers street, New York City.)



Infant's Folding Bath Tub

Activities of The Rubber Association of America.

ANNUAL SUMMER OUTING.

Preparation is being made for the annual summer outing of The Rubber Association of America, which will, if at all possible, be held during the week of July 25, probably Wednesday, the 28th, but the date and the location cannot yet be definitely announced, due to the unavoidable delay in the selection of an appropriate place. Consideration has been given to the Seaview Golf Club at Absecon, New Jersey, which was the location of the 1919 outing, but it is hoped that arrangements may be made for the outing to be held at an equally satisfactory place nearer New York and consequently more convenient to members in New England and in the Middle West. Definite information will be supplied to all members at the earliest possible moment concerning the details of the arrangements.

MEETINGS.

EXECUTIVE COMMITTEE, TIRE MANUFACTURERS' DIVISION.

The June regular meeting of the Executive Committee, Tire Manufacturers' Division, was held at the offices of The Rubber Association on June 16, and a considerable number of matters of a routine nature were given attention. Principal in interest was the subject of determining recommended minimum and maximum cross-section widths for pneumatic tires, as to which it was not found possible to reach a final understanding and the matter is still before the Committee.

EXECUTIVE COMMITTEE, MECHANICAL RUBBER GOODS MANUFACTURERS' DIVISION.

The Executive Committee, Mechanical Goods Division, held its June regular meeting at the Yale Club on Thursday, June 24, at which time several subjects of considerable interest were given attention, but none of the matters have progressed to the point at which definite advices may be promulgated.

SPECIFICATION COMMITTEE, MECHANICAL RUBBER GOODS MANUFACTURERS' DIVISION.

For the convenience of several members of the Specification Committee who wished to attend the convention of The American Society for Testing Materials at the New Monterey Hotel, Asbury Park, the June meeting of the Specification Committee was held at that place on June 23 and 24. As has become the habit of this Committee, a large docket of subjects was disposed of and substantial progress was made in the working out of the detail connected with the Committee's work in the direction of improving and standardizing specifications for mechanical rubber goods.

INDUSTRIAL RELATIONS EXECUTIVE COMMITTEE.

The Industrial Relations Executive Committee met at Boston, June 10, 11 and 12, at the invitation of the Hood Rubber Co., and very satisfactory progress was made on the development of several subjects now before the Committee, definite advices concerning which will be disseminated from time to time through the medium of circular letters and bulletins as the work on any subject is completed.

BULLETINS.

The bulletins issued frequently during the past month by the Association for the benefit of its members contained the following information of trade interest.

It appears from the conclusion reached by the Research Staff of the National Industrial Conference Board on the length of the work week, in its study of the hours of work problem in five major industries, that no single schedule of hours is equally adaptable for all industries from the standpoint of production. The evidence is overwhelming that maximum efficiency cannot be obtained in all industries with any single specific work-day. In general, the ability to increase hourly efficiency and thus make up, either wholly or in part, for reductions in hours is largely determined by the amount of handwork, as distinguished from automatic machine work, which is performed in any given process.

With regard to medical supervision in industry, the cost is not large, and the benefits derived far outmeasure the expenditure. A compilation of data submitted by forty-one industrial establishments with an aggregate of 223,416 employes showed that in 1915 the average annual cost per employe was $1.88. A later study covering the year 1916 and including ninety-five industrial establishments with a total of 479,634 persons indicated an average annual cost of $2.21 for each person employed.

A prominent construction company, employing several thousand men and operating in the New England and Middle Atlantic States, has for some time been making an interesting experiment in educating its employes regarding labor costs. Recognizing the value to its executive of graphs and diagrams as aids to effective visualization of the status of work on the various jobs upon which the company is engaged, the practice of preparing charts for the foremen and workmen was recently adopted. These charts are plotted week by week and show the unit costs of each class of work, as, for example, excavation, making up forms, erecting forms, placing reinforcement, pouring concrete, etc. In order to be available without difficulty the charts are posted in a weatherproof case on the outside of the field office.

HOURS IN RUBBER WORK-WEEK.

The following tabulation was compiled from the responses of 187 rubber manufacturers:

	Number of Plants.	Hours of Work per Week.
California	1	44
	2	48
Canada	1	50
Connecticut	1	45
	5	48
	1	49
	1	49½
	1	50
	1	55
Delaware	1	48
	1	54
Iowa	1	44
Illinois	1	47
	2	48
	4	50
	5	55
Indiana	1	55
Kansas	1	52½
Massachusetts	1	45
	1	47
	18	48
	1	49½
	4	50
	1	52
	1	54
Michigan	1	54
	1	55
Minnesota	1	55
Missouri	1	51
	1	55
Nebraska	1	50
New Jersey	1	47
	1	47¾
	6	48
	2	49½
	7	50
	1	50¼
	1	52
	9	55
New York	2	44
	8	48
	3	49
	1	49½
	5	50
	2	52
	1	55
	1	60
Ohio	1	44
	3	45
	1	45½
	1	47
	12	48
	1	49
	2	49½
	5	50
	1	52½
	18	55
	1	57
	1	65
Oregon	1	48
Wisconsin	1	49
	2	55
	1	56
Pennsylvania	2	48
	1	50
	2	52
	1	53
	2	54
	3	55
	1	55½
	1	56½
	1	59
	1	60
Rhode Island	3	48
	1	50
Washington	1	44¼

A NEW PRINCIPLE FOR WAGE INCREASES.

The Industrial Court in Great Britain in a recent decision lays down a new principle for determining claims for wage increases. Hitherto the awards of the Committee on Production, and subsequently of the Interim Court of Arbitration, have been accepted as standard; these provided for wage increases commensurate with cost of living increases. The decisions, as a rule, provided also for rehearings every four months, so that if the cost of living were found to have increased, an equivalent wage increase might be considered.

In its decision the Industrial Court states that no increase in wages is due as a result of increases in cost of living, but that the value of the work done must be the determining factor. The Court holds that: "The remuneration of the various classes of workpeople should, in ordinary circumstances, depend on the value of the work done, and the value of the work done depends upon the state of the market and the demand for the products of the workshop."

CANADIAN PARCEL POST REGULATIONS.

According to the customs regulations of Canada no goods exported to that country from the United States, whether sent by mail or otherwise, can be entered through the Canadian customs without certified invoices furnished by the exporter to the importer or his agent. The certified invoices must be furnished in triplicate, two copies being required for customs entry and the third for the use of the importer. The proper commercial designation of the goods must be set forth in all invoices. The invoices must show the marks and numbers on the packages, in such a manner as to indicate truly the quantities and values of the articles comprised in each package. Every invoice must contain a sufficient description of the goods, and in respect of goods sold by the exporter must show in one column the actual price at which the articles have been sold to the importer and in a separate column the fair market value of each article as sold for home consumption in the country of export. The "price" and "value" of the goods are to be stated as in condition packed ready for shipment at the time when and at the place whence the goods have been exported directly to Canada. But when the value of goods for duty purposes is determined by the Minister of Customs, the value so determined will be held to be the fair market value. The fact that packages of merchandise from the United States for Canada may be accompanied by customs declarations does not obviate the necessity for certified invoices being furnished by the exporter to the Canadian importer for use in making customs entry of the merchandise.

NEW TRADE PUBLICATIONS.

The Wellman-Seaver-Morgan Co., Cleveland, Ohio, issues a series of beautifully illustrated and remarkably clear "Bulletins," of which No. 48 deals with "Rubber Machinery." These bulletins show on one page a half-tone picture of a machine or installation, and on the page opposite a working blue-print giving the mechanical details. The rubber machinery includes the following: tire-applying press, rubber cracker and washer, rubber mixing mill, calender, rimming press, and hydraulic press vulcanizer. Other bulletins describe coal and ore handling machines, cranes, hydraulic turbines, hoisting and coke-oven machinery, and steel works and port and terminal equipment.

The Altenburg Tire Equipment Co., Davenport, Iowa, and Columbiana, Ohio, issues an extremely useful catalog of its products for the year 1920. The first half contains distinct pictures with detailed descriptions of all the machinery and tools used in tire repairing, while the last half conveys in clear language practical instruction, helped with many illustrations, in the modern methods of tire repairing.

"Miller Tire Trade News," the house organ of The Miller Rubber Co., Akron, Ohio, makes its first appearance with the June number. It is a lively little sheet, giving a lot of information about rubber, besides news of the company's activities that interests the general public as well as the employes.

"Converse Folks," the official factory magazine of the Converse Rubber Shoe Co., Malden, Massachusetts, to replace the "Triple Tread News," made its initial appearance June 1, 1920. It is to be published twice a month by a staff of Converse employes under the editorship of W. Sewall, and printed in the company's own printing plant. The first issue is a 40-page, well-illustrated paper of pocket size with a two-color cover. It contains much interesting factory news and many breezy personals, all well calculated to foster a feeling of cooperation, friendship, and loyalty throughout the Converse organization.

"The Wigwam," the house publication of The Spreckels "Savage" Tire Co., San Diego, California, is printed in Indian red, on cream-colored stock. Some of the departments are: "In Counsel with the Big Chief," "Factory Pow-Wow," "Squaw Squawks," "Savage Sports," "Many-Ha-Ha-Heap-Big Smileage Section," etc. The head of an Indian chief and a wigwam decorate the title-box on the front page.

The Cooper-Hewitt Electric Co., Hoboken, New Jersey, issues an artistic and expensive "Portfolio of Industrial Illumination," a large quarto pamphlet with 19 handsome illustrations, showing the light in operation in factory interiors. These include machine tool factories, motor works and cotton mills. The cover has a striking picture of the exterior of a mill lighted at night with the lights reflected in the waters of an adjacent pond.

The Northern Rubber Co., Limited, Guelph, Ontario, sends out its 1920-1921 catalog of "Partridge Rubber Footwear," profusely illustrated in color, showing its many lines of boots and shoes for lumbermen and fishermen, for sports and for city wear.

"Rubber," a handy little magazine of boiled-down information on rubber engineering and production, edited by Thomas P. Hallock and Charles C. Lynde (The Trade Press Co., Cleveland, Ohio), in the May number has an illustrated article by Mr. Lynde on overhead handling of tire molds, followed by other articles of rubber interest.

"The Stronghold," the new monthly publication of The Rubber Products Co., Barberton, Ohio, is given over chiefly to factory news and to matters of interest to the employes. It contains some clever verse.

In the April issue of the "Color Trade Journal" appears an article by Frederic Dannerth, Ph. D., entitled "Coal-Tar Products Used in Rubber Industry." Dr. Dannerth lists eleven different coal-tar products used in rubber manufacture, and then discusses at some length the following topics: Formation of colored diazo compounds in rubber mixings; thinners for rubber compounds; porosity correctives; a coagulant for rubber latex; accelerators of vulcanization; industrial research on accelerators; influence of amino accelerators on health; devulcanizing agents; reclaiming waste rubber; black pigment for coloring compounds, and softening waste rubber.

"Primrose," edited by P. Carel Wijnand, the first rubber periodical in Holland, bids farewell to its readers in the mid-April number, as it is obliged to suspend publication on account of the increased demands of compositors and printers for higher wages, as well as because of the high prices for paper and other materials. It has been a valuable, original, and artistic paper in the seven years of its existence.

The *Internationale Vereeniging voor de Rubber-Cultuur in Nederlandsch-Indie* (International Association for Rubber Growing in the Dutch East Indies), of Amsterdam, issues its sixth yearly report, for 1919, in Dutch and in English. Besides describing the activities of the society, the report discusses the labor difficulties in Java and Sumatra and the proposed export duty on rubber, and gives some interesting statistics on rubber production.

THE EDITOR'S BOOK TABLE.

"The Preparation and Vulcanization of Plantation Pará Rubber." (D. Van Nostrand Co., 25 Park Place, New York City.)

This encyclopedic collection of articles on rubber by B. J. Eaton, J. Grantham and F. W. Day, the practical chemists of the Agricultural Department of the Federated Malay States, is

becoming hard to get, as its value has been recognized by rubber men everywhere. The book was reviewed in The India Rubber World February 1, 1919; the substance of the information it contains has been noted in these columns as the articles first appeared.

CANADIAN TRADE INDEX, 1920-1921. (The Canadian Manufacturers' Association, Inc., Toronto, Canada.) (Cloth, large octavo, 10½ by 7 inches, 832 pages and map.)

This trade index, the only one of its kind for Canada, is divided into three parts, and in a limited number of copies into four. First comes an alphabetical list, giving the name and address of every manufacturer in the Dominion and comprising 9,500 firms. Next comes the classified list of Canadian manufactures, comprising 8,445 items, with the names of the manufacturers. Following is the list in the French language of all these manufactured articles, with references to the number under which the English information and the manufacturers' names appear. In the limited edition a similar list in Spanish follows the French catalog. An excellent, official map of the Dominion of Canada, showing the transportation facilities, the trade routes and the natural resources of the various districts, is enclosed. The index is indispensable to those who desire Canadian business.

INTERESTING LETTERS FROM OUR READERS.

EAST AFRICAN RUBBER POSSIBILITIES.

To the Editor:

Dear Sir:—At the present time, when there is such a large demand for rubber goods, it becomes a matter of paramount importance for those concerns engaged in the rubber industry to endeavor to obtain sufficient supplies of raw material in order to cope with the increasing demand for manufactured rubber goods.

The writer, who campaigned in German East Africa with a British native regiment, is of the opinion that the former German colony would make a valuable addition to the existing sources of crude rubber obtainable by American manufacturers. Already the vacated rubber plantations of former German owners have been taken up by other planters, and as the mandate given to Great Britain to govern this territory should not affect the "open door" policy in regard to trade and commerce with other countries, it should furnish the American rubber industry with the opportunity to tap these new resources and further increase the supply of crude material.

It was further noticed that a large amount of rubber was growing in Portuguese East Africa, especially in the Lugella district, where exceptionally large tracts were under rubber cultivation and which it is believed were owned by the Lugella Company. Large areas under rubber cultivation were also observed while passing through the territory administered by the Mozambique Company. Native labor is abundant and the cost on the plantations is of negligible importance, as in many cases natives are paid in calico and food.

The writer, who is not connected with the rubber industry in any way, is merely stating what he has seen in East Africa and would be satisfied if his observations may prove of more than passing interest to rubber manufacturers and possibly worthy of investigation. It would undoubtedly be a sound project for American manufacturers to get in touch with new planters in East Africa, more especially in the vast territory formerly known as German East Africa, and aggressive efforts ought to be made to obtain a portion of the rubber crops of that country as soon as they become ready for marketing.

John Nelson,
Ex-Sergeant, King's African Rifles.

Holyoke, Massachusetts.

IN MEMORY OF A GREAT FRENCH AVIATOR.

To the Editor:

Dear Sir: It is a year ago that the famous aviator, Jules Védrines, met his death in trying to accomplish his first voyage by airplane from Paris to Rome. He was popular throughout the world for his audacity, courage, and his exceptional qualities, and he was one of the most active and best mechanics in the victory of the air.

Jules Védrines has left his old mother, aged 71, his widow, and four children aged 10, 8, 7, and 5, and it is for their help that a committee has been formed which is patronized by members of the French Government and the notability of all the large nations, in order to provide for the needs of the family and to erect a monument in the place from which the celebrated aviator started his tragic flight.

The headquarters of the committee for subscriptions to the monument of Jules Védrines, is at 93 boulevard Beaumarchais, Paris. The subscriptions are to be addressed to the treasurer, Monsieur Georges Labastie, 7 Place de la Bastille (Paris IV–), France.

Comité de Souscription au Monument à la Mémoire de l'Aviateur Jules Védrines.

THE OBITUARY RECORD.

FOUNDER OF THE McGRAW TIRE & RUBBER CO.

Edwin C. McGraw, founder and for ten years president of The McGraw Tire & Rubber Co. of Cleveland and East Palestine, Ohio, died at his southern home, Point View, Miami, Florida, on May 24, after an illness of several months. Mr. McGraw was born in Pittsburgh, Pennsylvania, in 1858, and became a member of the firm of J. A. McGraw Brothers, who were pioneers in the rubber roofing business, at the age of 23, engaging in brick making and the real estate and hotel business.

Edwin C. McGraw.

In 1908 he secured the patent rights in the "vertical fabric thread tire," and in the following year decided to build a tire plant at East Palestine. This started by making eight tires a day; by 1919 its output was 5,000 tires and 6,000 tubes daily. It now manufactures only high grade tires, the McGraw fabric, cord and solid tires with the 5,000 mile guaranty. Mr. McGraw was also president of the Fidelity Trust & Mortgage Co. and a director of the Fidelity Bank and Trust Co. of Miami. He leaves his widow, a son, R. W. McGraw, and a daughter, Mrs. John Morgan, and also one brother, G. W. McGraw, Jr.

ERECTING ENGINEER FOR HUNTER DRY KILN CO.

Robert I. Monroe, erecting engineer for The Hunter Dry Kiln Co., Indianapolis, Indiana, died suddenly of heart disease Saturday, June 19, 1920, at his home in Indianapolis. Mr. Monroe became associated with the Hunter Dry Kiln Company shortly after its incorporation and, acting in the capacity of erecting engineer, had occasion to visit many of the well-known rubber

factories where he made numerous warm friends who appreciated his trustworthiness and strong personality. Mr. Monroe was thirty-seven years of age. His widow and four children survive him.

WAS NOT A CHRONOLOGICAL REFERENCE.

Our good friend, the learned editor of the *"Bulletin de l'Association des Planteurs de Caoutchouc,"* thus comments upon a recent article:

"The very distinguished director of The India Rubber World, Mr. Henry C. Pearson, in telling the history of plantation rubber in the December number of that review writes: 'When the automobile industry entered on its glorious career, the demand for rubber was such that it rose from its normal price of $1.25 to $3.00 a pound. The dividends thus obtained from the rubber estates—200 and 300 per cent—excited the British capitalists, then in a less degree the Dutch and the Belgians, and the "Rubber Fever" began.' Our estimable confrère rather mixes up dates. In our pamphlet, 'Les intérêts Belges dans les Sociétés de Caoutchouc en Malaisie et au Congo,' published at the end of 1919, we told that the Belgians had become interested in rubber plantations as early as 1887 by creating the syndicate of Malaysia. All this before the 'Rubber Craze' of which Mr. Pearson speaks."

We hasten to acknowledge that our friendly critic is right regarding the early appreciation on the part of the Belgians of the value of *Hevea* planting in the Far East. It was not the intention to seem to contradict this. The point was that the majority of the plantations installed during the rubber craze were financed by the British. To this we believe our amiable confrère will agree. (THE EDITOR.)

DETERMINATION OF THE SOFTENING OF PLASTIC MATERIALS.[1]

IT HAS long been customary to compare plastic materials by such tests as melting point, twisting point, penetration, etc. These tests are valuable, but are not easily reproduceable and do not give any indication of the various changes taking place under heat. It is for this reason that the following method has been adopted.

The instrument used for carrying out this test was the Widney Resiliometer, illustrated in Fig. 1, which was adapted so that with a presser foot, C, of ⅛-inch diameter, the weight, I, gave a pressure of 200 pounds per square inch. The metal base, D, was replaced by ebonite, in order that loss of heat through conduction should be as little as possible. The large dial, A, is graduated in 100 divisions, each 1/1000-inch, so that one revolution of the larger pointer or hand is equivalent to an elevation of 1/10-inch travel by the presser foot. When the material is more than 1/10-inch thick the hand will revolve more than once around the dial, the number of revolutions being indicated on the small dial B.

The operations are as follows: the thickness is first determined by placing the sample between C and D, the normal thickness being read off on the dial. The spring-catch, E, is now released, holding the weight, I, and the quadrant, F, allowed to swing until the pressure is put on the upper end of presser foot, G, at the top of dial. This forces the foot into the material until it reaches the limits of compression as the result of the weight applied. The reading on the dial at that time is taken and compared with the normal or original thickness. For example, a sample having a normal thickness of 100 mils. (one mil. = 1/1000-inch) gave a reading at 200 pounds per square inch of 25, namely at this pressure the material would show a compression of 25 per cent.

A sample of convenient size for testing is 2.5-inches by 0.5-inch by 0.100-inch thick and is easily obtainable by aid of a small mold, the shape of the sample permitting several tests to be determined throughout its length.

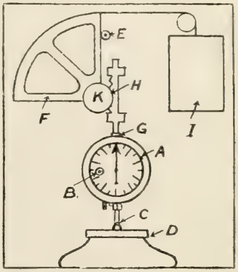


FIG. 1.

A, DIAL. B, REVOLUTION COUNTING DIAL. C, PRESSER FOOT. D, BASE. E, SPRING CATCH. F, QUADRANT. G, UPPER END OF PRESSER FOOT. H, TRANSMISSION PLUNGER. I, WEIGHT. K, TOOTHED PIVOT.

"SOFTENING" THE TEST PIECE.

The test piece, which should be molded about twelve hours before testing, is placed in water at 60 degrees F. or lower, depending on the sample, and maintained at the required temperature for a few minutes to ensure that the sample is uniformly heated throughout. It is then quickly taken out, its compression taken and replaced in the bath, the temperature of which is then raised at the rate of about 4 degrees F. a minute to the next reading, the sample being tested at every 10 degrees F.

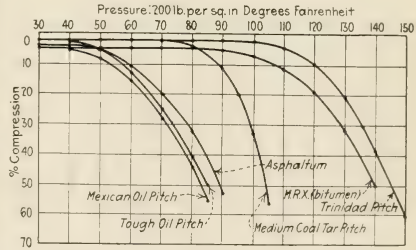


FIG. 2.

GRAPH SHOWING INFLUENCE OF TEMPERATURE ON COMPRESSION ON VARIOUS PITCHES.

When dealing with complex substances which have no definite constant, the value of these curves will be at once apparent. The author has found the curves most instructive and of great assistance in controlling running batches of material.

THE MERCHANTS' ASSOCIATION ELECTS NEW MEMBERS.

The Merchants' Association, New York City, on June 21, 1920, elected to membership the following individuals of interest to the rubber and allied trades: Edward C. Beard, 106 Duane street, New York City, assistant treasurer of The Beacon Falls Rubber Shoe Co., Inc., Beacon Falls, Connecticut; Frank Waldo, E. M. and F. Waldo, 11 Broadway, New York City, manufacturers and importers of dry colors for the rubber and allied trades; B. L. Atwater, 1889 Metropolitan avenue, Brooklyn, New York, vice-president of William Wrigley, Jr., Co., Brooklyn, chewing gum manufacturer.

[1] "The Softening of Plastic Materials Determined by the Widney Resiliometer and Expressed Graphically." By Alan Speedy. "Journal of the Society of Chemical Industry," January 31, 1920.

STORAGE BATTERY DEVELOPMENT ON THE PACIFIC SLOPE.

Special Correspondence

Just as the rapid and extensive distribution of automobiles on the Pacific Coast has within a few years resulted in the establishment in this section of branch factories to supply the urgent demand for cars, and has latterly stimulated the interest of enterprising tire makers in the trade possibilities of the Coast, with the resultant creation of an industry here that has already assumed huge proportions, so the widespread and ever-increasing use of motor cars in the territory between the Rockies and the western boundary of the United States has proved a powerful spur to the sale and production in this section of that automobile essential—the hard, rubber-celled storage battery.

Up to within a comparatively recent date, all the batteries used on cars west of the Rockies came from the East and Mid-West; but now, while the older companies, through about 250 well-equipped service and replacement stations on the Coast, are holding their own very well, considerable inroads are being made into the field by some ten aggressive concerns that started here but a short time ago to manufacture electrical accumulators, many of the latter comparing well in efficiency with the products of the bigger and older factories nearer the Atlantic seaboard. Not only do these "youngsters" expect to get a considerable share of the Coast business, but they are also contending for a fair portion of the $120,000,000 worth of battery replacements which, it is estimated, will be the nation's need in 1920.

Some idea of the opportunities for battery men on the Coast may be gleaned from the fact that on December 31, 1919, there were registered in California 493,463 automobiles (including trucks), in Oregon 83,332, and in Washington 164,080; or a total of 740,875 for the states bordering the Pacific. But as the Pacific coast territory is ordinarily held to includes all the states quite west of the Rockies, Idaho should be added with 42,271, Nevada with 9,305, Arizona with 28,979, and Utah with 34,749; or a total for those four states of 115,304, which, added to the 740,875 in the first three states named, would make a grand total of 856,179 automobiles registered at the beginning of this year in the Pacific slope states. Experts in the trade figure that there has been an increase of at least 10 per cent since the date given, which would bring the total number of motor cars now in use in the territory named up to 941,747, as compared with an estimated present total in the entire United States of fully 8,000,000, the actual registration on March 1, 1920, having been computed by the Automobile Club of Southern California as being 7,718,020.

It might be added that no small impetus has been given to the storage battery business on the Pacific slope, as well as throughout the entire country, by the decision of the makers of the most popular low-priced cars in the United States to add to their 1920 models a complete electric lighting and starting equipment, and that new laws in many of the states now insist on motorists having lights that can be given efficiently only by means of storage batteries.

But storage batteries are used not only for lighting, starting, and ignition on gasoline automobiles. They are needed in ever-increasing quantities for propeling and lighting electric motor cars, for lighting and starting airplanes, launches, and fishing boats, for isolated house-lighting stations, for steam railroad switchwork and signaling (two being used on every block tower), for lighting steam railroad trains, for lighting street railway cars and for propulsion on many lines, for lighting ocean-going ships, for operating railroad and other draw-bridges, for numerous submarine boat needs, for starting and igniting stationary gas engines, for fire alarm service, for mine locomotives, for mine-workers' headlights, for blasting, and in radio and telephone work. So, too, are "stand-by" and "booster" storage batteries largely used in electric power and lighting stations for regulating the load, absorbing the surplus production of current when the demand is light and releasing it when the demand is extra heavy, for equalizing momentary fluctuations due to irregular running of generators, for regulating voltage in certain classes of service, for controlling current supply on long feeders of street railway lines, and for emergency service, providing, as it were, a reservoir of energy to avert a complete shut-down of a station in the event of accident. One of the many recent minor applications of a storage battery is in connection with the propulsion of row-boats, the small gasoline engines much used for that purpose being supplanted by electric batteries.

Not content with merely merchandising and supplying service, the leading manufacturers of storage batteries on the Coast are carrying on considerable research work which they believe will result in increased efficiency and greater usefulness of an electrical device that is second in importance only to the dynamo itself, and that has even a much larger range of utility than the electrical generator to which it is invariably linked. Having made the hard rubber cells quite as light as the inclosing wooden case, they are now trying to reduce the weight of the lead plates and to reduce the bulk of the acid fluid or electrolyte without lessening the amperage or current quantity to make the perforated hard rubber separators used between the plates in certain types of batteries even more "porous" without loss in rigidity, to automatically check overcharge and overheating; and particularly are the experimenters endeavoring to overcome one of the greatest drawbacks of the storage battery—the long period of charging cells at stations, usually averaging from twelve to sixteen hours, and which period is always in direct ratio to the swiftness with which the battery has been discharged.

LIGHT AND CALCINED MAGNESIA.

Magnesia is an ingredient very commonly used in vulcanization, where it acts as the best mineral accelerator. It comes in two forms, light and calcined. These varieties in the dry state have very different volumes, but their specific gravities determined in paraffine oil are practically the same. The greater relative volume of light magnesia is not due to a finer state of pulverization than that of heavy magnesia. Its greater volume and apparent lighter gravity is due to its special structure which is little known to rubber workers and upon which too much emphasis cannot be placed, as all the qualities of the light form of magnesia are dependent on this particular feature of its structure.

To give a simple idea of the difference existing between two materials of different volumes, conceive one as a sphere and the other as a cylinder. A thousand spheres will occupy in any receptacle less space than a thousand cylinders of identically the same volume. One may thus liken a molecule of heavy magnesia to a sphere and a molecule of light magnesia to a cylinder. If these spheres and cylinders are placed in paraffine oil they will displace equal volumes. Thus, 100 grams of light magnesia occupies 763, cc. in a graduated flask while 100 grams of heavy magnesia occupies only 141 cc. If of two graduated flasks, each containing 100 cc. of paraffine oil, one adds equal weights of light magnesia to one and heavy magnesia to the other, then heats the flasks till all the air adhering to the particles of the magnesia has been expelled, it will be found on cooling that in the flask containing the heavy magnesia the volume occupied by the oxide is 129 cc. and in that containing the light magnesia the volume occupied by the oxide is 131 cc. Both volumes are practically the same and the marked difference of apparent volumes which exists between the two magnesias is due entirely to the occluded air which is different for each one.

The automobile business in British Malaya is largely in American hands. Large stocks of parts and tires are kept and one firm maintains repair shops and sales rooms in Singapore, Kuala Lumpur, Ipoh and Penang.

News of the American Rubber Industry.

DIVIDENDS.

The American Chicle Co., New York City, has declared its regular quarterly dividend of one and one-half per cent, payable July 1, on preferred stock of record June 19, 1920.

The American Zinc, Lead & Smelting Co., New York City and St. Louis, Missouri, has declared a dividend of $1.50 per share, payable August 2 on preferred stock of record July 15, 1920.

The Apsley Rubber Co., Hudson, Massachusetts, has declared its semi-annual dividend of three and one-half per cent, payable July 1 on preferred stock of record June 26, 1920.

The Brunswick-Balke-Collender Co., Chicago, Illinois, has declared its quarterly dividend of one and three-quarters per cent, payable July 1 on preferred stock of record June 20, 1920.

E. I. du Pont de Nemours & Co. (incorporated), Wilmington, Delaware, has declared a dividend of one and one-half per cent on its debenture stock, payable July 20 on stock of record July 10; also a quarterly dividend of four and one-half per cent and a stock dividend of $2.50 a share, both payable June 15 on stock of record May 28, 1920.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, has declared a quarterly dividend of 75 cents per share on its stock which has a par value of $25, payable July 1 on stock of record June 15. This is the second dividend, the first having been paid three months ago. The company has also declared a quarterly dividend of $1.75 a share, payable July 1 on first preferred stock of record June 15, 1920.

The Globe Rubber Tire Manufacturing Co., New York City, has declared a stock dividend of 10 per cent, payable July 1 on stock of record June 30, 1920, being the second 10 per cent stock dividend declared this year.

The Goodyear Tire & Rubber Co., Akron, Ohio, has declared a stock dividend of 150 per cent, to be paid from an accumulated surplus of $43,000,000.

The Habirshaw Electric Cable Co., Inc., Yonkers, New York, has declared a quarterly dividend of 37½ cents on outstanding stock of no par value, payable July 1 on stock of record June 20, 1920.

The Kelly-Springfield Tire Co., New York City, has declared a quarterly dividend of $1.50 per share, payable July 1 on its six per cent preferred stock of record June 15, 1920.

The Keystone Tire & Rubber Co., Inc., New York City, has declared its quarterly dividend of three per cent, payable July 1 on stock of record June 15, 1920.

The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio, has declared a quarterly dividend of one and three-quarters per cent, payable July 1 on preferred stock of record June 20, 1920.

The Madison Tire & Rubber Co., Inc., New York City and Buffalo, New York, has declared dividend No. 3, of 2 per cent, payable July 1 on preferred stock of record June 25, 1920.

The Martin Tire Corporation, 903 Sixth avenue, New York City, formerly The Triplex Tire Corporation, on March 10, 1920, declared a four per cent semi-annual dividend, payable March 20.

The Pennsylvania Rubber Co., Jeannette, Pennsylvania, has declared dividends of one and three-quarters and one and one-half per cent, respectively, on preferred and common stock of record June 15, payable June 30, 1920.

The Salmon Falls Manufacturing Co., Boston, Massachusetts, declared a quarterly dividend of two and one-half per cent, payable June 1 on stock of record May 17, 1920.

The United Shoe Machinery Corporation, Boston, Massachusetts, has declared the following dividends: one and one-half per cent on preferred capital stock; $1.50 per share on common 1920.

FINANCIAL NOTES.

The following financial statement of The Mason Tire & Rubber Co., Kent, Ohio, reflects the absorption of The Mason Cotton Fabrics Co., and the profit and loss statement shows net profits for the six months, amounting to $689,000, that are three times as great as for the entire preceding twelve months.

Earnings of the newly-acquired textile division do not show as heavily as they will later in the year as that division has been in operation only a short time.

Balance Sheet, April 30, 1920.

Assets.

Current:			
Cash balances		$803,919.58	
Accounts and notes receivable, mdse.	$998,776.56		
Less reserves	50,739.94		
		948,036.62	
Accounts receivable, stock		85,112.00	
			$1,837,068.20
Inventories:			
Finished goods at factory and branches		$1,065,499.11	
Work in process		109,773.84	
Raw material and supplies		1,070,381.07	
			2,245,654.02
Miscellaneous investments			104,500.00
Fixed:			
Real estate, buildings, etc		$1,193,941.35	
Machinery and equipment		1,253,466.67	
Total		$2,447,408.02	
Less reserves for depreciation		92,339.50	
			2,355,068.52
Deferred charges:			
Miscellaneous			133,826.59
Good will, trade marks, etc		$2,169,121.84	
Less capital surplus		840,463.75	
			1,328,658.09
			$8,004,775.42

Liabilities and Capital.

Current:			
Accounts and bills payable		$405,228.17	
Accrued taxes and expenses		50,098.64	
			$455,326.81
7% serial gold notes			750,000.00
Reserves:			
For income taxes		$19,651.30	
For tire adjustments		76,193.11	
Miscellaneous		22,924.78	
			118,769.19
Capital:			
7% preferred stock		$5,185,620.00	
Common stock "A"		500,000.00	
Common stock "B"		343,521.25	
			6,029,141.25
Surplus:			
Auditor's balance November 1, 1919		$45,671.51	
Income tax and other adjustments		32,581.57	
Profits for half year		689,479.02	
Total		$767,732.10	
Less dividends	$102,181.11		
Less adjustments	13,712.82		
		116,193.93	
			651,538.17
			$8,004,775.42

Contingent liability on trade acceptances discounted $1,254,713.85.

Profit and Loss Statement, Six Months Ended April 30, 1920.

Gross sales for period	$3,454,586.89
Less discounts, returns and corrections	425,121.08
Net sales	$3,029,465.81
Less cost of goods sold	2,013,350.35
Gross profit	$1,016,115.46
Less selling and administrative expenses	554,567.08
Tire division, net profit	$461,548.38
Textile division, profit, material sales	227,930.64
Total net profits for six months	$689,479.02

The General Electric Co., Schenectady, New York, at a special meeting of its stockholders, voted to increase the capital stock from $125,000,000 to $175,000,000 in order to obtain additional working capital from time to time.

The Goodyear Tire & Rubber Co., Akron, Ohio, has offered $20,000,000 seven per cent cumulative preferred stock and $10,000,000 common stock. With this new financing the company will have outstanding $66,844,100 of preferred and $61,890,000 of common stock. The total net assets of the company from the balance sheet as of April 30, 1920, amounted to more than $115,000,000. The good will, patents, trade rights and trade names are capitalized at $1, although the management believes that these are the most valuable assets of the company. Business for the six months to May 1, 1920, exceeded that of the preceding fiscal year for the same period by 59.3 per cent. An estimate based on six months' operation indicates net earnings for fiscal year ended October 30, 1920, approximating $30,000,000. Total business for this year will approximate $225,000,000 as compared with $168,000,000 in the preceding fiscal year.

The American Rubber & Tire Co., Akron, Ohio, has announced the issuance of $600,000 worth of preferred stock to provide capital for expansion.

The Fisk Rubber Co. has already earned two-thirds as much as for all of 1919 and by midsummer will probably have passed the $5,000,000 mark.

The Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, has issued its annual report for the year ended March 31, 1920. The gross earnings show sales billed amounting to $136,052,091.63 with a net manufacturing profit of $15,079,830.10, while the net income available for dividends and other purposes amounts to $15,206,341.27. The surplus for the year was $43,435,763.55, being an increase of $7,488,031.25 over the surplus for the year before. Dividends at the rate of eight per cent per annum were declared quarterly throughout the year.

The New Jersey Zinc Co., Inc., New York City, a New Jersey corporation, has filed with the Secretary of State at Trenton a certificate increasing its capital stock from $35,000,000 to $50,000,000, consisting of 500,000 shares at $100 par value.

NEW INCORPORATIONS.

Ackurate Rubber Co., Inc., June 5 (New Jersey), $100,000. C. V. Ackerman, 85 Clinton avenue; J. Swenson, 664 Main avenue; J. S. Swenson, 189 Madison avenue—all of Clifton, New Jersey. Principal office, 85 Clinton avenue, Clifton, New Jersey. Agent in charge, C. V. Ackerman. To manufacture, buy and sell tape, wrappings, etc., for insulating purposes, and rubber compounds and substitutes.

Acme Auto Supply Co., Inc., June 10 (New York), $5,000. M. Trachtenberg, 237 South Second street, Brooklyn; H. and E. Weinstein, both of 102 Chambers street, New York City, both in New York. To do auto tire business.

Allweather Top & Body Co., Inc., The, March 17 (New York), $500,000. J. W. Hayes, president and general manager; H. Anderson, vice-president; C. E. Mellen, secretary; F. Caley, treasurer; A. R. Davis, director. Principal office, 6545 Carnegie avenue, Cleveland, Ohio. To manufacture "All-weather" auto tops.

Ambuhl-Teitsch-Chofflet Rubber Co., Inc., June 11 (New York), $3,000. R. Ambuhl, 40 Spring avenue; M. Teitsch, 470 Second street, both of Troy; A. Chofflet, Green Island—both in New York. Principal office, Green Island, New York. To manufacture rubber tires and rubber goods.

Anheir Rubber Co., May 27 (Delaware), $500,000. R. Thistle; A. R. Myers; R. J. Gorman—all of New York.

B. B. Truck Tire Corp., June 11 (New York), $25,000. E. Page; M. Meggers; D. J. Fitzsimons—all of 777 Bedford avenue, Brooklyn, New York. Principal office, Brooklyn, New York.

Bergen Rubber Co., May 14 (New Jersey), $100,000. C. F. Teigeler, president; J. R. Flanagan, vice-president and sales manager; A. J. Teigeler, secretary; H. L. Teigeler, treasurer. Principal office, 42 Paterson avenue, East Rutherford, New Jersey. To manufacture inner tubes.

Common-Sense Suspender Co., Inc., June 2 (New York), $15,000. L. B. Keegan; T. Arter; E. M. St. John—all of Ithaca, New York. Principal office, Ithaca, New York. To manufacture elastic goods.

Consolidated Rubber Corp., May 24 (New York), $5,000,000. R. B. and E. W. Whiting; J. P. Stang—all of Pittsburgh, Pennsylvania.

Cord Tire Corp., May 12 (Delaware), $1,000,000. T. L. Croteau; M. A. Bruce; S. E. Dill—all of Wilmington, Delaware. To deal in crude and manufactured rubber and articles made of rubber.

Corkhill-Falk Co., Inc., May 20 (New York), $10,000. S. A. and G. H. Corkhill, both of 185 Raines Park; B. Falk, 238 Alameda street—both of Rochester, New York. Principal office, Rochester, New York. To do an auto tire business.

DuBois Rubber & Tube Co., February 5 (Tennessee), $100,000. J. D. Du Bois, president; L. H. Lightfoot, vice-president; P. B. Whitaker, secretary and treasurer; M. N. Whitaker, J. A. Stith, directors. Principal office, 315 Volunteer State Life Building, Chattanooga, Tennessee. To manufacture a compression inner tube, also automobile casings.

Empire Rubber Products Corp., May 24 (New York), $250,000. F. R. Hansell; J. V. Pimm; E. M. MacFarland—all of Philadelphia, Pennsylvania. To manufacture tires and tubes.

Eureka Tire Rebuilding Co., The, June 9 (New Jersey), $150,000. H. C. Ferry; I. G. Mercer, both of 327 Paulison avenue; J. Doremus, 170 Bloomfield avenue—both of Passaic, New Jersey. Principal office, 20 Howe avenue, Passaic, New Jersey. Agent in charge, H. C. Ferry. To manufacture, repair, rebuild tires and all other rubber goods.

Goddard Rubber Co., March 24 (Wisconsin), $10,000. D. W. E., D. C., S. H. Goddard. Principal office, Watertown, Wisconsin. To manufacture, buy and sell all kinds of rubber or composition goods.

Harloe Tire Co., May 21 (Delaware), $500,000. N. Butler, Wilmington, Delaware; M. Harloe, Winchester; N. King, Clifton Station, both in Virginia. To manufacture automobile tires.

India Tire Co., May 18 (Missouri), $100,000. F. E. McLarty, president; G. T. Lownsbery, vice-president; H. Holzhauer, vice-president; W. E. Brown, secretary and treasurer. Offices at Kansas City, Missouri, and Dallas, Texas. To distribute India tires and tubes.

Kleistone Rubber Co., Inc., April 12 (Massachusetts), $200,000. G. Marsh; M. E. Buchanan, both of 55 Congress street; E. H. Bell, 31 State street—both in Boston, Massachusetts. Principal office, Boston, Massachusetts. To manufacture and deal in boots, shoes, rubbers, soles, heels and other parts of rubber boots and shoes, together with articles of any kind made wholly or partially of rubber.

Leatherman Tire & Rubber Co., March 19 (Washington), $2,000,000. R. H. Huntoon, Seattle, Washington. Principal office, Seattle, Washington. To manufacture, buy, sell, import, export and generally deal in rubber and all goods of which rubber forms a part.

Lehigh Tire & Supply Corp., June 3 (New York), $1,000. W. C. Murphy; D. C. Brewster; H. S. Evans—all of 40 Cedar street, New York City. Principal office, Brooklyn, New York. To deal in tires and auto supplies.

Long Island Tire Co. of New York, Inc., June 12 (New York), $10,000. A. Samuels, 121 Ellery street; I. Betchley, 692 Hancock street; M. Hershkowitz, 61 Stuyvesant avenue—all of Brooklyn, New York. Principal office, Brooklyn, New York. To manufacture tires.

Lorimer Manufacturing Co., Inc., April 13 (New York), $3,000. A. Levy; P. Smolan; C. Bennitt—all of 111 Broadway, New York City. To manufacture articles of glass, amber, ivory, celluloid, rubber, etc.

Majestic Sales Corp., June 19 (New York), $10,000. R. H. Syfers; E. B. Oscars, both of Indianapolis, Indiana; G. W. Chapman, Woodward Hotel, New York City. To manufacture tires and rubber goods.

Manhattan Garter Co., Inc., June 11 (New York), $20,000. N. and G. Englehardt, both of 2116 84th street, Brooklyn, New York; M. Kirschenbaum, Elizabethport, New Jersey. To manufacture garters, suspenders, etc.

McWade Tire & Rubber Co., The, March 31 (Ohio), $5,000,000. J. H. McWade, president; C. C. Cox, vice-president; H. G. Vincent, secretary and treasurer. Principal office, Garrettsville, Ohio. To manufacture casings and tubes.

Page Truck Tire Corp., June 14 (New York), $25,000. E. Page; M. Meggers; D. J. Fitzsimons—all of 777 Bedford avenue, Brooklyn, New York. Principal office, Brooklyn, New York. To manufacture auto tires.

Passaic Rubber Co., May 6 (New Jersey), $100,000. H. C. Mathey; J. W. Partington; W. Greengrass—all of Passaic, New Jersey. Principal office, 625 Main avenue, Passaic, New Jersey. Agent in charge, W. Greengrass. To buy, sell and manufacture mechanical rubber goods and insulating tapes, of every kind and description.

Philadelphia Insulated Wire Co., April 29 (Pennsylvania), $250,000. T. R. Topley, Llanerch; W. Lilley; E. Kippak; both of Philadelphia—both in Pennsylvania. Principal office, Philadelphia, Pennsylvania. To manufacture insulated wire.

Quality Rubber Co., March 27 (New Jersey), $20,000. M. Mandel; R. Studt; L. Kozma; S. Mandel; S. C. VanCleef—all of New Brunswick, New Jersey. Agent in charge, S. C. VanCleef. To manufacture, buy, sell, produce and deal in crude, refined and manufactured rubber, gutta percha, chicle, Pará and other gums, etc.

Queens Scrap Rubber Co., Inc., June 10 (New York), $10,000. N. Keddel, 706 Riverside Drive; F. Fischer, 309 Broadway; R. Forman, 145 West 117th street—all in New York City. To manufacture scrap rubber and tires.

Royal Tire & Rubber Co., May 25 (Massachusetts), $50,000. L. S. Taylor, Lynnfield; J. L. Layne, 16 March avenue, West Roxbury; W. G. Burns, 80 Columbia Road, Dorchester—all in Massachusetts. Principal office, Boston, Massachusetts. To manufacture and deal in tires for automobiles.

Simonsen-Denker, Inc., June 1 (New York), $10,000. P. H. Simonsen, president; H. A. Vieu, vice-president; W. L. Denker, secretary and treasurer. Principal office, 561 Washington street, New York City. To sell Republic tires.

Standard Tire Stores Co., Inc., June 4 (New York), $200,000. M. Cohen, 1845 Seventh avenue; A. Jaffe, 2126 Vyse avenue; J. Nemerow, 362 Fifth avenue—all of New York City.

Sullivan & Sons Shoe Co., J. E., May 6 (New Jersey), $500,000. C. R. Allen; E. M. Hudson; I. M. Strang—all of 317 Market street, Camden, New Jersey. Principal office, 317 Market street, Camden, New Jersey. To manufacture, buy, sell boots, shoes, rubbers, etc.

Superior Vulcanizing Works, Inc., June 16 (New York), $12,000. C. H. May, 1530 Main street; H. Groegor, 1526 Main street; J. A. Christian, 206 Oxford avenue—all of Buffalo, New York. Principal office, Buffalo, New York. To do tire repair work, etc.

Tire Mould Corp., May 22 (New York), $20,000. S. I. Prager, 100 St. Nicholas avenue; J. A. Strauss, 522 West 157th street, both of New York City; R. R. Garfield, 2950 West 32nd street, Brooklyn, both in New York. To manufacture tires and tire moulds.

Tire Rebuilding Co., Inc., May 28 (New Jersey), $50,000. C. P. Kunzmann, president; E. J. Fendl, secretary and treasurer. Principal office, 1110 Elizabeth avenue, Elizabeth, New Jersey. To rebuild, vulcanize and repair tires and tubes.

United Tire Stores Co., May 5 (New Jersey), authorized capital stock of 50,000 shares without any stated or par value. Isaac, Hermand and Samuel Fineburg; A. F. Jemison—all of Trenton, New Jersey. Principal office, 10 East Hanover street, Trenton, New Jersey. Agent in charge, H. Fineburg. To import, buy, sell and deal in automobiles, bicycles, motorcycles, etc.

Usona Tire Corp., May 29 (New York), $75,000. S. Jacobs, 540 West 159th street, New York City; B. Levy, 234 Pulaski street; B. Swiryn, 892 Dekalb avenue, both of Brooklyn—both in New York. To manufacture tires.

Usow Rubber & Mfg. Co., February 11 (Wisconsin), $100,000. A. D., J. and J. J. Usow—all of Port Washington, Wisconsin. Principal office,

Port Washington, Wisconsin. To rubberize fabrics and to manufacture rubber cement.

Vacuum Rubber Heel Corp., May 24 (New York), $50,000. M. Dusel, 45 Gesl street; F. X. Muller, 26 Lyth street; E. J. Whissel, 685 Utica street—all of Buffalo, New York. Principal office, Buffalo, N. Y.

Vulcweld Tire & Rubber Co., April 19 (Pennsylvania), $100,000. W. C. Walsh, president and purchasing agent; E. W. Potteiger, vice-president; J. A. Maney, secretary; E. Smith, treasurer. Principal office, Pottstown, Pennsylvania. To rebuild tires.

Wadsworth Sales Co., Inc., May 28 (New York), $20,000. E. J. Wadsworth, president; W. T. Leonard, vice-president; W. J. McDonald, treasurer; P. F. Acer, secretary. Principal office, 16 Court street, Brooklyn, New York. To distribute automobile tires, tubes and accessories.

Warner-Johnson Tire Co., The, April 15 (Ohio), $15,000. S. B. Warner, president; W. T. Richards, vice-president; C. E. Lytle, secretary; S. E. Johnson, treasurer; W. H. Johnson, general manager. Principal office, Canton, Ohio. To distribute Pennsylvania Vacuum cup tires.

Weartex Rubber Co., March 31 (Pennsylvania), $25,000. E. J. Hugo; G. R. Saleman, both of Philadelphia; I. Schulhoff, Uniontown—both in Pennsylvania.

Youngstown Rubber Products Co., The, April 3 (Ohio), $10,000. J. T. Harrington; U. C. Deford; J. P. Huxley; N. A. Emery; D. J. Lynn. Principal office, 617 Market street, Youngstown, Ohio. To distribute tires, etc.

Zeglen Tire & Rubber Co., Inc., January 16 (Illinois), $500,000. J. P. Drish, acting president and vice-president; F. J. Kolodzinski, secretary and treasurer. Principal office, 706 Oxford Building, 118 North La Salle street, Chicago, Illinois. To manufacture tires.

A SUCCESSFUL ORGANIZER OF RUBBER COMPANIES.

William Wallace Wildman, the well-known organizer and manager of successful rubber companies, was born in Zanesville, Ohio, February 11, 1872. During his youth in Zanesville he attended the common and high schools, and after leaving school he worked in his father's furniture store. Later he became a member of the firm of J. B. Wildman & Sons. In 1891 he moved to Chicago, and was for six months in the wholesale house of Marshall Field & Co. His next connection was with the National Tube Works in Chicago until that company was consolidated with the Crane Company. He then went with James B. Clow & Sons in the same line of business, and remained with that firm for five years.

William W. Wildman.

In 1897 Mr. Wildman entered the rubber field, joining the firm of Morgan & Wright as assistant superintendent of the mechanical rubber goods department in the Chicago factory. Three and a half years later he took charge of the sales of mechanical rubber goods, the compilation of catalogs, and the training of traveling salesmen in those lines. He was employed in that capacity for about four and a half years. When Morgan & Wright were then taken over by the Rubber Goods Manufacturing Company, Mr. Wildman resigned and went with the Milwaukee Rubber Works Co. When that company became involved in financial difficulties he conducted the business under the receivership for two years. After the first three months he made money for the company, and later organized the Federal Rubber Co., which purchased the assets of the old concern. Mr. Wildman was made general manager of the Federal company. After the plant had been in operation about a year he resigned and went to Akron.

Having developed and perfected a patented process for devulcanizing rubber scrap, he organized at Akron, in 1908, the United Rubber Co., which bought the plant of the old Aladdin Rubber Co., located in West Barberton, for the purpose of manufacturing reclaimed rubber.

When Mr. Wildman engaged in rubber reclaiming it was with the idea that as soon as the business was firmly established a larger and separate company should be formed for the manufacture of rubber goods. Thus he brought about the incorporation of The Portage Rubber Co. in 1910. Mr. Wildman was general manager from the start and subsequently was chosen president. He remained with the company until the fall of 1919, when he resigned and formed the Wildman Rubber Co. of Detroit, of which he is president. It is capitalized at $10,000,000, and is building a big plant at Bay City, Michigan, preparing to turn out 2,500 tires and 5,000 tubes a day.

Mr. Wildman is a 32nd-degree Mason, resides in Detroit and is a member of the Akron and Barberton Chambers of Commerce and the Detroit Board of Commerce, the Akron City Club, and the Fairtown Heights Golf Club. In Detroit he is a member of the Fellowcraft Club and the Birch Hill Country Club. Three of his brothers, Banks J. Wildman, Theodore T. Wildman and Joseph W. Wildman, are, respectively, secretary, assistant sales manager and Chicago district manager of the Portage Rubber Co.

PERSONAL MENTION.

Howard H. McGee was born in Hartford, Connecticut, and in the early eighties his father, the late C. Thornton McGee, purchased the druggists' sundry business of the John W. Gray Co., whose factory subsequently became the Hartford Rubber Works Co. In 1900 Mr. McGee entered the employ of the Seamless Rubber Co., New Haven, Connecticut, starting in the factory and after two years' inside experience he represented the firm in the New England territory. In 1905, he was made manager of the Chicago office. Two years later, the Seamless Rubber Co. sent him to Europe to investigate trade conditions. After representing Davol Rubber Co. for several years in the south, Mr. McGee accepted the management of the druggists' sundries department of Ajax-Grieb Rubber Co., and for the last five years he has been connected with the United States Rubber Co.

Howard H. McGee.

Dr. Frederic Dannerth, the well-known rubber chemist, who last winter gave a series of lectures in Newark on corporation chemistry, has again established his office as consulting chemist in Newark, New Jersey.

S. V. Norton, for fifteen years with The B. F. Goodrich Co., Akron, Ohio, has resigned to accept the position of service manager of the General Motors Truck Co., Pontiac, Michigan, effective July 1, succeeding H. L. Beckwith, resigned.

R. L. Armstrong has been appointed manager of the Omaha branch of the Pennsylvania Rubber Co., Jeannette, Pennsylvania. He succeeds Dan McAvoy, resigned.

E. H. Watson, 98 Park Place, New York City, American representative of Alfred Smith, Limited, Manchester, England, manufacturer of chemicals for the rubber trade, is at present in England but expects to return to New York about the middle of July.

John H. Mills has been elected vice-president of the Hilo Varnish Corporation, Brooklyn, New York, which manufactures a flexible varnish for rubberized fabrics. Mr. Mills has been with the Hilo company for thirty-five years and for some time has been a member of the board of directors.

C. H. Connelly has been appointed southwestern manager of The Rubber Products Co., Barberton, Ohio, with headquarters at Kansas City, Missouri. He will control the territory from Nebraska to the Gulf and from St. Louis to Denver.

George B. Kretsinger has been appointed office manager of the Kansas City branch of The Rubber Products Co., Barberton, Ohio, effective July 1.

Colonel Samuel Pomeroy Colt and party of guests left Providence June 4 for Camp Colt in the Maine woods to enjoy a three weeks' fishing trip. The camp is located on Kidney Point

at the base of Mount Katahdin, amid beautiful scenery, some thirty-five miles up the Penobscot river from Norcross. Trout and bass fishing is unexcelled.

John W. O'Bannon, head of the International Rubber Co., carriage cloth manufacturers, and of the O'Bannon Corporation, manufacturers of a leather substitute, who has been committed to a sanitarium since the middle of April, has been declared by a sheriff's jury to be incompetent to manage his own affairs and a committee is to be appointed. Mr. O'Bannon's career has been a remarkable one. Starting on a shoestring, he built up his business to corporations in which he has a $15,000,000 interest. Although declared mentally incurable by several alienists, he retains a wonderful mind and memory. He is still a young man of fifty and his friends in the rubber trade believe he will come back.

SALES MANAGER, SYRACUSE RUBBER CO.

Frank G. Mauthe, general sales manager of The Syracuse Rubber Co., Inc., Syracuse, New York, brings to that position an extensive and varied sales experience obtained with several prominent firms.

Frank G. Mauthe.

Born in North Clarendon, Pennsylvania, in 1883, he attended the grammar schools and from his boyhood until 1904 was engaged with his father in the mercantile business. Thereafter, for three years, he was store manager for the Vulcan Trading Co., then for two years department manager for the M. O'Neil Co., when, in 1910, he became an adjuster, office manager, and salesman for the Diamond Rubber Co. In 1912 he became identified with The Goodyear Tire & Rubber Co. as branch manager, which position he occupied until 1916, when he was appointed special factory representative of the Marathon Tire & Rubber Co., holding this office for three years. When the Syracuse Rubber Co. was organized in 1919 he accepted his present position as general sales manager.

Mr. Mauthe is a member of the Kiawanis Club, St. Albans No. 68 F. & A. M. and Branch Brook Chapter No. 47 Royal Arch Masons, both of Newark, New Jersey.

THE RUBBER TRADE IN THE EAST AND SOUTH.

By Our Regular Correspondent.

NEW YORK NOTES.

The Hudson Tire & Rubber Corporation has been incorporated under the laws of New York with a capital of $1,000,000. The offices are at Yonkers, New York, where a twenty-acre tract of land has been acquired and a modern factory will be erected for producing cord and fabric tires, tubes, solid truck tires, and other rubber goods. The officers of the company are: W. M. Doucette, president and general manager, and H. B. Seymour, vice-president and treasurer. Mr. Doucette has been in the tire business for a quarter of a century representing manufacturers in this country and abroad, and he was lately eastern district manager of The Mason Tire & Rubber Co. of Kent, Ohio. Mr. Seymour, who has been editor and business manager of "The Rubber Age and Tire News" and "Tire Trade Journal," entered the rubber business seventeen years ago with the Boston Woven Hose & Rubber Co. of Cambridge, Massachusetts, and later was with the Davidson Rubber Co. of Charlestown and the Plymouth Rubber Co. of Canton, Massachusetts.

Leslie & Knoke is the firm name of a new copartnership of crude rubber brokers, at 60 Stone street, New York. One of the partners is Charles S. Leslie, who started as an office boy 23 years ago with Reimers & Meyer and stayed through the successive changes in that house until it became Poel & Kelly. About a year ago he began business by himself. The other partner is Edward J. Knoke, who began twenty years since with Eggers & Heinlein, then went to Robinson & Co. and later to Constantino P. Dos Santos. When that firm was reorganized he went with Albert V. Tallman and three years ago became an independent broker.

The National Association of Corporation Schools, which includes some of the largest employers of labor in the United States, held a five-day convention at the Waldorf-Astoria, New York, the first week in June. The committee making a report on unskilled labor and Americanization included C. S. Coler, Westinghouse Electric & Manufacturing Co.; S. H. Renton, American Hard Rubber Co.; and B. N. Rohrer, The B. F. Goodrich Co.

The Rubber Corporation of America, recently organized, has its general offices at 240 West 55th street, New York City. The officers are: F. I. Reynolds, president, also vice-president and director of sales of the Empire Tire & Rubber Corporation, Trenton, New Jersey; Charles Austin Bates, vice-president, in charge of advertising, also vice-president of the Sterling Tire Corporation, Rutherford, New Jersey; W. A. Reynolds, J. Baker Taylor, Ralph V. Dickinson, and William D. Harris, vice-presidents in charge of sales; W. M. Pepper, chairman of the board, a member of the New York banking firm of Campbell, Heath & Co.; A. W. Fargo, secretary; directors—F. I. Reynolds, C. E. Murray, Sr. and Jr., C. A. Bates, J. A. Miller, W. T. Baird, W. M. Pepper, and Charles Austin Bates.

The company will maintain warehousing facilities in eight or ten of the principal cities in the United States where the goods of manufacturing companies will be warehoused and thence distributed. The selling organization will be much under the same direction and will perform for the manufacturing companies an economical selling and distribution service.

The Watson-Stillman Co., New York City, manufacturer of rubber machinery, packing, etc., has elected the following officers: E. A. Stillman, president, supervising sales; Carl Wigtel, vice-president and chief engineer; J. D. Brooks, treasurer; and A. Parker Nevin, secretary. LeRoy T. Brown has been appointed works manager, J. W. Delano, assistant works manager, and W. H. Martin, purchasing agent. The board of directors includes E. A. and A. F. Stillman, Carl Wigtel, A. Parker Nevin, W. L. Wright, George T. Ordway, and F. A. Hutson. G. D. Kershaw and J. F. Lary are no longer with the company and the positions of general manager and superintendent have been discontinued.

The Majestic Sales Corporation, 1834 Broadway, New York City, will distribute in the eastern and northeastern states the products of the Majestic Tire & Rubber Co., Indianapolis, Indiana, maker of Majestic cord tires and tubes. G. W. Chapman, formerly with The Fisk Rubber Co., is New York district manager, and S. J. Anderson, formerly with the Brunswick-Balke-Collender Co., is in charge of sales in the New York territory.

The Advance Rubber Co., Brooklyn, New York, is completing its new plant, 200 by 130 feet, and expects to occupy it about

July 1. Cord tires and tubes will be added to the present line of fabric tires and by-product horse-shoe pads. L. M. Kaplan is secretary of the company.

Thos. E. Wilson & Co., Chicago, manufacturer of sporting goods, has purchased the factory of the National Base Ball Manufacturing Co., Schenectady, New York, and will continue in charge John H. Grady as director of the baseball manufacturing division of the Wilson company.

At its annual meeting held recently, the General Electric Co., Schenectady, New York, reelected the former directors and officers.

Among the exhibitors in the permanent International Exposition of Industries, which the Merchants' and Manufacturers' Exchange of New York is operating at the Grand Central Palace, there are many whose exhibits will interest the rubber trade. We note: New York Rubber Co., Schaeffer & Budenburg Manufacturing Co., McNutt Can Sales Co., Portable Machinery Co., Spadone Machine Co., Brunswick-Balke-Collender Co., Converse Rubber Shoe Co., The Raybestos Co., Revere Rubber Co., Tagliabue Manufacturing Co., Westinghouse Electric & Manufacturing Co.

Mitsui & Co., Limited, Japanese importer, has appointed M. Kobayashi its New York representative, with headquarters at 65 Broadway, the New York City office.

CONNECTICUT NOTES.

The Seamless Rubber Co., New Haven, has entered into a sales arrangement with Adolph Perlroth, a real estate dealer, whereby the latter will take its old plant and cut it up into smaller divisions for selling purposes. The Seamless company expects to move into its new plant at an early date.

The Carlisle Tire Corporation, 250 West 54th street, New York City, and Andover, Massachusetts, has purchased all the assets of the Carlisle Cord Tire Co., Inc., and early in June had completed approximately 85 per cent of the new factory now building at Stamford, Connecticut. It expects to have the new plant in operation about the middle of July. Cord tires and truck tires will be manufactured exclusively. The concern is incorporated for $3,000,000 preferred stock and 300,000 shares of common without par value, under the laws of Delaware. J. S. McClurg is production manager.

PENNSYLVANIA NOTES.

The Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, has elected the following directors for the ensuing three years: Guy E. Tripp, chairman of board; Joseph Marsh, H. H. Westinghouse, and Albert H. Wiggin. George W. Davison, president of the Central Union Trust Co., New York City, was selected by the board of directors to succeed James N. Wallace, deceased, and was elected by the stockholders for the term expiring June, 1921.

The Westinghouse Air Brake Co., Wilmerding, Pennsylvania, and not, as reported, the Westinghouse Electric & Manufacturing Co., has acquired ownership and control of the Westinghouse Union Battery Co., Swissvale, Pennsylvania.

The Vulcan Rubber Co., Erie, Pennsylvania, has just completed a two-story building, 76 by 123 feet, in which it is installing machinery for the manufacture of cord tires. It also plans to increase its production of fabric tires, for which it has purchased additional equipment.

The Allen Tire & Rubber Co., 510 Hamilton street, Allentown, Pennsylvania, has completed the organization of its $2,500,000 company and expects to start production of tires and tubes in September in the factory which is now under construction. The officers of the company are: Wilmer Dunbar, president; H. F. Clemmer, vice-president; T. S. Johnson, secretary; J. T. Leathers, treasurer. A. C. Leathers and Fred Leathers are sales agent and fiscal agent, respectively.

"The Pennsylvania Rubber Co., Jeannette, Pennsylvania, has leased for the summer season a commodious cottage at Put-In-Bay, Ohio, for the purpose of providing vacation quarters for the young women in its offices. Twelve can be accommodated at once, and each girl will have a two weeks' vacation. A competent chaperone will be in charge.

Blakey & Hall, Pittsburgh, Pennsylvania, have been appointed distributers for the product of The India Tire & Rubber Co., Akron, Ohio.

The U. S. Compression Inner Tube Co., Inc., Tulsa, Oklahoma, has bought the property of the Kattanning Plate Glass Co., Kattanning, Pennsylvania, and will remodel the buildings at once for an eastern factory. A new structure will also be built in the spring. This factory will take care of the company's business east of the Mississippi river.

The Black & Decker Manufacturing Co., Towson Heights, Baltimore, Maryland, has moved its Philadelphia office, of which W. C. Allen is branch manager, to more spacious quarters at 318 North Broad street.

At the organization meeting of the Industrial Cost Accountants' Association at Chicago, on June 18, M. F. Simmons of the General Electric Co., Schenectady, New York, was elected president; C. H. Smith of the Westinghouse Air Brake Co., Wilmerding, Pennsylvania, was elected first vice-president and A. A. Alles, Jr., of the Fawcus Machine Co., and the Schaeffer Engineering and Equipment Co., Pittsburgh, Pennsylvania, was chosen secretary-treasurer. Headquarters of the Association will be in Pittsburgh, at the office of the secretary-treasurer, 1501 Peoples' Bank Building.

SOUTHERN NOTES.

C. F. Batton, who has been with the Atlanta and Birmingham branches of The Fisk Rubber Co. for the last four years, has been made manager of the new branch office recently opened at Jackson, Mississippi. Mr. Batton served nine months in the army during the war and was a second lieutenant in the Sixth Pioneer Infantry at Camp Sherman, Ohio, when discharged. The Jackson branch is the 128th to be established by the Fisk company in this country.

C. F. Batton.

The McClaren Rubber Co., Charlotte, North Carolina, has appointed Charles G. Miller chief chemist. He was formerly assistant chemist of the Racine Rubber Co., Racine, Wisconsin.

The India Tire & Rubber Co., Akron, Ohio, has given the distribution rights for its products in Baltimore, Maryland, and the surrounding territory to Frank G. Schenuit.

The Kentucky Tire & Rubber Association, 502-503 Realty Building, Louisville, Kentucky, will begin excavation and construction on its new factory as soon as its railroad switch, now being laid, is completed. It expects to have the factory completed, also, in about four months.

R. H. Brown, formerly with the Kelly-Springfield Tire Co., in Akron and the Ideal Tire & Rubber Co., Cleveland, Ohio, has been engaged as superintendent of the new factory to be built by The Kentucky Tire & Rubber Association, Louisville, Kentucky.

The DuBois Rubber & Tube Co., 315-318 Volunteer State Life Building, Chattanooga, Tennessee, recently incorporated for the purpose of manufacturing a compression inner tube of the type that does not leak air when punctured, will also make the ordinary inner tubes and tire casings. It intends to increase its capital to $2,000,000 in the near future. The officers are: J. D. DuBois, president; L. H. Lightfoot, vice-president; P. B. Whit-

aker, secretary and treasurer; M. N. Whitaker and J. A. Stith, directors, in addition to the other officers.

The Hopewell Insulation & Manufacturing Co., Inc., Hopewell, Virginia, will begin about July 15 to manufacture hard rubber, condensation molded insulation parts, molded high tension insulators for all wireless and transmission purposes, etc. It uses the trade marks "Paramold," "Synthek," and "Himconite" on its hard rubber, high heat, and composition products, respectively.

With headquarters and general offices in Atlanta, Georgia, Couch Cotton Mills, Inc., has been formed by the consolidation of Couch Mills Co., Atlanta, Georgia, Beaver Duck Mills, Greenville, South Carolina, and Beaver Cotton Mills, Thomson, Georgia, with a capital and surplus of approximately $2,500,000. The officers are: Asa G. Candler, Sr., chairman board of directors; W. D. Couch, president; L. J. Powers, vice-president and secretary; and Walter T. Candler, treasurer. In addition to these, the board of directors includes A. P. Coles, Atlanta, Georgia, A. W. Townsend, New York City, and S. M. Graves, Charlotte, North Carolina. No change is contemplated in the management of the separate mills, which are in full operation day and night and manufacture a wide range of fabrics, including light-weight drills, beach cloths, filter twills, wide, sail, army and heavy belting ducks, etc., for both domestic and foreign use. Sales offices are maintained at 320 Broadway, New York City, in charge of A. H. Penfield.

THE RUBBER TRADE IN NEW JERSEY.

By Our Regular Correspondent.

MISCELLANEOUS NEW JERSEY NOTES.

A decree signed by Chancellor Walker dismissing the bill of Clement Eckrode, of Highland Park, against the Endurance Tire & Rubber Co., of New Brunswick, on the ground that the Court of Chancery has no jurisdiction to interfere with the internal affairs of a New York corporation, has been filed with the county clerk of Middlesex county. Mr. Eckrode sought to set aside a conveyance by the company.

The Rubber Goods Manufacturing Co., New Brunswick, has filed a certificate of dissolution in the office of the Secretary of State. The company was incorporated in 1884 by Samuel Moore, Walter S. Bolton, Charles Clair, Lester Leland, Thomas E. Sawyer and James Deshler.

The Rubber Tire Co., of 32 Branford place, Newark, of which Russell T. Binder is president, will erect a three-story addition, 26 by 30 feet, to the present structure. The building will be of brick and will cost $16,000.

The Driver-Harris Company, Harrison, New Jersey, manufacturer of electrical wire, etc., has just completed a three-story building, 50 by 100 feet, which will later be increased to 50 by 200 feet. The contracts for the addition have already been let. The top floor will be used as a general office and the second for manufacture.

The Red Raven Rubber Co., 152-158 Sussex avenue, Newark, New Jersey, has bought the Ideal Wheel Tire Co. of the same city.

The Smith Rubber & Tire Co., Inc., 625 Main avenue, Passaic, New Jersey, expects to begin production about the middle of August. Machinery, molds and tire-building stands have been ordered, and the new factory is rapidly being completed. The officers of the company are: Winfield Clearwater, president; Fred W. Smith, vice-president; Dudley Gordon, secretary; and Thomas A. Hopkins, treasurer.

The Stanwood Rubber Co., Elizabeth, New Jersey, that absorbed the Hardman Rubber Corporation, of New Brunswick, New Jersey, has New York offices at 6 East 30th street. It supplies unvulcanized gums—tread, camel back tread, cushion, tube repair and cured-back tube gums; fabrics—building, bead, breaker and cord fabrics; and cements—vulcanizing, patching and quick-curing vulcanizing cements and acid-curing solution.

K. H. Dresser was promoted early in 1920 to the position of branch manager of The Goodyear Tire & Rubber Co. at Newark, New Jersey. Mr. Dresser's first connection with The Goodyear Tire & Rubber Co. was in 1912, as assistant manager of the mechanical goods department at Akron, Ohio. A year later he was sent to Portland, Maine, as branch manager, remaining until April 1, 1915, when he was transferred to a similar position at Springfield, Massachusetts. In the summer of 1917 he was recalled to Akron to act as staff man on motorcycle tires, and was soon placed in charge of the cycle tire department. On January 1, 1918, he was sent to the New York and New England districts in connection with the company's second sale of preferred stock, in which he was exceptionally successful. He was then attached to the manufacturers' sales department, with headquarters in New York City, and continued this work until transferred to his present position.

TRENTON NOTES.

The Bergougnan Rubber Co., Trenton, has begun the erection of three additions to its plant, and will eventually double the size of the works. One of the buildings is two stories high and measures 60 by 120 feet. Another is a machine shop, two stories, 40 by 170 feet. A good-sized storage building is about to be completed. The company will expend between $50,000 and $60,000 for new machinery. The buildings will be of brick and steel with concrete floors. The new operations will cost $100,000. The largest addition will be used for the manufacture of tires.

The Thermoid Rubber Co., Trenton, will purchase about $100,000 worth of machinery to be used in the new addition now being erected. The company will not yet disclose the nature of the machinery, which is being purchased through the builders, Karno-Smith Co., of Trenton.

The Empire Tire & Rubber Corporation has made complaint to the City of Trenton in an effort to have portions of the Assanpink Creek filled in. The company has suffered considerably through water backing up in the creek and flooding the lower floors of the plant.

The Essex Rubber Co. Mutual Benefit Association, Trenton, has elected the following officers: James Kelly, president; C. L. Stokes, vice-president; Walter Gratton, secretary, and E. R. Rogers, treasurer; Miss Catherine Franks, J. V. Hall and J. Oscar Reynolds, members of the executive committee.

The employes of the Essex Rubber Co. recently held an entertainment and dance at the Crescent Temple, Trenton. W. G. Sanders, J. C. Cartlidge and L. M. Oakley comprised the committee in charge.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

Expansions and improvements at the plant of the Revere Rubber Co., on Eagle and Valley streets, Providence, continue, several projects being under way at the present time. Among these is the erection of a garage building with all modern appointments and equipment with a capacity to start for 25 cars. The building is so planned that additions can be made as necessity demands.

Work has been started on two large additions to the plant of the Jenckes Spinning Co., Pawtucket, that have been made necessary by the increasing demands upon the company for textiles used in tire production. One of the new structures is to be a four-story manufacturing building of brick, mill construction, 128 feet long and 100 feet in width, to cost about $100,000. The other is a two and one-half story addition on top of the present storehouse, which is about 100 feet long and 70 feet wide, of brick fireproof construction.

The corporation return of the Jenckes Spinning Co. has been filed at the office of the city clerk of Pawtucket. It sets forth

that April 26, 1920, an addition of common stock of $1,800,000 was issued, making 10,000 shares of preferred stock, par value $100 each share, total $1,000,000, now outstanding; and 36,000 shares of common stock of par value of $100 each, total par value $3,600,000 now outstanding, and that of said stock had been paid in. The certificate is signed by LeRoy Fales, president; F. L. Jenckes, treasurer; J. W. Baker, secretary; also by LeRoy Fales, Albert A. Jenckes and F. L. Jenckes, a majority of the board of directors.

The Elastic Webbing Co., Pawtucket, Rhode Island, has completed plans for the erection of its proposed new plant at Dixfield, Maine, to consist of a four-story mill, 100 by 150 feet, to cost about $100,000. The structure will be located on a site near the Webb river.

The American Wringer Co. is to erect a three-story brick manufacturing building near its plant on Clinton street, Woonsocket, Rhode Island, the plans for which are all ready. It is to be 90 by 42 feet, of the slow-burning type of construction, and is to cost about $20,000.

Philias J. Savoie and Frank R. Larson are the proprietors of the Savoie Rubber Manufacturing Co., 17 Blackstone street, Woonsocket, Rhode Island, according to their statement filed at the city clerk's office in that city.

The National India Rubber Co., Bristol, has decided to operate a branch factory of the shoe division in Newport, Rhode Island, where a site has been selected and a building is to be erected at once. The branch factory will include the stitching department and about 200 young women will be employed at the start, and this number will be increased as the work progresses. It is planned to have the new branch ready for operation by September.

Leon F. Ballou has resigned his position with the shipping department of the Alice Mill, Woonsocket Rubber Co., having been appointed traffic manager for the Alice and Millville plants of the Woonsocket company. On the day that he left his old position, on behalf of his former associates John Riley, who succeeded him as foreman of the shipping department, presented him $25 in gold.

A factory paper is to be organized at the plant of the National India Rubber Co., Bristol, in the near future, all plans and arrangements having already been made. An editor has been appointed and an office is being fitted up for his use. A contest for the name by which the paper shall be known is under way, and a prize will be given for the winner, a ballot to be taken on the best eight names proposed.

The additions and improvements that are being made at the plant of the Mount Hope Spinning Company, at Warren, Rhode Island, are being pushed toward completion as rapidly as possible. The new addition to the main section, 100 by 200 feet, is practically finished; the sprinkler system is already installed throughout and the electric power is ready for use; the piping has been completed and the plumbing is nearly done. The 40 by 70 addition to the old plant is also nearly completed.

George W. Romprey, a repairman of Woonsocket, Rhode Island, has been adjudged a bankrupt upon an involuntary petition filed by three creditors who were: The Goodby-Rankin Co. of Rhode Island, with a claim for $2,576.35; The Fisk Rubber Co. of New York, $2,096.31 and The B. E. Goodrich Rubber Co., of Ohio, for $2,352.42. Elisha C. Mowry has been appointed receiver.

A new 100,000-gallon steel water tank is being erected by the O'Bannon Corporation at its rubber plant at Bay Spring in West Barrington, Rhode Island, for protection against fire.

THE RUBBER TRADE IN MASSACHUSETTS.

By Our Regular Correspondent.

BOSTON NOTES.

One of the latest problems added to the already long list of rising costs is that of motoring in general and of tires in particular. If the life of a set of automobile tires can be prolonged 25 per cent, the saving is four times the increased cost of gasoline for a season. With this in mind, and to help combat the high cost of motoring, The B. F. Goodrich Co. recently inaugurated a "Save-Your-Tires" week in Boston, as it has done in other cities. As an important part of the program many local motion picture houses exhibited during that week the Goodrich film entitled "Striking Tires." It is of the humorous cartoon type and drives home in an entertaining manner the most serious features of tire neglect and points out the things a motorist should avoid in order to extend the life of his tire equipment.

The Pennsylvania Rubber Co. has appointed L. J. Waldron as its New England manager. Mr. Waldron has been selling Pennsylvania tires for five years, previous to which he was connected with The B. F. Goodrich Co. for a like period.

The Gillette Rubber Co. agency, the Gillette Tire Co., at 587 Boylston street, Boston, has been taken over as a factory branch with Frank C. Stetson as district manager. Mr. Stetson was formerly with the Lee Tire & Rubber Corporation. He has been selling tires in New England for eighteen years, and is one of the oldest tire salesmen in the country in point of service.

The Lambert Tire & Rubber Co., Akron, Ohio, has opened a store for the New England distribution of the Lambert "Trublpruf" cord tire at 823 Boylston street, Boston. The officers of the Boston concern are A. J. Millward, James J. O'Brien and L. H. Plummer. The Lambert tire is built with stretchless cord belts placed between layers of rubber with air holes placed around the tire in such a way as to give it the resilience of a pneumatic. It contains no inner tube and requires no inflation.

The old Park Riding School, in the center of the tire district at Ipswich and Lansdown streets, where the élite of Boston learned to ride horseback, has been remodeled and equipped as a storage warehouse for tires by The B. F. Goodrich Rubber Co. The premises consist of three buildings, affording a total of 73,000 square feet. Here the company will garage its cars and maintain a large distributing center. F. D. Keen, formerly assistant operating manager, has been placed in charge.

The India Tire & Rubber Co., Akron, Ohio, has appointed W. W. Alexander as its factory representative in New England, with headquarters in Boston. Mr. Alexander is well acquainted with the New England trade through long association with the Diamond Rubber Co. in the early days of the industry. He comes to the India Tire & Rubber Co. from the Dayton Tire Co.

The Converse Rubber Shoe Co., Malden, has opened a Boston salesroom at 801 Boylston street for the sale of Converse cord tires. F. R. Goodell, formerly in charge of New York footwear sales for the company, is manager.

The Joseph E. Greene Co., 113 Federal street, Boston, has been appointed New England distributer for Empire tires and tubes.

R. R. Cowen, of the sales force of the E. H. Clapp Rubber Co., Boston, was married on June 19 to Miss Mabel S. Thompson, an alumna of Smith College, class of '18. Mr. Cowen is a graduate of Harvard College, class of '16. He enlisted in the Army during the late war and was assigned to Camp Zachary Taylor, where he earned a commission as a lieutenant of artillery.

Boston's Ancient and Honorable Artillery Company observed its 282nd anniversary on June 7, 1920, and at the annual drumhead election chose Captain Francis H. Appleton, Jr., adjutant. He is following close in the steps of his father, who, as Commander of the organization, led the peaceful "invasion" of England. In the war the son was Captain of the 67th Company of the State Guard.

MISCELLANEOUS MASSACHUSETTS NOTES.

The tire division of the Converse Rubber Shoe Co., Malden, Mass., is now in charge of Dr. Ernest A. Wullenweber, an expert of twenty-two years' experience in the chemical laboratories of leading rubber companies. For ten years he was in the Morgan & Wright factory of the United States Rubber Co. at Detroit, Michigan, and he came to the Converse forces from the Mid-Continent Tire Manufacturing Co., of Wichita, Kansas. Under his direction the Dainty Maid shoe factory is being converted into an enlarged tire plant, and henceforth Converse tires will take a more prominent place in the trade.

All factory operatives of the Converse Rubber Shoe Co., Malden, are now protected by three forms of insurance. Life and accident insurance have been in effect for some time, but effective June 1 a disability insurance was added. Under this policy every employe will receive 60 per cent of the regular weekly earnings whenever more than seven days are lost through sickness of any kind, or accident or injury sustained outside of the factory.

The George Grow Tire Co. has found day and night production necessary to meet the demand for Grow tires, and the factory at Canton Junction, Massachusetts, is soon to be enlarged.

The Monatiquot Rubber Works Co., of South Braintree, Massachusetts, has let a contract for the construction of a second siding on the Plymouth Division of the New York, New Haven & Hartford Railroad. This will open up for manufacturing purposes a very desirable allotment of land on which it is probable that an independent reclaiming unit will be built and the company's plans for housing employes, which were held up by the war, may be carried through to completion. It will also enable the company to store coal for a year's consumption.

Dining with music is an excellent feature of the big new employes' restaurant on the roof of the Hood Rubber Co. office building at Watertown, Massachusetts. The force boasts a wealth of musical talent and volunteers are providing daily instrumental and vocal concerts during the noon hour that send the Hood operatives back to their work singing. This attractive cafeteria is serving seven hundred luncheons daily and small branch lunch counters have been established in different parts of the factory to take care of those who do not go to the main restaurant.

The New England Tire & Rubber Co., 285 High street, Holyoke, Massachusetts, is to build a factory on a site recently acquired from the Holyoke Water Power Co., for the manufacture of the "Holyoke" cord tire and the "Connecticut Valley" inner tube. Plans for its construction are now being completed and it is expected that building operations will begin at an early date. The factory will be planned to produce 1,000 tires daily, and the latest machinery will be installed. The officers of the company are: George K. Culp, president, sales manager and director, formerly with the United States Rubber Co., the G. & J. Tire Co., and The Mid-Continent Tire Manufacturing Co.; E. J. Kearns, vice-president and production manager, formerly with The Fisk Rubber Co. and the Lee Rubber Co., also associated with the Dunlop Pneumatic Tyre Co. of Australasia, Limited; C. S. Huntley, treasurer, general manager, and director, formerly with the Delion Tire & Rubber Co. and the Midco Tire Co., Inc.; and S. R. Huntley, secretary and director. The other directors include: George P. O'Connell, T. E. Morris, W. C. Van Brunt, F. W. Callahan, John Kearns, J. Sidney Bernstein, and Joseph F. Ranger. The company is incorporated under the laws of Delaware with a capitalization of $1,500,000 of eight per cent preferred stock and $1,500,000 of common stock with par value of $10. Executive offices are maintained at 43 East 47th street, New York City.

The Crompton & Knowles Loom Works, Worcester, Massachusetts, has increased its capital stock from $6,000,000 to $8,000,000. John F. Tinsley, vice-president and general manager of the company, has been appointed a representative of employers on the committee named by the Massachusetts Department of Labor and Industries to frame a safety code in the wood-working machinery industry.

The new Industrial Banking System introduced by the Boston Woven Hose & Rubber Co., Cambridge, has had a wonderful success. The plan was instituted in cooperation with the Manufacturers' National Bank of Cambridge to enable the employes to have all the conveniences of a savings bank without having to take the time to go to the bank to open an account or make a deposit. All banking except the withdrawal of money is handled in the plant. One dollar opens an account and encourages the small earner to start saving. When the money is collected a sum corresponding to the amount of money deposited is placed in the employes' bank book, and a duplicate stamp of the same number goes with the money to the bank. Stamps have no negotiable value, serving simply as a memorandum of deposit. Although only in operation a short period, nearly 300 accounts have been opened and the average amount deposited weekly at the present time is in the vicinity of $500. It is safe to assume that a large percentage of this amount would not otherwise have been laid aside.

A WELL-KNOWN TIRE MACHINERY INVENTOR.

Thomas Midgley, consulting engineer and inventor, now in charge of the development work of The Fisk Rubber Co., Chicopee Falls, Massachusetts, has for many years been well known for his activities in devising new and better machines for the manufacture of tires.

Thomas Midgley.

Born in London, England, in 1860, Mr. Midgley soon came to America, and was educated in the public and evening schools of Worcester, Massachusetts. In 1874 he secured employment in a shoe factory, and four years later became a time-keeper and foreman in a wire mill in Worcester. This experience led in 1884 to his appointment as superintendent of the Hartman Steel Co., Beaver Falls, Pennsylvania. Four years later he started in business on his own account manufacturing wire goods and torpedo nets.

In 1896 he accepted the position of superintendent of the Columbus Bicycle Co., Columbus, Ohio, and four years later again went into business for himself manufacturing steel wheels and automobile tire rims.

His first direct connection with the rubber industry was in 1905, when he became consulting engineer for the Hartford Rubber Works, Hartford, Connecticut, and allied companies, notably Morgan & Wright. In 1914 he was manager and one of the incorporators of the Midgley Tire & Rubber Co., a West Virginia corporation, and the following year of the Midgley Tires Co., an Ohio corporation. After developing a tire-building core for the Interlock Core Co., Columbus, Ohio, in 1917, he went to his present work at the Fisk plant.

Mr. Midgley is perhaps best known as the inventor of the Midgley collapsible core, though he has taken out numerous patents for miscellaneous tire machinery, some of the later ones being devices for wrapping bead wire and for trimming beads and tire flaps.

He is a member of the Society of Automotive Engineers and the Benevolent Protective Order of Elks.

FIRESTONE'S WESTERN SALES MANAGER.

Frank K. Starbird, western sales manager of the Firestone Tire & Rubber Co., Akron, Ohio, is one of Ohio's enterprising native sons. Born in New London, Ohio, in 1885, he was educated in the local grade and high schools and later in Ohio State University, at Columbus. He entered the employ of the Firestone company in April, 1916, beginning in the advertising department where he was soon made manager of the dealers' advertising department. Later, his activities being transferred to sales, he became manager of the pneumatic sales department, then manager of the Northwestern district, embracing the Minneapolis, Great Falls, Minot, Fargo and Des Moines branches, with headquarters in Minneapolis. At the beginning of the present year he was promoted to western sales manager, with headquarters in Akron.

Frank K. Starbird.

THE RUBBER TRADE IN OHIO.

By Our Regular Correspondent.

AKRON NOTES.

Working against transportation difficulties and the beginning of refinancing following the war period, were the dominant features of the rubber industry in Akron during the past month. The production of tires and rubber goods has been greatly retarded by the railroad situation and possibly by the credits extended by bankers to the industries. Although no definite announcements have been made, it is understood by bankers in the city that a large number of men have been laid off indefinitely and plans are under consideration for further curtailment unless the situation clears up in the very near future.

For some time after the railroad situation became serious the rubber factories employed truck trains to bring in fabric, which was scarce in the city, and in several instances armed trains were employed to bring fabric from the East. But after raw materials were supplied it became impossible to ship out manufactured goods. As a result it is generally understood, although no official statement has been forthcoming, that large amounts of manufactured goods are stored in warehouses and old buildings awaiting an opportunity to ship.

However, the effect of the temporary depression upon the city is not regarded as serious by the manufacturers or Akron bankers. In an interview given by D. R. Held, cashier of one of the largest banks and dean of Akron bankers, he expressed the opinion that this situation is exactly the thing needed to bring business back to its normal basis. "All our industries had gone mad about business and they were attempting to do more than they were able to handle, and if the switchmen's strike had not occurred it is not unlikely that business would have received a severe blow by the continued inflation. As it is, the business men were warned in time to curtail and the depression will come and go without leaving any failures in its wake," he said to the correspondent of The India Rubber World.

The freight situation in Akron proper has been entirely cleared up and the resumption of normal shipping of goods depends entirely upon the increase in efficiency of the transportation system outside of the city itself.

The following promotions in the executive force of The B. F. Goodrich Rubber Co., Akron, were recently announced: V. I. Montenyohl and L. L. Smith, credit managers, have been made assistant treasurers, and W. C. Arthur, assistant secretary and counsel.

V. I. Montenyohl has been connected with the Goodrich company for thirteen years, having started in 1907 as a stenographer in the treasurer's department. He began his credit work in 1910 and after several years handled the more important duties of the credit department. He was appointed credit manager in the spring of 1917.

L. L. Smith, who has completed twelve years of service, became connected with the Goodrich company in 1908 as receiving clerk in the tire adjusting department, and later was advanced to tire adjuster and then to assistant manager of the Kansas City branch. In 1914 he was made special salesman in the Kansas City territory. He was transferred to the Akron credit department in 1915 and after two years in that department was made credit manager.

L. L. Smith. V. I. Montenyohl. W. C. Arthur.

W. C. Arthur became associated with the Goodrich company in 1917 when the legal department was organized. He is a graduate of the University of Pittsburgh, class of 1907 and took his law degree in 1913.

The B. F. Goodrich Co., Akron, announces the following changes in personnel: F. W. Jones, formerly in charge of footwear sales, has been assigned to special sales work; W. E. Hawkins will succeed Mr. Jones as manager of footwear sales, and F. C. Garrett will succeed Mr. Hawkins as operating manager, assisted by A. W. Thompson, formerly chief clerk at the Akron branch. H. A. Staley will combine the duties of chief clerk and adjuster at the Akron branch.

Athletes of The B. F. Goodrich Co., for the fourth time in succession, won the Akron Industrial League track meet championship Memorial Day, the results being: Goodrich, 59 points; Goodyear, 58; Firestone, 56, and Miller, 16.

Rex Lake, one of the largest industrial playgrounds in the world, which is operated for the employes of The B. F. Goodrich Co., has been opened for the season. The sports at the grounds include baseball, tennis, cricket and soccer, as well as boating and canoeing. Boats and fishing tackle are provided for those who wish to fish. Special playgrounds for children have been provided and a large roomy cottage equipped with kitchens, dining and rest rooms has been remodeled for the season.

Honoring Mr. and Mrs. John R. Gammeter, who left June 23 for a tour of Europe, employes in Mr. Gammeter's department at The B. F. Goodrich Co. gave a banquet at Young's Hotel, June 3, presenting Mr. and Mrs. Gammeter with a leather-bound book containing the autographs of those present. About 156 participated in the event.

The Firestone Tire & Rubber Co. plant was recently closed down for thirty minutes to enable the men to hear in three mass meetings the story of the "Inter-Church World Movement," staged by Protestant churches to obtain more than

$350,000,000 for improvement of church work. H. S. Firestone, president, was one of the speakers at the meetings.

A branch of the Akron public library will be opened at the Firestone Club House at an early date. Carpenters have been at work preparing a special room to accommodate it.

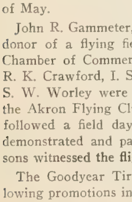
The controlling interest in the Biltwell Tire & Rubber Co., Akron, has been purchased by The Wildman Rubber Co., 816 Book Building, Detroit, Michigan. The following officers have been elected, the former ones having resigned: W. W. Wildman, president and general manager; M. Braley, vice-president, and C. R. Twynham, secretary-treasurer. In addition to the above, the directors include L. C. MacGregor, Detroit, Michigan; George W. Sieber, J. C. Clinefelter and E. H. Trump, Akron, and B. O. Etling and A. F. Stuehldrehr, Barberton, Ohio. The Biltwell factory has a daily capacity of 500 pneumatic tires and 1,000 inner tubes, which will presently be doubled by an addition to the plant. The Biltwell will henceforth be financed by The Wildman Rubber Co.

The Akron Rubber Mold & Machine Co., Akron, has broken ground for an extensive addition to its plant which will more than double its present capacity for the manufacture of tire building and tire repair equipment. The present plant covers more than 75,000 square feet of floor space. Particular demand is being made for equipment for producing cord and giant pneumatic truck tires, and the company's foreign trade is now greater than ever before in its history. New machinery ordered for the extension is being temporarily installed in the present quarters in order to increase production without waiting for the completion of the addition.

C. W. McLaughlin, vice-president and treasurer of the Mohawk Rubber Co., was one of the principal speakers at the annual convention of Federal Reserve bankers at Cleveland the latter part of May.

John R. Gammeter, of The B. F. Goodrich Co.; W. E. Wright, donor of a flying field; B. A. Polsky, president of the Akron Chamber of Commerce; Mayor Carl F. Beck, C. W. Seiberling, R. K. Crawford, I. S. Myers, George Kile, Ralph H. Upson and S. W. Worley were named an honorary board of governors of the Akron Flying Club at a meeting held recently. The meeting followed a field day in which a large number of planes were demonstrated and passengers carried. Approximately 8,000 persons witnessed the flights.

The Goodyear Tire & Rubber Co., Akron, announces the following promotions in its sales organization. L. C. Gates has been made manager and H. E. Waldsmith has been selected as branch manager at Akron.


L. C. GATES.

L. C. Gates entered the employ of the company in a clerical capacity in the assistant division of the automobile tire department in 1915, and was soon transferred to city sales work in the Philadelphia, Pennsylvania, branch. His next step forward was as assistant manager at Philadelphia, followed in 1919 by assignment as manager of the Dayton, Ohio, branch. Owing to his organization ability his promotion to the management of the motorcycle tire sales division of the automobile tire department at Akron followed early in 1920.

H. E. Waldsmith's first connection with the Goodyear company began in 1915 as a special traveling representative in the bicycle and motorcycle tire department. After a year he was assigned to sell Goodyear motorcycle tires. In 1918, he was transferred to the automobile tire department, and in about a year was promoted to special representative, calling on dealers and motorcycle manufacturers. On July 1, 1919, he was appointed branch manager at Youngstown, Ohio, where his splendid record brought further recognition early in 1920 by his appointment as branch manager at Akron.

The Goodyear Tire & Rubber Co. has announced that the Wingfoot aviation station recently purchased from the Government, will be thrown open to the general public in the very near future and the dirigible purchased from France will be on the ground for exhibition and test purposes. A large number of improvements are being made in the field.

The Goodyear engineering department will soon move into a new five-story building which is now being completed.

P. W. Litchfield, factory manager of the Goodyear Tire & Rubber Co., was the principal speaker at the simple unveiling of a tablet dedicated June 2 to the one hundred and five Goodyear men who gave their lives in the world war.

The stores established by the various rubber companies in order to reduce the cost of living to their employes have proved a success. The Goodyear Tire & Rubber Co. store, opened recently, did $4,000 of business the first day and thereafter the average sales a day have been $8,000.

Thirty motorcycle riders formed the initial membership of a motorcycle club organized in Akron. Their first meeting was held at the Firestone clubhouse. A gypsy tour for the latter part of June was the first event arranged by the new club. William W. Twite is president of the new organization.

CLEVELAND NOTES.

The Erie Tire & Rubber Co., Cleveland, Ohio, at meetings of stockholders held May 11 and May 26 voted to increase the capitalization of the company from $4,000,000 to $10,000,000, due to the remarkable growth of the company during its first year. The following directors were elected, two new ones being added: P. F. Wills, H. H. Forrest, M. C. Phillips, F. W. Hildebrand, A. M. Mander, C. V. Goepper and E. L. Braeunig.

The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio, has appointed G. E. Bovis manager of the Cleveland branch, succeeding E. F. Thompson, who recently went to the Pacific Coast. Mr. Bovis was formerly manager of the McGraw branch in Des Moines, Iowa, previous to which connection he was with The Fisk Rubber Co. at Sioux Falls, South Dakota.

The General Rubber Goods Co., Cleveland, Ohio, has increased its capital from $50,000 to $100,000. Griswold Wilson is president and Lindsay H. Wallace secretary and treasurer.

The Thor Tire and Rubber Co., 802 Society for Savings Building, Cleveland, with factory at Willoughby, Ohio, was incorporated under the laws of Ohio on December 1, 1919, with a capitalization of $1,000,000 consisting of $500,000 each of preferred and common stock. The first unit of the factory, which is 200 by 40 feet, has been practically completed, and mechanical rubber goods will be manufactured there at an early date. The main building will be 400 by 90 feet, with a capacity of 3,000 tires and 500 tubes. The property covers 44 acres, adjoining the New York Central railroad. M. W. Gary is secretary.

The partnership of Fanner & Brown, engineers, has been reorganized under the name of The Associated Engineers' Company, with offices at 130 Engineers' Building, Cleveland, Ohio.

The 1920 Credit Convention of the Motor and Accessory Manufacturers' Association, has been tentatively scheduled for Thursday and Friday, September 16-17, at Cleveland, Ohio. In view of the vital problems affecting the automobile industry, in relation to the general financial and credit conditions, it is believed that this year's credit convention will be one of the most interesting and important in the history of the association. Further details concerning the meeting will be announced later.

The National Sales & Trading Co. has removed from the Swetland Building to the entire sixth floor of the Racine Build-

ing, 11th and Chestnut streets, Cleveland, Ohio, in order to take care of increasing business in chemicals for the rubber trade.

JOHN MORGAN, PRESIDENT OF THE McGRAW TIRE & RUBBER CO.

At a special meeting of the board of directors of the McGraw Tire & Rubber Co., East Palestine, Ohio, on June 5, John Morgan, formerly vice-president and treasurer, was unanimously elected to the presidency, succeeding the late Edwin C. McGraw, founder of the company, who died at his southern home, Miami, Florida, on May 24, 1920.


John Morgan.

Mr. Morgan will also continue to serve as treasurer. He has been associated with the company almost since its inception ten years ago and has taken an active part in shaping its policies.

Mr. Morgan was born in London, England, in 1880, and in 1905 came to America to introduce the Kempshall tire into the United States. He is a director of the Rubber Association of America.

MISCELLANEOUS OHIO NOTES.

C. D. Rockwood, purchasing agent of The Mason Tire & Rubber Co., Kent, Ohio, has returned from the Far East. In connection with J. P. Mathews, the resident manager of the Mason Rubber Plantations Co. at Singapore, he has been undertaking negotiations for acquiring additional rubber plantations for the company

Four men were killed and approximately fifty injured when a benzol tank exploded June 7 as the result of a fire in the spreader room of The Mason Tire & Rubber Co. plant at Kent, Ohio.

The Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio, has changed its corporate name to "The Vaughn Machinery Co." C. W. Vaughn is still president and L. A. Vaughn secretary and general manager, and there will be no change in management, while the complete line of Vaughn machinery will be manufactured as heretofore.

The Giant Tire & Rubber Co., Findlay, Ohio; The I. J. Cooper Rubber Co., Indianapolis, Indiana, and Cincinnati, Ohio, and The Cooper Storage Battery Mfg. Co., have consolidated under the name, "The Cooper Corporation," with headquarters at Eighth and Main streets, Cincinnati, Ohio.

The Republic Rubber Corporation, Youngstown, Ohio, has elected the following officers and directors: William Wilms, chairman of the board; E. F. Jones, president; C. H. Booth, L. T. Petersen, H. J. Woodard and C. F. Garrison, vice-presidents; H. J. Stambaugh, treasurer; Arthur L. Irish, secretary. Directors—C. H. Booth, H. M. and Richard Garlick, Robert Bentley, R. E. Cornelius, John T. Harrington, E. F. Jones, R. C. Steese, John Tod, T. E. Borton and William Wilms.

The Rubber Products Co., Barberton, Ohio, has elected the following officers: W. A. Johnston, president; C. C. Schutz, vice-president and general manager; J. W. Blaser, treasurer; E. J. Schutz, assistant treasurer; J. M. Wylie, secretary; J. B. Chisnell, assistant secretary.

The Marion Tire & Rubber Co., Marion, Ohio, has elected the following officers: L. B. Walters, president; W. E. Cameron, vice-president; Sam F. Zilliox, treasurer; C. W. McLaughlin, secretary; W. P. Haynes, assistant secretary and assistant treasurer. Directors—Allan F. Ayers, R. C. Ellsworth, S. F. Zilliox, C. W. McLaughlin, L. B. Walters, R. D. Belden, W. E. Cameron, W. H. Holverstott, J. W. Jacoby and W. A. Patterson.

The Rotary Tire and Rubber Co., Zanesville, Ohio, has appointed as its sales manager, with headquarters at Zanesville. R. B. Ford, formerly special representative and branch manager of The B. F. Goodrich Co. at Utica and Syracuse, New York, and at Columbus, Ohio.

The Knox Tire & Rubber Co., Mt. Vernon, Ohio, is building a new factory for the manufacture of cord and fabric tires and red and gray tubes. The latest machinery, including equipment for making goods in millimeter sizes to take care of foreign business, will be installed. The building will be three stories high, 100 by 225 feet, of concrete, brick, and steel construction. F. D. Spencer is secretary-treasurer.

The McWade Tire & Rubber Co., Garrettsville, Ohio, has purchased a factory site on which it will build a plant to manufacture a full line of cord and fabric tires and mechanical goods, including a pneumatic inner tube that will not become deflated when punctured. The officers are: J. H. McWade, president; C. C. Cox, vice-president and general manager; H. G. Vincent, secretary and treasurer.

THE RUBBER TRADE IN THE MID-WEST.

MID-WEST RUBBER MANUFACTURERS' ASSOCIATION.

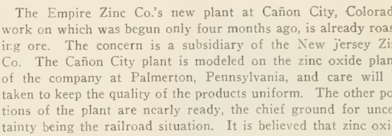
The recent bulletins of the Mid-West Rubber Manufacturers' Association have contained much material of interest to members; the weekly review of the crude rubber market and the special topics have been of timely interest. Some of these are: a report on employment in the automobile industry, in April, 1920; a plea for reduction of prices leading to an increase of business; a quotation from the bulletin of the First National Bank of Philadelphia, in which William A. Law, president of that institution, points out the difficulties of efficient banking to-day due to the shortcomings of the postal system; and the decision of the Council of National Defense not to urge early buying and storing of coal, because of the existent difficulties of transportation.

The next meeting of the Association will be held on July 13 in the Chicago Athletic Association Building, 12 South Michigan avenue, Chicago, Illinois.

The Cutler-Hammer Manufacturing Co., Milwaukee, Wisconsin, and New York City, has removed its Chicago office from the People's Gas Building to its own building at 323 North Michigan avenue. H. L. Dawson is manager of the Chicago office, which handles the business of nineteen states with sub-offices in Cincinnati and Detroit.

The Empire Zinc Co.'s new plant at Cañon City, Colorado, work on which was begun only four months ago, is already roasting ore. The concern is a subsidiary of the New Jersey Zinc Co. The Cañon City plant is modeled on the zinc oxide plants of the company at Palmerton, Pennsylvania, and care will be taken to keep the quality of the products uniform. The other portions of the plant are nearly ready, the chief ground for uncertainty being the railroad situation. It is believed that zinc oxide will be produced at the plant much sooner than was expected.

The Latex Tire & Rubber Co., Fond du Lac, Wisconsin, has completed its new plant and office building, including the main factory building, 50 by 150 feet, two stories high, and the power


Plant of Latex Tire & Rubber Co.

plant, 50 by 40 feet. The factory is located on East Scott street and is equipped with up-to-date machinery. It is planned on the unit system and other units will be added as the business develops. F. S. Danenberg is president of the company.

The Majestic Tire & Rubber Co., Indianapolis, Indiana, has elected the following officers: R. H. Syfers, president; E. B. Oscars, vice-president; and George O. Wildhack, secretary-treasurer.

The Miller Rubber Co., Akron, Ohio, has opened a branch at 3 East Water street, Milwaukee, Wisconsin, where 30,000 feet of floor space have been leased and a preliminary shipment of twelve carloads of tires made.

The Parker Tire & Rubber Co., Indianapolis, Indiana, has increased its capital from $750,000 to $3,000,000, and is drawing up plans for the erection of a new factory building 600 feet long, 100 feet wide, and two stories high. When completed and equipped, it is estimated that the company will have a capacity of 2,000 tires daily. The company emphasizes white in every possible way in connection with its business, its letterhead even having the name embossed with a die instead of the usual printing.

The Rubber Sales Co., 53 West Jackson Boulevard, Chicago, Illinois, has been recently organized for the purpose of marketing various rubber products pertaining to the automobile industry in Chicago and the Middle West. F. E. Kaeppel, formerly with the Federal Rubber Co. and the Mechanical Rubber Co., is president. The company acts as direct mill agents.

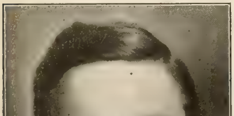
The Tong-em-on Vulcanizer Co., Minneapolis, Minnesota, has changed its name to Risk's Riskless Vulcanizer Co., as also the name of its product, which was described in The India Rubber World April 1, 1920, under the old name.

The Wildman Rubber Co., 816 Book Building, Detroit, Michigan, has purchased the controlling interest in the Biltwell Tire & Rubber Co., Akron, Ohio, as noted elsewhere in this issue. The Wildman company will operate the Biltwell plant in addition to the one it is to erect at Bay City, Michigan.

The Morgan & Wright plant, Detroit, Michigan, is being enlarged by the addition of a two-story building, 90 by 275 feet, and a power plant.

SALES MANAGER, SAVAGE TIRE SALES CO.

John Elden Shaw, sales manager of the Savage Tire Sales Co., Des Moines, Iowa, was born in Saylesville, Rhode Island, September 21, 1886. After completing his education in a business college he became a newspaper reporter, which is a valuable training preparatory to any sort of business career.



John E. Shaw.

His first experience with the rubber industry commenced some ten years ago with the L. A. Vulcanizing Co., of Los Angeles, California. Early in 1914 he started with the Savage Tire Co., of San Diego, California, as credit man in the Los Angeles branch, later being transferred to the factory as credit manager, then promoted to traveling auditor and soon to special salesman. In February, 1918, he was appointed assistant sales manager, and eleven months later was advanced to sales manager. In this position he greatly increased sales and changed the company's policy from a consignment to a straight sales basis, and on February 1, 1920, resigned to go into business for himself.

Mr. Shaw has a wide acquaintance in social and fraternal as well as business circles and is a member of the B. P. O. Elks No. 168 of San Diego.

THE RUBBER TRADE ON THE PACIFIC COAST.

By Our Regular Correspondent.

LOS ANGELES NOTES.

Los Angeles is the largest city west of St. Louis, according to the United States census returns for 1920, which gives the population of Los Angeles as 575,480, in contrast with that of San Francisco, which has 508,410.

Another large rubber plant is coming to Los Angeles. It is the Fabri-Cord Tire Company of California, which has purchased thirty acres adjoining the Vista del Oro tract on Seventh street in the San Pedro harbor section of the city, and construction will begin August 1 on a plant that will ultimately cost $2,000,000. The first unit will be a three-story building of reinforced concrete, 60 by 250 feet, costing when equipped, $80,000 for the building and $200,000 for the machinery. The initial output will be 500 cord tires and 1,500 tubes a day, and 400 men will be employed. Eventually the company plans to employ 1,700. Electricity will be used wholly for power.

The E. M. Smith Co., Los Angeles, manufacturer of Emsco products consisting of rubber belting, brake linings, clutch facings and other rubber-asbestos and textile products is a twelve-year-old concern of which E. M. Smith is president and general manager. The factory buildings now built and under way are of reinforced concrete and include a rubber mill, a textile mill, a power plant, garage, machine shop, belting factory, warehouse and offices. The plant is the only one west of Chicago making clutch facings for automobiles. It uses more than 25,000 pounds of canvas monthly and it is all bought in California. Emsco products are being shipped to Arizona, Texas, New Mexico, Wyoming, Oklahoma, Kansas, and other states as far east as Philadelphia.

Calender Room, E. M. Smith Co.

Goodyear tires are being made in California. The first "native son" tire to be made in the Golden State and bearing the "Wingfoot" brand was turned out at the Los Angeles factory on June 14, 1920. As the casing was removed from the molds and pronounced perfect, the whistles of five Goodyear factories, namely, in Los Angeles, Akron, Ohio, Toronto, Canada, the cotton mills at Goodyear, Connecticut, and the ginning mills on the Goodyear cotton plantation in Arizona, in unison greeted the birth of the tire. It is a model 30 by 3-inch, plain tread, single-cure fabric tire of the clincher type and will be placed in the Goodyear Products Museum in Akron.

The severest test of solid truck tires ever made in this section took place recently when a 73-ton, 40-inch naval gun was transported from the Southern Pacific railroad freight yards at San Pedro to Fort McArthur, adjoining Los Angeles harbor. The huge gun was so placed that 23 tons rested on dollies and the remaining 50 tons on a single trailer, which is believed to be the greatest weight ever imposed on solid tires. Two 40 by 12 solids were used on the front wheels and four 40 by 10 solids on the rear wheels of the trailer, all Goodrich tires.

Rubber-tired auto vans have replaced the horse-drawn mail carts in Los Angeles, the postoffice department having just installed thirty-seven of the motor vehicles. There are nineteen 1-ton, thirteen ¾-ton, three 2-ton, and two 2½-ton vans now in use.

W. D. Newerf, W. S. Melcher, and Carl Newerf have formed the Tire Sales Company to market in Los Angeles the Western States tires made by the Washington Tire & Rubber Co., Spokane, Washington.

While no affirmation or denial has been made by the Miller Rubber Co., Akron, Ohio., of the rumor current here for several months that it intended to build a large plant in Los Angeles, the impression persists that the company is maturing plans to that end. F. C. Millhoff, general sales manager, and W. S. Campbell, advertising manager, of the Miller company, have been spending much time lately in this section.

The U. S. Compression Inner Tube Co., Inc., Tulsa, Oklahoma, in addition to its new plant acquired in Pennsylvania, will build another this winter on a site to be purchased immediately in Los Angeles. From this it will serve its customers in the territory west of the Rockies, and from Tulsa, those between the Rockies and the Mississippi.

It is estimated that the annual bill for tires for the 1,500 motor stages operated daily over the fine highways of California is not less than $1,200,000. The average run for each is 150 miles a day, and a mileage of 12,000 is figured for each of the five tires carried.

New Plant, Samson Tire & Rubber Corporation.

Roy R. Meads, president and general manager of the Pacific Rubber Co., has returned to Los Angeles from a visit to the Horseshoe tire factory in Racine, Wisconsin, and a visit to the various distributing agencies of the company on the Pacific coast.

W. J. Coe, of the United States Rubber Company's Los Angeles branch, attended the annual convention of the California Retail Shoedealers' Association which opened at San Diego on June 7.

Bert Mooser, who is the Pacific Coast representative of the India Tire & Rubber Co., Akron, Ohio., has gone East to hurry up tire shipments. Local distributers have been seriously hampered by depleted stocks.

J. Ralph Campbell, long with The Fisk Rubber Co., has been appointed manager of Guasti, House & Giulli, Inc., Los Angeles, southwestern distributer of Perfection tires. Mr. Campbell recently visited the Perfection plant at Fort Madison, Iowa.

J. A. Peterson has succeeded J. R. Campbell as manager of the Los Angeles branch of The Fisk Rubber Co., Chicopee Falls, Massachusetts. For a little more than three years he has been manager of the company's branch at Sacramento where J. A. Jack, a salesman for the last three years, has been appointed manager.

Tire users have been greatly interested in an animated cartoon recently shown here that depicted a supposed strike of abused tires against unreasonable use by their owners. The film was entitled, "The Striking Tire" and was supplied by The B. F. Goodrich Co., Akron, Ohio., as part of the nation-wide campaign against the neglect and misuse of tires.

J. B. Magee, general manager of the United States Rubber Company's southern California and Arizona branches, has been making a thorough study of trade conditions in the northern part of California, first with J. B. Brady, Pacific Coast manager, at San Francisco and afterward as far as Klamath Falls, Oregon, with T. H. Wilkinson, manager for that section, and L. M. Simpson, manager of the Sacramento branch.

The George W. Eno Rubber Co., Los Angeles, has purchased the mold for the Ehman half-sole tire from the Ehman Tire & Rubber Co., and is just concluding experiments looking toward applying this mold to a whole-sole tire which the Eno company will soon turn out in quantity under its own name.

Employes of the Los Angeles Goodyear tire plant have organized a 60-piece band under the leadership of Frank Marsales, who also heads the Elks' band in Los Angeles. The Goodyear employes have also organized a baseball team, and thus far they have won 10 of the 12 games played.

It has been claimed that half of the automobile tires made in the United States are sold west of the Mississippi river. Asked by The India Rubber World representative whether such a statement was true, an official of one of the largest tire-making concerns in the country stated that his company's sales in the fourteen states nearest the Pacific Coast and all the Pacific exports total but 10 per cent of the company's entire business.

A PIONEER TIRE CO.

A prosperous young company is the Samson Tire & Rubber Corporation, whose general offices are at 333 West Pico street, Los Angeles. Although launched during the war, it has flourished remarkably. It has a plant at Compton, a nearby city, and is running it up to capacity.

The first unit of the new plant now under way is a three-story brick building of mill construction 50 by 200 feet. Besides the batteries of machines, mixers and calenders, there will be big press-vulcanizers and the latest machines and devices for tire work. The plant will be on a main line of railroad and have its own siding. There is plenty of water, cheap electric power, and a fine class of help always available.

The officers are especially proud of the fact that the plant is free and clear, that the company has no bonds or preferred stock, and that it discounts all purchases.

The Samson concern is said to be the pioneer on the Pacific Coast in the making of full-modeled, modern constructed, supersized cord tires, facilities having been provided for turning out all sizes up to 38 by 5; and all in addition to a wide variety of standard tires.

SAN FRANCISCO NOTES.

J. W. Thomas, vice-president of the Firestone Tire & Rubber Co., and three of the factory engineers, J. C. Tuttle, A. A. Warner and L. G. Greenwald, have just completed a prolonged survey of the automobile industry on the Pacific Coast, with especial reference to road and traffic conditions affecting tire products, solid and pneumatic. Incidentally Mr. Thomas has been giving inspiring talks to Firestone tire distributers at luncheon-conferences in several coast cities.

H. P. Lawson has been appointed assistant district manager for the San Francisco branch of the Willard Storage Battery Company. Mr. Lawson, who has been with the Willard concern four years, is well-known and popular among the trade.

L. E. Crittenden has bought a half interest in the Tire Sales Company formerly owned solely by Johanna Pulver and D. P. Miles.

NORTHWESTERN NOTES.

With the first cargo of rubber brought to the northwest port since the Pacific Steamship Company established its service between Seattle and Singapore a few months ago, the Admiral line freighter *West Hartland* arrived at Seattle June 10. Since 1918, the record year in Seattle's import and export trade, most of the rubber from Singapore has moved through Gulf and Atlantic ports.

W. D. Albright, of Seattle, northwestern distributer for The B. F. Goodrich Rubber Co., has broken all records in tire shipments to the Pacific Coast. He induced his company to send a trainload of tires on May 29 from the Akron factory to relieve a pronounced shortage in the Northwest, which is felt by all dealers.

The Michelin Tire Co. has leased a two-story building at 41 Front street, Portland, Oregon, from which C. L. Normyle, branch manager, will supervise Michelin sales all over the Northwest through sub-branches at Seattle, Spokane, Butte, Great Falls and Boise.

The Emery Retread Co. will erect a three-story modern tire service building at 1115 East Pike street, Seattle.

John A. Leatherman, J. M. Albert, and R. W. Huntoon, of Seattle, have incorporated the Leatherman Tire & Rubber Co. with $2,000,000 as authorized capital.

The first unit of the new factory of the Occident Rubber Co., Kirkland, Washington, has been completed and $20,000 worth of up-to-date machinery has been installed. Work has also been started on a second building, the two to cost $150,000. While the company will for a while continue to make a general line of rubber goods, it is also planning to turn out automobile tires later in the year.

SOUTHWESTERN NOTES.

What is practically an addition to the cotton acreage of Arizona is the new plantation being developed just across the Mexican border, where Harry Mount, president of the El Tigre Oil Co., Tampico, Mexico, and Arturo de la Torre, Mexico City, have taken title to several thousand acres of land in Sonora on the eastern bank of the Colorado river and extending from Arizona to the Gulf of California. The sale was made by the heirs of the Andrade estate who live in Los Angeles. Long-staple cotton will be planted at once and experts say the section is ideally suited for such a crop.

Owing to scarcity of labor in Imperial Valley, some cotton growers are paying as much as $1 an hour to Hindu cotton-choppers.

The Spreckels "Savage" Tire Co., San Diego, has for a second year been granted the exclusive concession for the sale of tires and tubes in Yosemite National Park.

Through its purchase from Miller & Lux of the Bottonwillow 100,000-acre ranch thirty miles west of Bakersfield, the Goodyear Tire & Rubber Co. will become, it is said, the largest cotton-raising concern in the world. The big California tract, like the others owned by the Goodyear concern in Arizona, will be planted to Pima long-staple cotton needed for tire fabric.

According to F. W. Griffeth, vice-president of the Garlock Packing Co., Palmyra, New York, his company is considering the building of a western factory in Los Angeles.

THE TOWN OF LITCHFIELD.

Military triumphs in the olden days resulted in naming cities after great leaders, as Rome after Romulus, Constantinople in honor of Constantine, and so on. To-day industrial leaders receive a like honor. Thus Paul W. Litchfield, one of the most

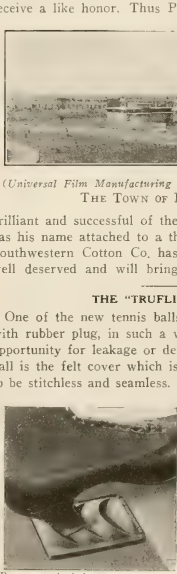
(Universal Film Manufacturing Co.)
The Town of Litchfield, Arizona.

brilliant and successful of the latter-day rubber superintendents, has his name attached to a thriving town in Arizona where the Southwestern Cotton Co. has its headquarters. It is an honor well deserved and will bring good fortune to the community.

THE "TRUFLITE" TENNIS BALL.

One of the new tennis balls is made with a four-piece center with rubber plug, in such a way, it is claimed, that there is no opportunity for leakage or deflation. The special feature of this ball is the felt cover which is applied by a special process so as to be stitchless and seamless. The "Truflite" tennis ball was approved by the United States National Lawn Tennis Association in February of this year. (The Seamless Rubber Company, Inc., New Haven, Connecticut.)

ACCELERATOR HEEL REST.



(Patent applied for.)
"Essex" Heel Rest.

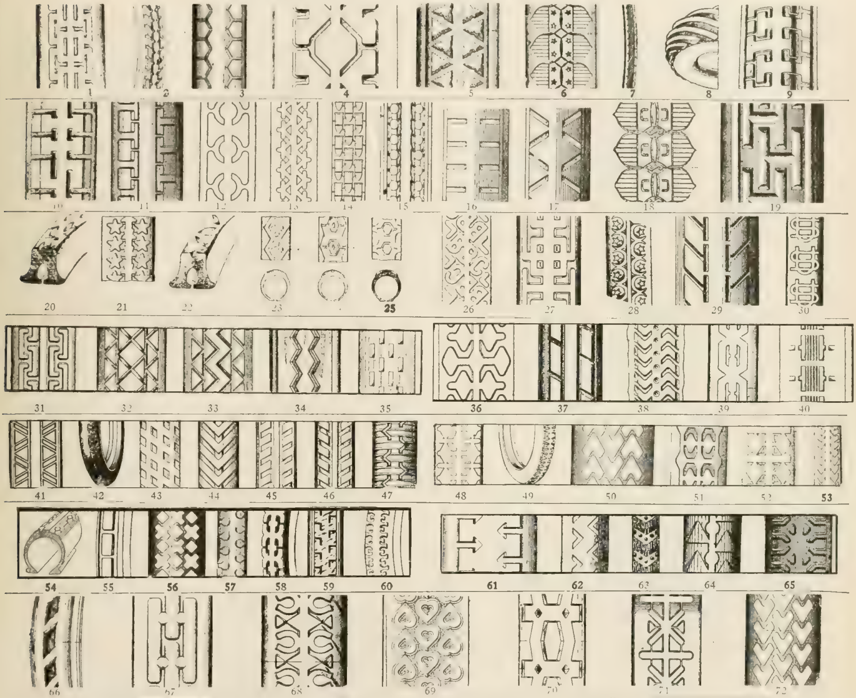
A heel rest for use by automobile drivers provides deep curved recesses of rubber for the heel to brace against, so that the pressure on the heel is not at the extreme end but is flung forward where it naturally would come when walking. The curve prevents the heel from slipping sideways and offers real support. The "Essex" heel rest comes packed ten in a carton. A patent on this device has been applied for. (Essex Rubber Company, Trenton, New Jersey.)

PROTECTIVE RUBBER BLANKET FOR ELECTRIC LINEMEN.

A blanket intended for use by electric linemen in repairing cross-country high-voltage lines is composed of special character duck coated on both sides with a rubber compound to resist high voltage. The edge is beaded on all four sides to strengthen it and prevent tearing, and the material is extremely pliable. The blanket measures 35¼ inches square and weighs from 5½ to 6 pounds. (W. H. Salisbury & Co., Inc., 308-310 West Madison street, Chicago, Illinois.)

Pneumatic Tire Tread Designs.

September, 1918, to September, 1919.



Cut No.	Patent No.	Patentee or Assignee and Address.
(1).	52,114.	The Long-Wear Rubber Co., Elyria, Ohio.
(2).	52,116.	B. H. Pratt, Milwaukee, Wis.
(3).	52,122.	S. R. Vasbinder, Fulton, Ill.
(4).	52,153.	The Star Rubber Co., Akron, Ohio.
(5).	52,170.	W. C. Owen, Cleveland, Ohio.
(6).	52,178.	H. A. Phillips and J. G. Stamm, Cleveland, Ohio.
(7).	52,224.	Indiana Rubber & Insulated Wire Co., Jonesboro, Indiana.
(8).	52,227.	J. W. Richardson, Detroit, Mich.
(9).	52,232.	A. E. Wing, Cleveland, Ohio.
(10).	52,266.	The Rubber Products Co., Barberton, Ohio.
(11).	52,298.	Armstrong Rubber Co., Newark, N. J.
(12).	52,303.	A. E. Pearce and H. H. Swan, Ashtabula, Ohio.
(13).	52,304.	A. E. Pearce and H. H. Swan, Ashtabula, Ohio
(14).	52,306.	United States Tire Co., New York City.
(15).	52,329.	The Fisk Rubber Co., Chicopee Falls, Mass.
(16).	52,430.	Ajax Rubber Co., Inc., Milbrook, N. Y.
(17).	52,431.	Ajax Rubber Co., Inc., Milbrook, N. Y.
(18).	52,459.	H. A. Phillips and J. G. Stamm, Cleveland, Ohio.
(19).	52,573.	H. H. Hewitt, Buffalo, N. Y.
(20).	52,650.	The Goodyear Tire & Rubber Co., Akron, Ohio.
(21).	52,686.	The Star Rubber Co., Akron, Ohio.
(22).	52,701.	The Goodyear Tire & Rubber Co., Akron, Ohio.
(23).	52,702.	A. Kanzee, Berkeley, Calif.
(24).	52,703.	A. Kanzee, Berkeley, Calif.
(25).	52,704.	A. Kanzee, Berkeley, Calif.
(26).	52,893.	The Brunswick-Balke-Collender Co., Chicago, Ill.
(27).	52,899.	The McGraw Tire & Rubber Co., East Palestine, Ohio.
(28).	52,959.	W. A. Miller, Columbus, Ohio.
(29).	52,962.	A. L. Pashek, Newark, N. J.
(30).	52,975.	United States Tire Co., New York City.
(31).	52,725.	Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., Can.
(32).	52,731.	T. J. Edwards, Akron, Ohio.
(33).	52,732.	T. J. Edwards, Akron, Ohio.
(34).	52,749.	The Goodyear Tire & Rubber Co., Akron, Ohio.
(35).	58,822.	H. H. Hazeltine, Tacoma, Wash.
(36).	53 006.	J. & D. Tire Co., Charlotte, N. C.
(37).	53,066.	F. S. Dickinson, New York City.
(38).	53,070.	The Miller Rubber Co., Akron, Ohio.
(39).	53,083.	Norwalk Tire & Rubber Co., Norwalk, Conn.
(40).	53,096.	The Dayton Rubber Manufacturing Co., Dayton, Ohio.
(41).	53,100.	A. E. Braden, Tacoma, Wash.
(42).	53,108.	Converse Rubber Shoe Co., Malden, Mass.
(43).	53,111.	W. R. Blowers, Omaha, Neb.
(44).	53,112.	W. R. Blowers, Omaha, Neb.
(45).	53,113.	W. R. Blowers, Omaha, Neb.
(46).	53,114.	W. R. Blowers, Omaha, Neb.
(47).	53,116.	Combination Rubber Manufacturing Co., Bloomfield, N. J.
(48).	53,129.	The McGraw Tire & Rubber Co., East Palestine, Ohio.
(49).	53,133.	The Gordon Tire & Rubber Co., Canton, Ohio.
(50).	53,143.	The Oldfield Tire Co., Cleveland, Ohio.
(51).	53,146.	J. & D. Tire Co., Charlotte, N. C.
(52).	53,151.	C. P. L. Huston, Plainfield, N. J.
(53).	53,190.	Wicks' Tire & Rubber Products Co., Seattle, Wash.
(54).	53,223.	E. Hopkinson, New York City.
(55).	53,278.	Washington Rubber Co., Washington, Pa.
(56).	53,279.	Firestone Tire & Rubber Co., Akron, Ohio.
(57).	53,292.	E. H. Cooper, Kansas City, Mo.
(58).	53,316.	The General Tire & Rubber Co., Akron, Ohio.
(59).	53,331.	The Gates Rubber Co., Denver, Colo.
(60).	53,372.	Iowa Cord Tire Co., Des Moines, Ia.
(61).	53,494.	Hood Rubber Co., Watertown, Mass.
(62).	53,653.	W. B. Buckley, Washington, D. C.
(63).	53,511.	A. L. Weeks, Gadsden, Ala.
(64).	53,555.	C. R. Baker, Akron, Ohio.
(65).	53,553.	G. S. Anderson, Akron, Ohio.
(66).	53,410.	Revere Rubber Co., Providence, R. I.
(67).	53,427.	The B. F. Goodrich Co., New York City.
(68).	53,479.	Racine Auto Tire Co., Racine, Wis.
(69).	53,498.	M. Greenspan, Chicago, Ill
(70).	53,589.	B. W. Hartley, Halleybury, Ont
(71).	53,608.	S. Reele, Houston, Tex
(72).	53,661.	The Oldfield Tire Co., Cleveland, Ohio

The Rubber Trade in Great Britain.

By Our Regular Correspondent.

A POINT about the increasing prices of rubber goods, notably those in which cotton and other high-priced materials figure largely, has been brought forcibly to my attention. This is that large buyers such as the big manufacturing combines are not replacing their rubber goods so frequently as has been their wont. They have discovered that where more care is taken of them their life and utility can be made to last longer; in other words, they are getting more work out of them, and subordinates have been instructed to fall in line with the new policy. I met a rubber manufacturer recently who was taking quite a gloomy view of this new procedure which had led to certain customary orders being adjourned to some future date. This cannot, fortunately, have anything to do with the Greek Calends because with the most careful usage rubber manufactures have only a finite life.

The centenary of the foundation of Thomas Hancock's rubber works in Goswell road falls in the present year, and it is interesting to hear that the directors of the present company are recognizing the event by reprinting his "Personal Narrative" of the origin and progress of the "Caoutchouc or India-Rubber Manufacture in England." I do not know whether there has been a previous reprint, but the date of publication of the copy in my possession is 1887. No doubt there will be many among the younger rubber chemists, if not among those of mature years, who will be glad of the opportunity of possessing a copy of the book.

THE PROOFING TRADE.

The fall which has taken place in the price of seed oils is somewhat slow in its effect on the price of rubber substitutes, no change to the advantage of the buyer of the latter having occurred at the time of writing. Of course the increased cost of substitutes is not all attributable to oil values, as labor and chemicals are also up. With regard to vulcanizing, although sulphur may be expected to come down, there seems little likelihood of bisulphide of carbon and chloride of sulphur following in its wake. This bears upon the relative cost of the dry-heat and cold-cure processes. At one time the cold cure was decidedly the cheaper of the two, but now they are much the same and it has become customary to take the costs of the two processes as similar in works calculations.

Recrimination between the cloth supplier and the waterproofer, where there is any complaint by the purchaser of the finished article, is a well worn theme, each in perfect faith putting the blame upon the other. One or two cases which have given rise to the customary amenities have been associated with khaki-dyed cloth as a component part of rubber-proofed clothing, and altogether the defects seem trivial enough. Nothing is alleged against the waterproof properties of the garments, the complaint being limited to the fact that when tested with water by the special method adopted by the purchaser some alteration in the tint of the khaki color takes place. With regard to the various methods used by purchasers to test waterproofs, it certainly seems desirable that some standard test should be adopted and also that this test should be specified and particularized when the goods are being contracted for. As it is, the person is at a disadvantage in not knowing to what test if any the goods are to be subjected.

Reports from the works indicate that as regards new business, slackness is somewhat prevalent, and this may be taken as supporting the statements emanating from other trades to the effect that the populace is not spending money so freely as was the case a year ago. It must be remembered in this respect that the millions distributed among officers and men have now been spent, except in those few cases where the gratuities were invested.

Another instance where the making-up side of the business is to be carried on by a separate company associated with the rubber works is that of the Premier Waterproof and Rubber Co., Limited, of Manchester. A new company called Premier Garments, Limited, has been registered with a capital of £90,000 in £1 shares, of which 80,000 are cumulative preference, to take over the making up and selling of the waterproof garments and piece goods of the above company. Until the new premises are ready for occupation the new company will conduct its business from the rubber works. W. Lilley is on the board of both companies.

The police in some of our smokiest towns are now being supplied with the well-known white, single-texture mackintoshes worn in the past almost exclusively by coachmen. They are certainly more conspicuous than the ordinary dark blue or black coats hitherto worn, but it is to be hoped that the makers will not be held responsible if the white color undergoes a change.

The report of J. Mandleberg & Co., Limited, the Manchester waterproofing house, for 1919 is of the usual satisfactory nature, the distribution on the ordinary shares including a bonus of 7½ per cent, being 22½ per cent. As in many other businesses the high cost of materials and the necessity for expansion to cope with new business have made it imperative to issue further capital and it is proposed to issue a further 150,000 ordinary £1 shares and also to create 150,000 eight per cent preferred ordinary shares. These shares are to be offered at par to directors and others engaged in the management of the company at the directors' discretion.

SOCIETY OF CHEMICAL INDUSTRY'S ANNUAL REPORTS.

The volume for 1919 is now at hand, and, as was the case in 1918, the chapter dealing with progress in the rubber industry is from the pen of Dr. Twiss, chief chemist of the Dunlop Rubber Co., Limited. He mentions that now the war is over, details referring to manufactured goods are more frequent, and gives footnote reference to various papers that have been published in THE INDIA RUBBER WORLD. To the busy man who, despite the best intentions, cannot always manage to keep up with the flow of technical literature, the summary given by Dr. Twiss of the scientific papers relating to the industry published during the year will be found very useful. Rubber patent literature as such is not specially dealt with, perhaps because of the dreary monotony of the rubber-like bodies made from fish, tar or what not, and which the inventor rarely lives to see in regular use. The tendency of fine powders, such as precipitated barium sulphate, to become coarser under the mixing process is specially referred to in connection with Harting's United States patent covering the use of minced powders in the form of a paste with water or other liquid. Dr. Twiss, however, thinks that the practical difficulties in the way of doing this appear to be serious, though he suggests that glue and other colloids might usefully be applied in the form of an aqueous jelly. Referring to the use of glue in rubber, Dr. Twiss quotes American practice without saying whether it is used in Europe.

FUSION OF TIRE MAKING AND COTTON SPINNING INTERESTS.

It is announced that Belgrave Standard Tyres, Limited, of Oldham, has acquired a controlling interest in the Beldam Tyres, Limited, of Brentford, near London. Other firms in this fusion are the Belgrave Mills Co., Oldham, the Standard Tyres Co., Oldham, the Standard Tyre and Rubber Manufacturers, Limited, of London; the spinning and manufacturing

concerns of Robert McLure and Sons, Limited, of Stockport and J. and W. Bourne, Limited, of Highton, near Preston. It would seem from this that the tire making part of the combine will have no need to go short of textile fabric.

GALOSHES.

The position as regards retailers' supplies is very different from what it was a year ago. The erstwhile scarcity has given place to plentiful stocks which at the end of the winter season are causing some little perturbation to the retail rubber stores. As the winter was very mild throughout and there was hardly anything in the way of a snowfall, sales have not been up to the average. It might have been thought that the extremely wet period of April and the first three weeks of May would have led to increased sales, but this has not been the case. The British seem as conservative as ever as regards their limited use of galoshes; there is only a run on them in times of heavy snowfall, and they are not used for rain, even in these days of expensive and often leaky boots. Of course galoshes are more expensive than they were, the ruling price to-day being 10 shillings for men's and 7 shillings, sixpence for ladies'. A large number of these are Canadian, which seem to have ousted the American brands so well known in pre-war days. I am told that the American are now too expensive and also that the high price of the Canadian is due to freight and duty, or at any rate to costs over and above those of manufacture. The price of the Canadian and British galoshes is the same.

RUBBER GROWERS' ASSOCIATION PRIZES.

The Rubbers Growers' Association, Inc., London, offers prizes amounting to £5,000 for new ideas and for encouraging new uses of rubber; a first price of £1,000, three prizes of £500, and ten premiums of £100 each. A sum of £1,500 in addition will be divided among other competitors who may offer ideas of value. Suggestions must be in by December 31, 1920. They must be practical and likely to increase the demand for the raw material.

Competitors are required to give: (1) a brief description of the idea; (2) a full, detailed description, with explanations, samples, diagrams and designs, so as to make it possible to work out the idea; (3) a statement of the facts on which the idea is based and of the special advantages the competitor has had for acquiring his knowledge; (4) any available information about cost, demand and the quantity of raw rubber likely to be needed; (5) whether the idea is partly or wholly original or not; and (6) whether it is covered in any way by patents or if patents have been applied for.

Entries should be addressed to The Rubber Growers' Association, Prize Competition, care of Fitzpatrick, Graham & Co., 95a Chancery Lane, London, W. C. 2.

FOREIGN TARIFF NOTES.

Lithuania admits crude rubber free of duty, but imposes a duty of 20 per cent ad valorem on india rubber products.

Malta's new preferential tariff in favor of Great Britain reduces the 15 per cent ad valorem duty on all rubber goods, now in force, to 10 per cent, for those of British manufacture.

France (April 23) forbids the importation of dress shields, suspenders, garters and belts; manufactures with mountings of rubber or celluloid, and fountain pens.

Australia's revised tariff, in force March 25, 1920, permits the free importation of crude, waste, reclaimed, and masticated rubber; hard rubber in sheets, rubber thread and elastics. It increases the duty on rubber belting, hose, mats, druggists' sundries, other manufactures of rubber and rubber substitutes, and tires and tubes to 40 per cent ad valorem; but pneumatic tires weighing 2½ pounds or over and tubes weighing one pound or over must pay 2*s.* 6*d.* a pound, if that amounts to more than the ad valorem duty. The preferential rates for British manufactures are 25 per cent. For rubber shoes the duty is 35 per cent, preferential 25 per cent; for rubber boots 10 per cent, British free. Insulated wire and cables 15 per cent, British free.

The Serb-Croat-Slovene State, of Jugoslavia, on March 19, 1920, prohibited the importation of rubber or part rubber boots and shoes, floor cloths and mats, toys and articles of soft or vulcanized rubber, hard rubber or gutta percha, or wholly or partly covered, coated, or saturated with rubber, if combined with the finest materials or precious metals.

Austria requires an export license for raw, reclaimed, or waste rubber, and for pneumatic tires and insulated wire and cables.

Germany, since February 28, 1920, requires licenses for the exportation of crude and purified rubber, gutta percha and balata; rubber, gutta percha and balata scrap and waste; and rubber substitutes. Furthermore for all manufactures of rubber, or partly of rubber export licenses are required.

Persia and Great Britain have formed a new commercial agreement which went into effect April 2, 1920. By it crude rubber enters Persia free; if prepared, in slabs, sheets or threads, it pays a duty of 3 kran a batman (21 cents on 6½ pounds). Rubber shoes pay 5 kran (35 cents) a batman, but if the rubber is combined with textiles which are more valuable than the rubber, the shoes rank as clothing and pay 15 per cent ad valorem. Tissues covered with rubber pay 10 per cent, and all other manufactures, including tires for bicycles or vehicles, 12 per cent ad valorem. All these goods must pass through specified custom houses, except by special permission.

EUROPEAN NOTES.

Pirelli & Co., of Milan, Italy, made net profits of 5,420,000 lire in 1919, paying dividends of 55 lire per share. The company has decided to increase its share capital from 40,000,000 lire to 60,000,000 lire. One lira equals $0.193.

A cable manufacturing company has been started at Södertälje, not far from Stockholm, Sweden, by the A. B. Svenska Maskinverken with a share capital of 18,000,000 kroner, the mother company retaining 8,000,000 kroner of the amount. A krona equals about $0.27 United States currency.

France imported 32,455 metric tons of rubber in 1919 as against 19,927 tons in 1918, the values being 216,130,000 francs in 1919 and 113,578,000 francs in 1918. Of this amount 12,638 tons came from English ports, 3,235 tons from Brazil, 516 from French Congo, 321 from Senegal, 1,000 from the west of Africa, 8,264 from the British Indies and 6,481 tons from other countries. Besides this 11,722 tons of manufactured rubber goods were imported in 1919, including tires, tubes, shoes, clothing, bandages, tubing and so on, worth 221,134,000 francs. A large proportion came from the United States.

American automobile tires are in demand in Constantinople, the prices, even at the present rates of exchange, being apparently no obstacle. Salesmen who could not sell tires in France have disposed of them in the Turkish capital.

Kan & Kan, dealers in rubber, asbestos, etc., have removed from Doetinchem, to 17 Utrechtschestraat, Arnhem, Netherlands.

The India Rubber Products Co., Limited, 47-48 Farringdon street, London, E. C. 4, a branch of the United States Rubber Co. and associated companies, has now registered for the future conduct of its business as the "United States Rubber Co., Ltd." Other offices are maintained at Birmingham, Liverpool, and Glasgow.

Rubber was honored by King George V. through the inclusion, among the birthday honors for this year, of knighthood for Sir Henry Alexander Wickham, who forty-odd years ago, conveyed from Brazil to England the seeds of *Hevea* which were used to start the Ceylon and East Indian rubber plantations.

NETHERLAND INDIES NOTES.

RUBBER ACREAGE IN THE DUTCH EAST INDIES.

A very careful inquiry into the acreage devoted to rubber in the Dutch East Indies in the year 1918 has been made by the Trade division of the Department of Agriculture, Industry and Commerce (*"Landbouw, Nijverheid en Handel"*), Netherlands India officially is divided into two parts, "Java and Madura" and "the Outer Possessions," which latter include Sumatra, Borneo, Celebes, New Guinea and the lesser islands of the East Indian archipelago. The investigators, for scientific reasons, distinguished between the estates devoted to rubber alone and those which raised mixed crops, and also took account of the different kinds of rubber trees planted. The figures follow, areas being given in hectares:

	Number of Estates	Planted Areas	Productive Areas.	Hevea Brasiliensis.	Ficus Elastica.	Manihot.
		I. Planted With Rubber Only.				
Java	76	28,629	20,940	28,041	427	161
Outside	[1]161	109,398	76,571	108,703	695	...
		II. Rubber and One Other Crop.				
Java	50	11,390	5,696	10,239	634	517
Outside	50	21,802	13,481	20,829	973	...
		III. Rubber and Two Other Crops.				
Java	11	1,001	388	953	34	14
Outside	10	4,715	2,021	4,484	231	...
		IV. Rubber and Three or More Other Crops.				
Java	6	343	4	97	231	14
		V. Mixed Crops.				
Java	250	79,727	25,414	....	...	...
Outside	63	16,323	5,332	....	...	...

[1]122 on east coast of Sumatra.

Of the above number of estates with mixed crops, there were 152 in Java and 39 in the outside possessions which had areas planted to rubber only. The figures for these pure rubber acreages were:

	Number of Estates	Planted Areas	Productive Areas.	Hevea Brasiliensis.	Ficus Elastica.	Manihot.
Java	152	31,923	22,572	29,298	2,440	190
Outside	39	14,307	9,324	13,278	1,029	...
		Totals of Tables I-V.				
Java	393	121,100	52,442	38,330	1,326	706
Outside	284	152,238	97.405	134,016	1,899	...
Dutch East Indies	677	273,338	149,847	172,346	3,225	706

The average size of an estate devoted solely to rubber was 376.7 hectares (930.45 acres) in Java and 679.5 hectares (1,678.4 acres) in the outside possessions. Wild rubber, jelutong, gutta percha and the like are not included in the survey, which deals purely with cultivated plantation rubber.

FAR EASTERN NOTES.

The market for bicycle tires in Japan is probably greater than in any country of equal population. Not many Japanese can buy automobiles or motorcycles, but nearly every one can afford the cheap bicycles made in Japan. The imports of tires, which amounted to $519,330 in 1913, were $559 in 1918; the cause is the cheapness of the domestic article—the cheapest tires cost $2.65 and the dearest $6.50, while imported tires must pay a duty of $42.75 on 100 pounds.

The Japanese rubber plantations in Malaya are chiefly in the State of Johore and are about 93,803 acres in extent.

Burma's exports of rubber during the war years and since have been as follows: 1919, 4,149,242 pounds, valued $1,520,935 American money; 1918, 2,634,380 pounds ($1,381,943); 1917, 2,301,157 pounds ($1,425,244); 1916, 1,285,984 pounds ($995,611); 1915, 987,392 pounds ($632,594). Of this 67,365 pounds, valued $13,659, were sent directly to the United States in 1919, and 76,246 pounds ($46,623) in 1918.

Motor trucks are coming into general use in Singapore to convey plantation rubber from wharves to stores or from one go-down to another. Auction sales are made subject to delivery within two days, which makes trucks almost a necessity, as the bullock carts are slow and carry only limited loads.

A Norwegian company, the Norsk Sumatra Co., with a capital of 1,800,000 kroner, has undertaken rubber planting in Sumatra.

The oldest rubber plantation in Cochin China was started in 1897, but the large estates date only from 1907. At present there are 49,400 acres planted in Cochin China and about 2,470 acres in the rest of Indo-China; the area is increasing by about 2,500 acres a year. The soil and climate are suitable, labor is plentiful, but capital is lacking.

Ceylon proposes to forbid the importation of all *Hevea* seed from any part of South America, owing to reports that leaf disease is common on the Amazon, as well as in Surinam and British Guiana, where it has practically killed rubber growing. In this it follows the lead of the Federated Malay States, which have prohibited the importation of seed from British Guiana since 1917. The leaf disease was brought to Surinam from Brazil about ten years ago.

Rubber in the Sultanate of Brunei in British Borneo is the chief crop raised for exportation. The business has been in a critical condition since 1918, owing partly to the fall in the price of rubber and partly to the lack of labor. The Brunei native is a good worker, but he takes to fishing or to work in the woods rather than tilling the soil, and, further, does not like to go far from home. The future of rubber depends on the importation of labor, coolie or other, from abroad.

The Selangor Rubber Co., one of the pioneer British rubber companies in the Malay peninsula, is now 21 years old. In 1899, when the bicycle boom was in full swing, but more than twenty years after Wickham had brought the *Hevea* seed from Brazil and Hooker and his assistants had demonstrated how well it could grow in Ceylon, Malaya and Southern India, the company took up 200 acres planted with trees one year old. It now possesses about 2,700 acres and fifteen years ago owned nearly twice as much land. It has turned out over seven million pounds of rubber, worth £1,140,000.

British North Borneo exported 8,801,795 pounds of rubber in 1919, being 50 per cent more than in 1918.

New Zealand expects to provide asbestos for its own needs from native sources. Large deposits of asbestos and of French chalk exist at Takala in Nelson province and also near Matueka.

A British combination of tire manufacturers is planning to build a tire and rubber goods factory at Howick in Natal and to amalgamate with itself the South African Rubber Manufacturing Co., of Johannesburg. It will be a year before they can get to work as the machinery must be sent out from England.

From an estate of 107 acres in Selangor (Federated Malay States), the Tremelbye Rubber Company reports a yield of 705 pounds of rubber per acre for 1919.

AFRICAN NOTES.

In Southern Nigeria many of the Pará rubber trees planted under government supervision have reached tapping age. In the Benin district 250,000 *Hevea* trees have been planted. The export for 1918 amounted to 352,504 pounds, most of it Pará rubber.

Rubber in Uganda is displacing coffee on some plantations; 11,255 acres, with coffee as a side crop, have been planted with Pará trees by European owners. The exports of rubber in 1918 were 253,063 pounds, valued at £12,893; in 1917 they were 108,336 pounds, worth £9,867. The natives also have planted some Pará and a considerable quantity of Ceará.

In Italian Somaliland the raising of *Manihot glaziovii* has begun.

Former German East Africa exported in the fiscal year 1918-19 344,700 pounds of rubber, worth 164,534 rupees.

In 1918 Mozambique exported £1,212 worth of rubber, most of it going to the United States.

In 1913 no American motor car could be found in French West Africa; by the end of 1919 there were 150 passenger automobiles, 80 motor trucks and 15 motorcycles. They are distributed as follows:

	Autos.	Trucks.	Motor-cycles.
Senegal	87	40	1
Upper Senegal and Nigeria	12	11	4
Ivory Coast	26	9	
Dahomey, French Togoland and the Kameruns	25	20	15

SOUTH AMERICAN NOTES.

In Argentina an exposition of North American manufacturers will be held in November next, in the buildings of the Sociedad Rural in Palermo, Buenos Aires. It is designed to bring the attention of South Americans to the products of the United States and has the support of the Chamber of Commerce of the United States in the Argentine Republic.

BRAZILIAN EXPORTS OF RUBBER FOR 1918 AND 1919.

From—	1918.	1919.	To—	1918.	1919.
Manáos ... *tons*	8,262	14,037	Germany ... *tons*	.....	1
Itacoatiara	.....	112	Argentina	127	61
Pará	13,525	17,764	Belgium	.....	22
Ilha	47	96	Denmark	.....	7
Maranhão	16	42	United States	17,886	23,299
Fortaleza	147	485	France	971	2,556
Recife	9	48	United Kingdom	3,341	6,769
Bahia	234	334	Italy	88	1
Rio	82	87	Spain	68	.....
Santos	68	...	Holland	.....	328
Corumba	272	247	Portugal	2	32
			Sweden	.....	15
			Uruguay	179	161
Total ... *tons*	22,662	33,252	Total ... *tons*	22,662	33,252

	Average for 5 Years Before War. 1909-13.	Average for 5 War Years. 1914-18.	1918.	1919.
Totals in tons	38,528	31,367	22,662	33,252
Value in contos	260,473	123,868	73,728	105,537
Value in £1,000	17,020	6,615	3,998	6,240

Of total exports of 33,252 tons in 1919, 53.5 per cent were shipped at Pará, 42.3 per cent at Manáos, 0.4 per cent at Itacoatiara and Ilha, and 4.2 per cent at sundry ports.

BRAZILIAN RUBBER EXPORTS DECLINE.

The total shipments of crude rubber from the ports of Pará, Manáos, and Itacoatiara, Brazil, and Iquitos, Peru, are decreasing, as is shown in the following table:

	1919.	1920.
January ... *pounds*	6,624,915	6,273,039
February	9,242,309	8,162,264
March	9,512,787	6,916,352

The price of this commodity continues to be low, and the effect of the low price is seen in the refusal of merchants to place large orders for forward delivery.

RUBBER DORMANT IN DUTCH AND BRITISH GUIANA.

By Our Regular Correspondent.

It was in 1910-11, during the great rubber boom, that Dutch Guiana contracted rubber fever. Rubber planting was the topic of the day in those days; fortunes were to be made and speculation ran high. The demand on the Agricultural Department for seeds could hardly be met; thousands upon thousands were imported from Ceylon and other rubber-producing countries by the Government and sold to planters and others interested in this enterprise. The result of all this is too well known to readers of The India Rubber World, and, although the expected fortunes were not realized, still the great boom has done Dutch Guiana a good turn and who knows what the future has in store for the colony. Rubber is bound to make good. All that is required is cheap production and that will eventually come.

Rubber production in British Guiana is practically at a standstill at the present time, as the foreign market hardly makes its collection a profitable undertaking. It is doubtful that the collection of rubber under existing conditions will pay. The trees are there either to be tapped unprofitably or allowed to remain untapped—preferably the latter course, until there is a greater demand for rubber and improved labor conditions make its collection a profitable concern. There is at present a greater demand in London for balata than for rubber, which brings only two shillings and three pence a pound. With the present high price of labor, it is impossible for the colony to compete against the rubber-producing countries in the East.

The presence of rubber leaf disease in the British colony is also a serious factor in the conditions operating against the production of rubber. Last year the Consolidated Rubber & Balata Estates, Limited, reported only a very small quantity of rubber from their plantations, owing to the severe attack of leaf disease from which the trees had not recovered. Considerable money was spent to eradicate the disease, but without success, and new planting was abandoned. The leaf disease is still causing a great deal of trouble and adds to the already high cost of production.

While there is little or no rubber activity at present in British Guiana, there is no reason to consider the industry altogether dead. After the great rubber boom between 1910 and 1911 the production dropped considerably in 1912, when only 216 pounds were exported, but the output rose to 1,340 pounds the following year, dropped to 1,107 pounds in 1914, and rose again in 1915 to 4,603 pounds. The export figures went as high as 15,586 pounds in 1916, dropped to 14,781 pounds the following year and reached their highest—23,854 pounds—in 1918. Although conditions were not very favorable in 1919, the total export of rubber from British Guiana was the second largest within the eight years under review, amounting to 17,793 pounds. During the first four months of this year 4,760 pounds were exported. The figures quoted do not seem to justify the view that the industry is abandoned.

It has been successfully demonstrated by experimental plantings in British Guiana that large areas are eminently suitable for the cultivation of Pará rubber. Tapping the Pará rubber trees found in the colony was begun in 1910 on two estates on the Demerara river. The quality of the rubber was good and it was valued very highly in the London market. Since then there has been a general disposition in British Guiana to plant *Hevea brasiliensis*.

The cost of rubber cultivation also had special attention and investigation by the Department of Science and Agriculture in 1911, when, on flatlands which required to be thoroughly drained and cultivated, the cost was estimated to be from $65 to $70 per acre during the first year, with an annual expenditure of from $25 to $30 per acre in subsequent years.

There are extensive rubber cultivations in British Guiana and it is regrettable that tapping operations on a large scale cannot proceed, owing to the labor conditions and the unremunerative rubber market.

In Dutch Guiana the labor question is practically settled, for large numbers of Javanese are arriving, and these are expert tappers and best adapted for rubber enterprises.

It is to be hoped, however, that both British and Dutch Guiana in the course of time will become large rubber producing countries.

BALATA NOTES FROM DUTCH GUIANA.

The year 1919 closed with a fairly satisfactory export sheet. The balata exported to the outside world and produced under the most trying circumstances has proved that the colony is still a valuable asset to the Netherlands.

The balata exported amounted to 493,907 kilos, of which 38,348 kilos was sent to Holland, 138,302 to the United States, 49,869 to France, 259,290 to England, 8,097 to other countries.

The importations from the United States reached the high figure of $4,313,101, and the total value of exports to that country

from Dutch Guiana was 2,015,505 florins or approximately $900,000.

Since the beginning of the year balata gathering has been taken rather seriously. Many large expeditions left Paramaribo for the several districts and should the weather be favorable the crop for 1920 will be a record one. There is everything at hand to make the crop of 1920 a success; the provisions from the United States are pouring into the country regularly now; the men to operate the trees are there; the money to pay them for their work is in the bank and, last but by no means the least, the trees from which the balata is gathered are in abundant evidence.

CHICLE GUM IN BRITISH GUIANA.

Announcement has been made in a report submitted by Consul McCunn of the discovery of chicle-producing trees in British Guiana. Prospecting expeditions sent into the interior have recently returned to Georgetown with fully 600 pounds of chicle, and preparations are now being made by the discoverer, who holds a concessional right over 6,200 square miles of territory, to send out four prospecting parties in order to continue investigations and ascertain the capacity of the tract. Territory thus far examined is reported to be capable of yielding 200,000 pounds of gum annually.

THE PRESENT STATUS OF LONG-STAPLE COTTON.

Some interesting information on the long-staple cotton in the United States is imparted by the Department of Commerce in Bulletin No. 140 of the Census Bureau on "Cotton Production and Distribution." The years given are generally the "growth" years for cotton, which lap over the following calendar year.

The need of long-staple cotton for the manufacture of thread, automobile tires, and high grade fabrics has caused the demand to far exceed the production. There was a time when the long-fiber Sea Island cotton grown in the West Indies formed the greater part of the cotton used in Europe; the whole world product of this variety at present, about 50,000 bales, is comparatively insignificant. The quantity of long-fiber cotton produced in Egypt last year was about 900,000 bales, and the quantity of upland and American-Egyptian cotton with a staple of 1⅛ inches or more in length produced in the United States was 1,394,000 bales. Long-staple cotton is also produced in relatively small amounts in India, Brazil, Peru, and some other countries. The amount of long-staple cotton, that is, cotton having a fiber of 1⅛ inches or more in length, produced in the world in the growth year 1918 probably did not exceed 2,500,000 bales.

SEA ISLAND COTTON.

The Sea Island cotton crop of 1918 amounted to 52,208 bales or 20,450,000 pounds gross weight, being 40,411 bales less than the previous crop and 65,351 bales less than the 1916 crop. The reduction is due to the ravages of the boll weevil and to the consequent reduction in acreage cultivated on that account. Where they stick to cotton, the farmers plant early maturing upland varieties instead of Sea Island, which takes long to ripen. The best Sea Island in the United States is grown on the islands off the coast of South Carolina; it is also grown in Georgia and in Florida.

AMERICAN-EGYPTIAN COTTON.

The imports of Egyptian cotton into the United States in the fiscal year ended July 31, 1919, amounted to 100,006 bales of 500 pounds each, compared with 114,580 bales for 1918, 199,892 bales for 1917 and 350,796 bales for 1916. The demand for Egyptian cotton led to its being grown in the United States, and its culture has been established in Arizona and California. The Department of Agriculture reports on its cultivation:

"The production of American-Egyptian has greatly increased owing to the decline in the production of Sea Island cotton, caused by the ravages of the boll weevil in the southeastern states. While not as fine as the best Sea Island fiber, American-Egyptian of the Pima variety is fully equal to most of the Sea Island crop in the length of staple and in average breaking strength. It seems to be a satisfactory substitute in making the classes of goods for which Sea Island was formerly used. The increase in the manufacture of automobile tires and the difficulties in the importation of Egyptian cotton, point to a strong demand for American-Egyptian and a corresponding increase in production."

During the calendar year 1918 about 80,000 acres of irrigated land in Arizona and California were planted with this cotton and the crop amounted to about 40,000 bales of 500 pounds which was sold at an average price of 56 cents a pound. At least 80 per cent of this was Pima, which has an average length of staple of from 1⅝ to 1¾ inches. The acreage planted in 1919 is about 90,000 acres, nearly all located in the Salt River Valley, Arizona, and almost all of it is Pima.

LONG-STAPLE UPLAND COTTON.

The long-staple upland cotton was formerly grown only in the Mississippi delta. The increased demand has caused successful attempts to be made to grow it in other parts of the cotton belt. In 1918 there were grown 1,359,000 bales of upland cotton, 1⅛ inches or more, as compared with 1,354,000 bales in 1917, 1,009,000 bales in 1916, and 832,000 bales in 1915. The increase in long-staple production is due, first, to the high prices paid for it in recent years, and second, to improved varieties, which, on the right soil, are showing themselves equal in yield and in early maturity to the short-staple cotton. It was found that 1.5 per cent of the crop was over 1¼ inches in length, the percentage in Mississippi being 5.4. The yield per acre is put at 190 pounds of lint above 1¼ inches in length, and 182 pounds from 1⅛ to 1¼ inches, compared to the 157.5 pounds of short-staple under 1⅛ inches. The long-staple varieties are grown only on better soil and by farmers who give their crops special attention. The states which produced the most long-staple upland cotton in 1918 were Mississippi, Arkansas, Texas, and South Carolina.

CANADIAN NOTES.

The Ames-Holden Rubber Boot Co., Limited, the new subsidiary of the Ames-Holden-McCready System, Montreal, Quebec, will locate its factory at Kitchener, Ontario, where it has acquired the Orphanage property at the corner of King and Wilmot streets and adjoining land, opposite the plant of the Ames-Holden Tire Co., Limited. T. H. Rieder is president of the new concern.

The B. F. Goodrich Co. of Canada, Limited, has opened a new branch at 44 Princess street, Winnipeg, Manitoba, and another at Dewdney avenue and Angus street, Regina, Saskatchewan.

K. & S. Tire & Rubber Goods, Limited, Weston, Ontario, will locate its new plant on Paton road, Toronto, Ontario. New machinery of the latest type will be used, especially in the rubber sundries department where production is especially desired to meet the increasing demand. The company also expects to build a new structure at an early date, in addition to those already acquired in Toronto.

The Dunlop Tire & Rubber Goods Co., Limited, has obtained a permit to build a $15,000 brick factory at the corner of Queen street and Booth avenue, Toronto.

At the Shoe, Leather and Allied Trades Fair, to be held in Montreal July 13-17, 1920, the following rubber companies and concerns in allied lines have secured booths: Ames-Holden-McCready, Limited, Montreal; Canadian Consolidated Rubber Co., Limited, Montreal; Columbus Rubber Co., Limited, Montreal; Goodyear Tire & Rubber Co., Limited, Montreal; Scholl Manufacturing Co., Toronto; and the United Shoe Machinery Co. of Canada, Montreal.

R. W. Ashcroft, director of publicity for the Ames-Holden-McCready System, has been elected president of the Montreal Publicity Association for the ensuing year.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED MAY 11, 1920.

No. 1,339,472. Rubber tire filler with flexible metal cable in center. M. W. Needham, Waco, Tex.
1,339,516. Pneumatic tire. Burton A. Karr, Los Angeles, Calif.
1,339,5[illegible]. Car for airships having pneumatic buffer bag inclosed within waterproof covering to provide watertight compartment around the lower side of said buffer bag. J. McKechnie, Barrow-in-Furness, assignor to Vickers, Limited, Westminster, London—both in England.
1,339,599. Rubber and fiber gasket. G. S. Garren, Oak Park, assignor to Sargent Company, Chicago—both in Ill.
1,339,602. Child's waterproof diaper. E. D. Marsh, Watervliet, N. Y.
1,339,617. Inflatable life preserver. W. M. Deneau, Chicago, Ill., assignor of one-half to H. Paschen.
1,339,738. Waterproof cover pad for mattresses. J. W. Callahan and M. B. Callahan, El Paso, Tex.
1,339,782. Pneumatic tire. I. Normandy, St. Catharines, assignor by direct and mesne assignments to I. L. Leo, Toronto—both in Ontario, Canada.
1,339,868. Pneumatic tire having reserve of expansibility. L. A. Subers, Lakewood, Ohio.
1,339,875. Fabric covered spring core for tire casings. F. L. Bailey and J. H. La Grant, Wichita, Kans.
1,339,876. Resilient core for tire casings. F. L. Bailey and J. H. La Grant, Wichita, Kans.
1,339,880. Sanitary mattress with waterproofed covering. C. S. Cooper, Hondo, Calif.
1,339,948. Inner tube having a plurality of threads engaged with the tread portion of the tire. J. M. and J. A. Dirienzo, Madison, Wis.
1,339,951. Pneumatic tire. C. C. Gates, assignor to The Gates Rubber Co.—both of Denver, Col.
1,339,994. Rubber overshoe. H. Westling, Hudson, Mass.
1,340,094. Sectional rim for tire. J. W. White, assignor of one-half to W. D. Rosebeck—of Lewistown, Mont.

ISSUED MAY 18, 1920.

1,340,199. Demountable pneumatic tire. J. S. Williams, Philadelphia, Pa. (Original application divided.)
1,340,244. Demountable rim for tires. E. J. Osborne, assignor of one-half to A. T. Bradlee—both of Brookline, Mass.
1,340,277. Fountain pen. D. J. La France and W. P. De Witt, Somerville, assignors to De Witt La France Co., Cambridge—both in Mass.
1,340,339. Pneumatic tire formed of folded and vulcanized tubes of fabric and rubber. T. H. Hill, Wilmington, Del. (Original application divided.)
1,340,341. Reinforced rubber composition sole. H. K. Hitchcock, Pittsburgh, Pa.
1,340,351. Waterproof coat. R. A. Whall, Athol, Mass.
1,340,448. Apparatus for administering anesthetics. W. A. Johnston and A. W. Browne, Prince Bay, N. Y., and F. L. Wallace, Philadelphia, Pa., assignors to the S. S. White Dental Manufacturing Co., Philadelphia, Pa. (Original application divided.)
1,340,556. Automobile tire. M. C. Overman, New York City.
1,340,608. Removable tire protector of rubberized asbestos fabric. W. A. Helm, Traverse City, Mich.
1,340,671. Demountable rim for tires. J. S. Pierce, Dunkirk, N. Y.
1,340,702. Inner tube and method of manufacture. H. Dech, assignor to Mercer Tire Co.—both of Trenton, N. J.
1,340,703. Inner tube and method of manufacture. H. Dech, assignor to Mercer Tire Co.—both of Trenton, N. J.
1,340,704. Inner tube and method of manufacture. H. Dech, assignor to Mercer Tire Co.—both of Trenton, N. J.
1,340,828. Irrigator shut-off. E. Heap, Detroit, Mich.

ISSUED MAY 25, 1920.

1,340,926. Stylographic fountain pen. C. Weitz, New York City.
1,340,973. Rubber tire vulcanizer. C. Nordstrom, Milwaukee, Wis.
1,340,977. Demountable rim for tires. H. I. Parker, San Francisco, Calif., assignor by direct and mesne assignments to Parker Collapsible Rim Corporation, Chicago, Ill.
1,340,984. Solid tire. W. H. Robinson, assignor of one-half to E. Kendall—both of Brooklyn, N. Y.
1,341,000. Demountable rim for tires. L. P. Woodbury, Berkeley, Calif., assignor to Parker Collapsible Rim Corp., Chicago, Ill.
1,341,157. Water bag for filling automobile radiators. B. T. Sublett, assignor of one-half to H. L. Sublett—both in Danville, Va.
1,341,345. Emergency tire. H. M. Shannon, assignor of one-half to O. Nentwig—both of Richmond, Tex.
1,341,380. Pneumatic tire. Y. Meyer, Birmingham, Ala., assignor of one-half to W. Amott, Salt Lake City, Utah.
1,341,383. Rubber heel. G. F. Quinn, Revere, Mass.
1,341,387. Attachable heel. G. Schrade, New York City.
1,341,407. Pneumatic shock absorber for vehicles. W. N. Amory, New York City.
1,341,451. Rubber glove. T. B. Abler, Guelph, Ontario, Canada.
1,341,529. Buoyant collapsible belt. R. M. Watts, Rock Island, Ill.

ISSUED JUNE 1, 1920.

1,341,656. Tire filler. W. H. McGowen, Vincennes, Ind.
1,341,663. Tire casing. D. C. Neal, assignor to Morgan & Wright—both of Detroit, Mich.
1,341,673. Clutch facing of sponge rubber. D. Repony, assignor to The Manhattan Rubber Manufacturing Co.—both of Passaic, N. J.
1,341,752. Life-saving device. F. Lavryk, Chicago, Ill.
1,341,782. Binder for book or pad, being flexible and elastic and containing rubber, to permit insertion or removal of some leaves without injuring binding of others. S. E. Brick, Salina, Kans.
1,341,850. Fountain pen. H. W. Haslup, Toledo, Ohio.
1,34[illegible]. Elastic band hat-pin attachment. J. B. Maserang, Belleville, Ill.
1,341,[illegible]. Split demountable rim for tires. E. Oliver, Daytona, Fla.
1,341,[illegible]. Multiple compartment inner tube for automobile and other tires. J. N. Shafer, Denver, Colo.
1,341,[illegible]. Laminated tape fabric. W. Kline, Mogadore, Ohio.
1,34[illegible]. Demountable rim for tires. W. S. Krause, North La Junta, Colo.
1,34[illegible]. Resilient tire. V. L. Buchman, Millers, Md.
1,34[illegible]. Water bag. D. A. Climes, San Diego, Calif.
1,34[illegible]. Resilient wheel with pneumatic tire around hub. H. C. Anderson, New York City.
1,34[illegible]. Protected pneumatic heel. W. E. Kay, Elyria, Ohio.
1,34[illegible]. Two chambered inner tube. R. L. Prudhomme, Natchitoches, La.

THE DOMINION OF CANADA.

ISSUED MAY 4, 1920.

19[illegible]. Pneumatic tire combined with an outer auxiliary tire. C. F. F. Allan, Sydney, Australia.
19[illegible]. Hose reel. C. J. Bradshaw, Welland, Ontario, Canada.
199,739. Hose supporter. W. W. Colson, Jacksonville, Florida, U. S. A.
199,744. Elastic tire. Amend D. Daigre, Levallois-Perret, Seine, France.
199,758. Tire valve and low air pressure signal. D. D. Getman, White Butte, South Dakota, U. S. A.
19[illegible]. Tire valve. S. C. Hawley, Los Angeles, Calif.
19[illegible]. Tire fabric. A. H. Graber, Monticello, Iowa, U. S. A.
19[illegible]. Tire valve and low air pressure. F. H. Walton, Deer Lodge, Montana, U. S. A.
199,855. Pneumatic cushion. The Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, Canada, assignee of E. S. Sylvester, New Rochelle, N. Y., U. S. A.
19[illegible]. Bloomers with elastic waistband. The Vanity Fair Silk Mills, assignee of H. J. Winsten—both of Reading, Pa., U. S. A.

ISSUED MAY 11, 1920.

199,910. Spring tire. C. Jorgensen and G. A. Dunmore, co-inventors—both of Montreal, Quebec, Canada.
199,998. Garter for knickerbockers. V. L. Munro, Chicago, Ill., U. S. A.

ISSUED MAY 18, 1920.

200,157. Surf mattress. H. B. Marshall, Long Beach, Calif., U. S. A.
200,180. Inflatable, floating equipment for soldiers, etc. C. R. Swanson, Marshall, Minn., U. S. A.
200,215. Life-preserving suit. B. C. Teeters, Ballclub, Minn., U. S. A.

ISSUED MAY 25, 1920.

200,249. Rubber band stamp. E. S. Burroughs, Liverpool, England.
200,287. Shoulder and body brace with elastic straps. W. D. Hardy, New York City, U. S. A.
800,292. Protective inner rim for pneumatic tires. B. Hirsch, Leominster, Mass., U. S. A.
200,373. Collapsible demountable rim for tires. E. W. Wulff, Toledo, Ohio, U. S. A.
200,435. Clutch facing. The Raybestos Co., assignee of S. Simpson—both of Bridgeport, Conn., U. S. A.
200,450. Resilient shoe with rubber sole and heel. G. Benzinger, assignee of a third interest of G. J. Winter and C. S. Diebolt—all of Buffalo, N. Y., U. S. A.

THE UNITED KINGDOM.

ISSUED MAY 5, 1920.

139,649. Pneumatic tire. D. Glen, Ingledene, Lawson's Road, Thornton-le-Fylde, Lancashire.
139,667. Waterproof garment with rubberized fabric applied to shoulders, chest, and arms. L. Avorio, Via Pompeo Magno, Rome.
139,733. Brush with squilgee section applied on back. A. Hall, 12 Coniston street, Belfast, Ireland.
139,743. Pneumatic tire with laminated spring core. J. A. Prince and A. L. Gilles, 16 Rue d'Angleterre, Nice, France.
139,863. Reinforced pneumatic tire. J. A. Prince and A. L. Gilles, 16 Rue d'Angleterre, Nice, France.
139,874. Boot heel with facing plate of vulcanized rubber. H. A. Kraft-Rolant, 161 Gloucester street, Ottawa, Canada.
139,905. Sole and heel protectors of rubber, etc., reinforced by metal pegs. W. Connor, 32 Lower Combe street, Croydon, Surrey.
139,914. Soft rubber rectal appliance. E. W. Cooper, 100 Holyhead Road, Coventry.
139,923. Hair slide with rubber sleeve. J. P. Wagner and J. E. Brandon, 54 Aldermanbury, London.
139,924. Rubber-covered foot-rests for motorcycles. G. Addy, Stoney Stanton Road, Coventry.
139,930. Pneumatic cord tire. E. B. Killen, 27 Queen Victoria street, London.
139,936. Artificial foot with rubber block in ankle joint. H. Yearsley, 25 Stockton street, Moss Side, Manchester.
139,953. Rims for solid tires, provided with wires to increase adhesion between tire body and foundation band. T. W. Arnall, 67 Stanmore Road, Birmingham.
140,031. Dust cap for tire valve. A. Schrader's Son, Inc., 783 Atlantic avenue, Brooklyn, N. Y., assignee of H. P. Kraft, 219 Godwin avenue, Ridgewood, N. J.—both in U. S. A.

ISSUED MAY 12, 1920.

140,118. Petrol tanks for aircraft, provided with a covering consisting of a layer of raw rubber enclosed between sheets of fabric impregnated with rubber solution, the covering being vulcanized after application. Dunlop Rubber Co., 14 Regent street, London.

Chemical Patents will be found on page 656. Machinery Patents on page 659.

140,119. The covering for petrol tanks for aircraft, described in specification No. 140,118, modified by substituting vulcanized rubber sheets for those of rubbered cloth. Dunlop Rubber Co., 14 Regent street, London.

140,120. Fuel tanks having self-sealing walls, lined with balata, gutta percha, etc. Dunlop Rubber Co., 14 Regent street, London.

140,148. Demountable rim for tires. Grimston Tyres, Limited, and J. Cooper, St. Albans, Herfordshire.

140,199. Self-filling fountain pen. W. J. Crowe, Granville Canadian Special Hospital, and J. W. Smith, 20 Victoria Park—both in Buxton, Derbyshire.

140,202. Catamenial appliance with outer casing of rubber. E. I. M. Gayfer, 19 Green street, Charing Cross Road, London.

140,214. Shaving brush, provided in center of bristles with a vacuum cup or massaging device of rubber, etc. W. M. Hoskins, Carnethy, Elmdon Road, Acocks Green, Birmingham.

140,240. Sock suspenders. Sir S. Faire and Faire Bros. & Co., Rutland street, Leicester. (Refers to specification No. 110,741.)

140,246. Hollow metal stud with vulcanite covered head, for holding a soft rubber suction disk in place on a denture. H. M. Parsons, 46 Follywell street, Blackburn.

140,248. Valve for pneumatic tire North British Rubber Co., Castle Mills, and C. Hubbard, 46 Viewforth Terrace—both in Edinburgh.

140,269. Spring wheel with rubber tread vulcanized to continuous outer rigid ring and having pneumatic tire within. A. E. Jennings, Owensboro, Kentucky, U. S. A.

140,302. Rubber soles for shoes, etc., provided with non-skid projections arranged so as not to form a defined pattern. J. J. Hartopp, Rutland street, Leicester.

140,316. Surgical douching apparatus. F. R. Arnett, 2046 North Fifth street, Philadelphia, U. S. A.

140,337. Construction of externally applied patches as protectors for shoe soles, etc. H. C. Ridout, 28 The Triangle, Bournemouth, Hampshire.

140,338. Jacket and cover for tire with rim enclosing air tube. J. Jack, Lilyvale, Copland Road, Govan, Glasgow.

ISSUED MAY 19, 1920.

140,501. Detachable rim for tires on disk wheels. Dunlop Rubber Co., 14 Regent street, Westminster, and C. Macbeth, Para Mills, Aston Cross, Birmingham. (Refers to specification No. 121,757.)

140,502. Detachable rim for tires on disk wheels. Dunlop Rubber Co., 14 Regent street, Westminster, and C. Macbeth, Para Mills, Aston Cross, Birmingham. (Refers to specification No. 121,757.)

140,564. Windshield of vehicle window cleaner. W. Faint, 7 Waterloo street, Birmingham.

140,583. Gutta percha printing blanket. G. Ruthven, Maitland Bank, Burnhead, Larkhall, Lanarkshire.

140,623. Double-ended inner tube with main and reserve air chambers having separate inflating valves. K. N. B. Lemming, 41 St. Pederstraede, and C. F. E. Baden, 25 Dronningens, Tvaergade—both in Copenhagen.

140,628. Puncture detectors for pneumatic tires, air cushions, etc. A. H. Browne, 55 Montagu Road, Hendon, London.

140,658. Rubber coated catgut for tennis rackets. S. G. Lewis, Greensburg, Pa., U. S. A.

140,659. Life-saving costume with inflatable tubes. E. C. R. Marks, 57 Lincoln's Inn Fields, London.

140,673. Neck tie, with lining of swansdown coated on one side with rubber solution. A. J. De La Lande, 33 Virginia street, Glasgow.

NEW ZEALAND.

ISSUED APRIL 8, 1920.

41,526. Sponge rubber cap for scalp treatment. G. Curtis, Palmerston North, N. Z.

42,960. Douche nozzle. Dilator Syringe Foreign Rights Corporation, 42 Broadway, New York City, assignee of J. Rose, 729 Halsey street, Brooklyn—both in New York, U. S. A.

ISSUED APRIL 22, 1920.

42,768. Auxiliary pneumatic or solid rubber tire traveling around same axis as primary pneumatic, to provide auxiliary rolling surface if primary pneumatic becomes accidentally deflated, and also to guard against crushing latter. O. Englebert, Fils & Co., 3-11 rue des Vennes, Liège, Belgium.

GERMANY.

PATENTS ISSUED, WITH DATES OF APPLICATION.

322,469. (May 28, 1919.) Resilient tire. August Sebold, Fürstenwalde,

322,837. (December 27, 1914.) Nursing nipple. Carl Cade, Berlin.

323,275. (May 9, 1919.) Resilient wheel. Friedrich Bussmann, Berlin-Pankow.

323,394. (September 25, 1918.) Resilient tire. Max Greiner, Charlottenburg

THE FRENCH REPUBLIC.

PATENTS ISSUED, WITH DATES OF APPLICATION.

502,610. (August 13, 1919.) Elastic tire. Demontible Spring Tire Co.

502,684. (December 28, 1916.) Improvements in resilient tires. A. Delille-Daigre.

502,685. (April 21, 1917.) Resilient wheel that does away with need of springs for body. J. Tavel, Vaulnavay le Haut (Isère.)

502,829. (August 19, 1919.) Improvements in pneumatic tire treads. S. Midzishums.

502,855. (August 1, 1919.) Automobile tire in sections, with constant resilience. J. Bulloz, Annecy, (Haute Savoie).

503,029. (August 25, 1919.) Auxiliary, detachable, casing for pneumatic tires. G. A. Collet.

503,138. (August 27, 1919.) Improvements in fabrics used for making balloons and dirigibles. The North British Rubber Co.

TRADE MARKS.

THE UNITED STATES.

No. 114,432. The words COUNCIL OAK above representation of an acorn in white on a black triangle surrounded on the sides by three interlinked links—rubber and rubber and fabric tires and tubes. R. B. Piper, Sioux City, Ia.

115,140. The word PROTEXALL superimposed upon a double-outlined circle bearing the words MOTOR FABRICS—waterproof automobile top and curtain material, etc. The W. J. Donnelly Co., Detroit, Mich.

116,005. The word NUFASHOND—woven and braided elastics, garters, armbands, etc. The Narrow Fabric Co., Wyomissing borough, near Reading, Pa.

117,657. Representation of a violet above the word VIOLET—elastic webs. Faire Bros. & Co., Limited, Leicester, England.

117,659. Representation of snowdrops and the words THE SNOWDROP—elastic webs. Faire Bros. & Co., Limited, Leicester, England.

118,389. Representation of airplane propeller, superimposed upon double-outlined circle—toy airplanes. Lawrence Airplane Model and Supply Co., Chicago, Ill. (See THE INDIA RUBBER WORLD, October 1, 1919, page 30.)

121,788. The words PORCUPINE BOOT on a scroll above representation of a porcupine—tire patches and inner liners. E. M. Steel, assignor to Porcupine Manufacturing Co.—both of Spokane, Wash.

123,617. The word WEDGE—rubber erasers. Joseph Dixon Crucible Co., Jersey City, N. J.

124,922. The word WALRUS—arctics. United States Rubber Co., New Brunswick, N. J., and New York City.

126,571. The words GIANT MATCH—billiard cushions. The B. F. Goodrich Co., New York City.

126,587. Ths word AUTOCRAT—rubber or rubber and fabric tires and tubes. McClaren Rubber Co., Charlottee, N. C.

127,159. A circle enclosing the words THE E. Z. MEN'S GARTER—garters. The Thos. P. Taylor Co., Bridgeport, Conn.

127,990. The letter A within outline of a spade spot—hard rubber pipe bits and cigar and cigarette holders. American Hard Rubber Co., Hempstead and New York, N. Y.

128,189. A seal bearing representation of Hermes and the words WISCO ATHLETIC SHOES—athletic shoes made of leather, rubber, and fabric in the various combinations of those materials. Wisconsin Shoe Co., Milwaukee, Wis.

128,428. The word ERCO—tank balls. Essex Rubber Co., Trenton, N. J.

128,446. The word SNOOKUMS—boots, shoes, slippers and sandals made of leather rubber, fabric and combinations of the same. J. H. Kelleher, Randolph, Mass.

128,602. The words MAN-HEIL—inhalers. Frederick Heilman Co., Johnstown, Pa. (See THE INDIA RUBBER WORLD, January 1, 1920, page 224.)

128,848. The word HEATHER—rubber heels. The Lorain Rubber Heel Co., Lorain, O.

129,168. The word KUMFIT—aprons. Brooklyn Shield and Rubber Co., Brooklyn, N. Y.

129,789. The word VICTORY—composition heels, soles and taps. The Marathon Tire & Rubber Co., Cuyahoga Falls, O.

THE UNITED KINGDOM.

393,554. The word SASHENA—rubber sheets, sanitary bandages and belts, included in Class No. 11. T. J. Smith & Nephew, Limited, 5 Neptune street, Hull.

395,156. Conventionalized representation of a roll of belting bearing the words DICK'S ORIGINAL BALATA, GUTTA PERCHA & CANVAS BELTING and the words TRADE MARK—balata, gutta percha and canvas belting. R. & J. Dick, Limited, 23 McPhail street, Greenhead, Glasgow.

395,292. The word AVORA within conventionalized sunburst as background for point of fountain pen in vertical position—fountain pens, erasers, etc. I. Levi, 9 Via Bascilica, Turin, Italy. (Care of Herbert Haddan & Co., 31-32 Bedford street, Strand, London, W. C. 2.)

395,772. The word GIANT within an oval—rag and rubber cutting machines. Taylor, Stiles & Co., Riegelsville, N. J., U. S. A. (Care of R. J. Marx, 133-139 Finsbury street, London, E. C. 2.)

395,958. Representation of a label bearing the words and letters L. P. L. PEPTOMINT GUM within a circle and diagonal polygon—chewing gum. L. P. Larson, Jr., Co., 201 East Ohio street, Chicago, Ill., U. S. A. (Care of Heron Rogers & Dehn, Bridge House, 181 Queen Victoria street, London, E. C. 4.)

396,184. Representation of a pyramid surmounted by a tire, accompanied by the words APEX RUBBER Co., TRADE MARK, all within a double-outlined circle—all goods included in Class No. 40. A. J. Milne-Smith, trading as The Apex Rubber Co., Laurel Cottage, Fox Hill, Upper Norwood, London, S. E. 19.)

400,005. The words "ODDS ON" quoted—all goods included in Class No. 40. The "Odds On" Specifics Co., Limited, 36-37 Cock Lane, Snow Hill, London, E. C. 1.

400,009. The words "ODDS ON" quoted—all goods included in Class No. 49. The "Odds On" Specifics Co., Limited, 36-37 Cock Lane, Snow Hill, London, E. C. 1.

400,645. The word POPULAR in white letters within a modified black rectangle behind a seal bearing the representation of a pair of balances and the words NORTH BRITISH RUBBER CO., LIMITED, EDINBURGH. The North British Rubber Co., Limited, Castle Mills, Fountainbridge, Edinburgh, Scotland.

400,910. The word ROVER—footballs. John Douglas, Son & Co., Trindle Works, Trindle Road, Dudley, Worcestershire.

401,109. The word WOEMI—asbestos packing, jointing, and washers, and rubber hose. E. J. Little, trading as The West of England Motor Industries, Monmouth Place, Upper Bristol Road, Bath Somerset.

401,338. The word KELVINETTE—goods manufactured from india rubber or gutta percha, not included in classes other than No. 40. Sloan-Munro & Co., Limited, 11-19 Queen street, Glasgow.

401,745. The word Goodyear divided by representation of a winged foot—goods manufactured from rubber and gutta percha, not included in classes other than No. 40. The Goodyear Tire & Rubber Co., Akron, O., U. S. A. (Care of Marks & Clark, 57-58 Lincoln's Inn Fields, London, W. C. 2.)

401,928. The word Vulzene—vulcanizing compounds. Harvey Frost & Co., Limited, 148-150 Great Portland street, London, W. 1.

401,929. The word Tredzene—vulcanizing compounds. Harvey Frost & Co., Limited, 148-150 Great Portland street, London, W. 1.

401,930. The word Redzene—vulcanizing compounds. Harvey Frost & Co., Limited, 148-150 Great Portland street, London, W. 1.

THE DOMINION OF CANADA.

26,342. The word Vac—golf balls. The Dunlop Rubber Co., Limited, Dunlop House, 1 Albany street, Regent's Park, London, N. W. 1, England.

26,447. The word Evergreen on a shield above representation of an evergreen tree—inner tubes for automobile and bicycle tires. Chipman (Canada) Limited, Montreal, Que.

26,493. The letter C surrounding the letter X and V-shaped devices—rubber boots and shoes and tiies and tubes. Converse Rubber Shoe Co., Malden, Mass., U. S. A.

26,518. The word Majestic—tires and tubes. Majestic Tire & Rubber Co., Indianapolis, Ind., U. S. A.

THE FRENCH REPUBLIC.
TO AMERICANS.

187,015. The word Goodrich—pneumatic or solid tires, belting, and all rubber articles. Société Française B. F. Goodrich, Colombes, France.

27,297. The letter G within laurel wreath, between two diamond shapes —rubber tires of all kinds and all rubber goods. The B. F. Goodrich Co., 1780 Broadway, New York City, U. S. A.

27,888. The words Adams Kis-Me—chewing gum, etc. The American Chicle Co., New Jersey, U. S. A.

27,890. The words Adams Sen Sen, with picture of ribbon—chewing gum, etc. The American Chicle Co., New Jersey, U. S. A.

27,892. The words Adams Yucatan—chewing gum, etc. The American Chicle Co., New Jersey, U. S. A.

23,893. The words Beeman's Pepsin Chewing Gum around portrait—chewing gum, etc. The American Chicle Co., New Jersey, U. S. A.

27,958. The representation of a seal bearing the words United States Rubber Company and Associated Companies on edge and the words U S Rubber System in the center—all kinds of rubber articles. United States Rubber Co., New Brunswick, N. J., U. S. A.

27,994. The letters A-W within a diamond—apparatus for repairing belting or pneumatic tires, and all utensils, accessories, and needed detached parts. The Williams Foundry & Machine Co., Akron, O., U. S. A.

28,018. The word Economy in a border—clogs of rubber, rubber composition, and fiber for boots and shoes. Emery Heel Sales Co., Boston, Mass., U. S. A.

28,026. The word Sarco in white letters on a black diamond—insulating material of all kinds, including rubber. Standard Asphalt & Refining Co., Chicago, Ill., U. S. A.

28,220. The word Mason within an oval, with a flourish—pneumatic, hollow, or solid tires, tubes, and casings. The Mason Tire & Rubber Co., Kent, O., U. S. A.

DESIGNS.
THE UNITED STATES.

No. 55,114. Rubber sole pad. Patented May 11, 1920. Term 14 years. J. E. Barney, New York City, assignor to Pioneer Products, Inc., Malone—both in New York. (See The India Rubber World, April 1, 1920, page 434.)

55,132. Tire. Patented May 11, 1920. Term 14 years. E. J. Kraft, Racine, Wis., assignor to Ajax Rubber Co., Inc., New York City.

55,135. Balloon valve. Patented May 11, 1920. Term 14 years. J. S. Maxwell, Richmond, Ind.

55,140. Tire. Patented May 11, 1920. Term 14 years. W. Seabridge, assignor to Empire Tire & Rubber Corporation—both of Trenton, N. J.

55,141. Tire. Patented May 11, 1920. Term 14 years. E. O. Sterns, Columbus, assignor to The Rotary Tire & Rubber Co., Zanesville—both in Ohio.

55,142. Tire. Patented May 11, 1920. Term 14 years. E. A. Tinsman, assignor to the Standard Tire Co.—both of Willoughby, O.

55,144. Tire. Patented May 18, 1920. Term 14 years. M. L. A. A. Allard, Akron, O., assignor to The Overland Tire & Rubber Co., Omaha, Neb.

55,146. Tire. Patented May 18, 1920. Term 7 years. A. L. Breitenstein, Akron, assignor to The Ashland Tire & Rubber Co., Ashland—both in Ohio.

55,147. Tire. Patented May 18, 1920. Term 7 years. A. L. Breitenstein, Akron, assignor to The Ashland Tire & Rubber Co., Ashland—both in Ohio.

55,158. Rubber heel. Patented May 18, 1920. Term 7 years. W. E. Durham, assignor to The Emory Rubber Sole Co., Inc.—both of Norfolk, Va.

55,171. Tire. Patented May 18, 1920. Term 14 years. J. L. Hanley, Chicago, Ill.

55,190. Tire. Patented May 18, 1920. Term 14 years. G. C. McConnell, assignor to Fidelity Tire & Rubber Co.—both of Massillon, O.

55,216. Tire. Patented May 18, 1920. Term 14 years. J. Tenney, Jr., Plainfield, N. J., assignor to Howe Rubber Corporation, a Delaware corporation.

55,236. Tire. Patented May 25, 1920. Term 7 years. G. E. Bennie, Nashville, Tenn.

55,239. Tire. Patented May 25, 1920. Term 7 years. A. L. Breitenstein, Akron, assignor to The Ashland Tire & Rubber Co., Cleveland—both in Ohio.

55,240. Tire. Patented May 25, 1920. Term 7 years. A. L. Breitenstein, Akron, assignor to The Ashland Tire & Rubber Co., Cleveland—both in Ohio.

55,287. Tire. Patented May 25, 1920. Term 14 years. E. L. Lawlor, Youngstown, O.

55,301. Tire. Patented May 25, 1920. Term 7 years. J. J. Novak, Omaha, Neb.

55,302. Tire. Patented May 25, 1920. Term 7 years. J. J. Novak, Omaha, Neb.

55,313. Tire. Patented May 25, 1920. Term 14 years. W. C. Owen, Cleveland, O.

55,314. Tire. Patented May 25, 1920. Term 14 years. W. C. Owen, Cleveland, O.

55,315. Tire. Patented May 25, 1920. Term 14 years. W. C. Owen, Cleveland, O.

55,318. Shoe sole. Patented May 25, 1920. Term 7 years. E. Phillips, Cleveland, O.

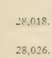
55,330. Golf ball. Patented May 25, 1920. Term 7 years. J. C. Robertson, Glasgow, Scotland.

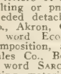
55,332. Tire. Patented May 25, 1920. Term 3½ years. G. N. Schell, Cleveland, O.

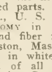
55,343. Cushion sole pad. Patented May 25, 1920. Term 3½ years. L. M. Van Wagner, and J. A. Duffy, Far Rockaway, N. Y.

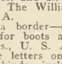
55,364. Tire. Patented June 1, 1920. Term 7 years. A. L. Breitenstein, Akron, assignor to The Ashland Tire & Rubber Co., Ashland, O.

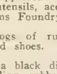
55,378. Tire. Patented June 1, 1920. Term 14 years. H. E. Grooms, Columbus, Ga.

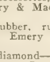

55,118

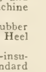

55,119

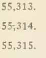

55,141

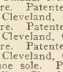

55,144

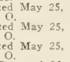

55,146

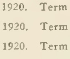

55,147

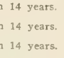

55,216

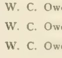

55,236

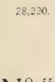

55,287

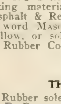

55,313

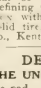

55,314

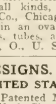

55,315

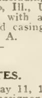

55,332

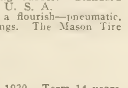

55,122

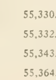

55,132

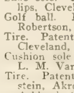

55,140

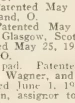

55,142

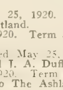

55,239

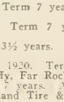

55,240

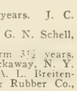

55,190


55,301


55,302


55,364


55,378


55,171

55,115. Rubber sole pad. Patented May 11, 1920. Term 14 years. J. E. Barney, New York City, assignor to Pioneer Products, Inc., Malone—both in New York. (See The India Rubber World, April 1, 1920, page 434.)

55,116. Rubber heel pad. Patented May 11, 1920. Term 14 years. J. E. Barney, New York City, assignor to Pioneer Products, Inc., Malone—both in New York. (See The India Rubber World, April 1, 1920, page 434.)

55,118. Non-skid tire. Patented May 11, 1920. Term 14 years. W. E. Dursten, New Castle, Pa. (See The India Rubber World, March 1, 1920, page 365.)

55,119. Non-skid tire. Patented May 11, 1920. Term 14 years. W. E. Duersten, New Castle, Pa.

55,122. Tire. Patented May 11, 1920. Term 7 years. J. B. Gabeline, Burlington, assignor to Standard Four Tire Co., Keokuk—both in Iowa.

55,127. Rubber heel. Patented May 11, 1920. Term 14 years. H. Hess, Baltimore, Md.

55,393. Heel. Patented June 1, 1920. Term 14 years. W. Melville, assignor to The Melville Shoe Corporation, New York City.

55,396. Cabinet for rubber bands. F. Pfous, Coshocton, O., assignor to Eberhard Faber Pencil Co., New York City.

55,397. Sole and heel pads. Patented June 1, 1920. Term 7 years. E. Phillips, Cleveland, O.

THE DOMINION OF CANADA.

4,780. Tire. Patented May 18, 1920. Dunlop Tire and Rubber Goods Company, Limited, Toronto, Ont.

4,782. Sole pad. Patented May 18, 1920. L. S. Mitchell, Montreal, Que.

4,783. Sole pad. Patented May 18, 1920. L. S. Mitchell, Montreal, Que.

4,784. Sole pad. Patented May 18, 1920. L. S. Mitchell, Montreal, Que.

Review of the Crude Rubber Market.

NEW YORK.

While there has been much speculative activity, the regular rubber market has been very dull with few sales and the lowest prices of the year. This is due in part to the general tightness of money, which makes it difficult to finance even established business. The inability to procure credits has prevented dealers from taking advantage of the low prices in the East and securing stocks in anticipation of future rises. The continued difficulties of railroad transportation have interfered with manufacturers' receiving raw materials and delivering products, which has kept rubber prices down. An additional temporary cause for this has been the large proportion of moldy rubber found in some invoices. Manufacturers are holding back mainly because their stocks are sufficient for their needs under the present hampering conditions and also in the expectation that prices will be still lower.

Forecasts in the tire-building trade have been confused somewhat by the troubles of the fabric makers with transportation and with labor, and also by the long-continued bad weather this spring, which interfered with the use of automobiles and consequently with the anticipated demand for new tires.

Prices for plantation and South American rubber at the beginning and toward the end of the month are shown in the following quotations:

PLANTATIONS. June 1, first latex crêpe, spot, 39 cents; July-September, 39½ cents; October-December, 43-43½ cents; January-June, 45 cents.

June 25, spot 38-38½ cents; July-September, 40¼ cents; October-December, 43½ cents; January-March, 45 cents; January-June, 46 cents.

June 1, ribbed smoked sheets, spot 38½ cents; July-September, 39½ cents; October-December, 43-43½ cents; January-June, 44½-45 cents.

June 25, spot, 37¼-38 cents; July-September, 39½ cents; October-December, 43 cents; January-March, 43¾ cents; January-June, 44¾ cents.

June 1, No. 1 amber crêpe, spot, 38 cents.

June 25, spot, 36½ cents; October-December, 32 cents.

June 1, No. 1 rolled brown crêpe, spot, 31 cents. June 25, spot, 30 cents; October-December, 32 cents.

SOUTH AMERICAN PARÁS AND CAUCHOS. June 1, spot prices, upriver fine, 39½ cents; islands fine, 40½ cents; upriver coarse, 30 cents; islands coarse, 22 cents; Cametá coarse, 22½-23 cents; caucho ball, 30¼ cents.

June 25, upriver fine, 37½ cents; islands fine, 40 cents; upriver coarse, 27 cents; islands coarse, 22 cents; Cametá coarse, 20½ cents; caucho ball, 28 cents.

NEW YORK QUOTATIONS.

Following are the New York spot quotations, for one year ago, one month ago, and June 25, the current date:

	July 1, 1919.	June 1, 1920.	June 25, 1920.
PLANTATION HEVEA—			
First latex crepe	$0.40 @	$0.38 @.39	$0.37¼ @.38
Amber crêpe No. 1	.38 @	.38 @.38½	.36 @.36½
Amber crêpe No. 2	.37 @	.37 @.37½	.35 @.36
Amber crêpe No. 3	.36 @	.36 @.36½	.34 @.35
Amber crêpe No. 4	.35 @	.35 @	.33 @.34
Brown crêpe, thick and thin clean	.35 @	.35 @.36	.33 @.35
Brown crêpe, thin specky	.32 @	.30 @	.31 @
Brown crepe, rolled	.29 @	.30 @.31	.30 @
Smoked sheet, ribbed, standard quality	.39 @	.38 @.38½	.37 @.37¼
Smoked sheets, plain, standard quality	.37 @	.36½ @.37½	.36 @
Unsmoked sheet, standard quality	.36 @	.35 @	.33 @
Colombo scrap No. 1	.30 @	.30 @	.30 @
Colombo scrap No. 2	.28 @	.28 @	.28 @
EAST INDIAN—			
Assam crèpe	*$0.56 @	@	@
Assam onions	@	@	@
Penang block scrap	*.38 @	@	@
PONTIANAK—			
Banjermassin	.14 @	.12 @	.12½ @
Palembang	@	.13 @	@
Pressed block	.25 @	.25 @	.24 @
Sarawak	@	@	@
SOUTH AMERICAN—			
PARÁS—			
Upriver fine	.55¼ @.56	.39½ @	.37 @.37½
Upriver medium	.51 @	.37 @	.34 @
Upriver coarse	.34 @	.30 @	.27 @
Upriver weak, fine	.46 @	.36 @	.33 @
Islands, fine	.48 @	.40½ @.41	.40 @
Islands, medium	.43 @	.38 @	.35 @
Islands, coarse	.21 @	*.22 @	.22 @
Cametá, coarse	.22½ @	*.22 @	.20 @.20½
Madeira, fine	.57 @	.43 @	.40 @
Acre Bolivian, fine	.56½ @	.41 @	.39 @
Peruvian fine	.54 @	.37 @	*.36½ @
Tapajos fine	.53 @	.38 @	*.36 @
CAUCHO—			
Lower caucho ball	.30½ @	.28 @	.27 @.28
Upper caucho ball	.48 @	.30½ @.31	.29 @
MANICOBAS—			
Ceará negro heads	*.25 @	.32 @	.25 @
Ceará scrap	*.30 @	.26 @	.18 @
Manicoba, 30% guarantee	.34 @	.30 @	.24 @
Mangabeira thin sheet	.38 @	.30 @.31	.30 @
strings	@	.34 @	.34 @
Conakry niggers	@	.33 @	.33 @
Massai sheets and strings	@	.33 @	.33 @
CENTRALS—			
Corinto scrap	.35 @.37	.25 @.25	.22 @
Esmeralda sausage	.35 @	.25 @.26	.22 @
Central scrap	.34 @	.25 @.26	.21 @.22
Central scrap and strip	.32 @	.23 @.24	.19 @.20
Central wet sheet	.28 @	.18 @.19	.15 @
Guayule, 20% guarantee	.25 @	.27 @	.27 @
Guayule, washed and dried	.36 @	.37 @	.37 @
AFRICANS—			
Niger flake, prime	@	.17 @	.16 @
Benguela, extra No. 1, 28%	*.24 @	.18 @	.21 @
Benguela, No. 2, 32½%	*.26 @	.15 @	.19 @
Congo prime, black upper	.38 @	.36 @	.19 @
Congo prime, red upper	*.34 @	.20 @	@
Kassai black	@	.36 @	.35 @
red	@	.22 @	.22 @
Rio Nunez ball	@	.35 @	.35 @
Rio Nunez sheets and			
GUTTA PERCHA—			
Gutta Siak	.25 @	.29 @	.26 @
Red Macassar	3.15 @	2.60 @	2.75 @
BALATA—			
Block, Ciudad Bolivar	.75 @	.70 @	.72 @
Colombia	@	.50 @.52	.47 @
Panama	.50 @.60	.48 @	.25 @.45
Surinam sheet	1.05 @1.10	.84 @	.79 @
amber	@	.86 @	.82 @

*Nominal.

RECLAIMED RUBBER.

Reclaimers are operating their plants on full schedules and report an active demand at no advance in prices. Transportation facilities are still in bad condition and deliveries are consequently made with difficulty. The mechanical factories of the large companies are working to capacity. In tire production output has been considerably restricted except possibly in cord tires.

NEW YORK QUOTATIONS.

JUNE 25, 1920.

Prices subject to change without notice.

Standard reclaims:

Floating	$0.30	@$0.35
Friction	.30	@ .35
Mechanical	.12½	@ .13½
Red	.23	@ .24
Shoe	.15¾	@ .16¼
Tires, auto	.16	@ .17
truck	.13	@ .14
White	.22	@ .25

COMPARATIVE HIGH AND LOW NEW YORK SPOT RUBBER PRICES.

	June.		
	1920.*	1919.	1918.
PLANTATIONS:			
First latex crêpe...	$0.39 @ $0.37½	$0.44½ @ $0.35	$0.63 @ $0.60
Smoked sheet ribbed	0.39½ @ 0.37½	0.43½ @ 0.35	0.62 @ ...
PARAS:			
Upriver, fine......	0.38½ @ 0.36¾	0.56½ @ 0.55½	0.68 @ ...
Upriver, coarse	0.28½ @ 0.26¾	0.34¾ @ 0.32½	0.40 @ ...
Islands, fine.......	0.40½ @ 0.38	0.47½ @ 0.47	0.59 @ ...
Islands, coarse	0.21 @ ...	0.22 @ .21	0.27 @ ...
Cametá	0.23 @ 0.21	0.23 @ .22	0.28 @ ...

*Figured to June 24.

THE MARKET FOR COMMERCIAL PAPER.

In regard to the financial situation, Albert B. Beers, broker in crude rubber and commercial paper, No. 1 Liberty street, New York City, advises as follows:

"During June the demand for commercial paper has been quite limited and entirely from out-of-town banks. Early in the month the best rubber names went at 8 per cent, but during the latter part of the month the rate advanced to 8¼ to 8½ per cent; names not well known are practically neglected."

SINGAPORE RUBBER MARKET.

GUTHRIE & CO., LIMITED, Singapore, report [May 6, 1920]:

Influenced by advices of a fall in values in London and New York, the rubber market showed a pronounced weakness at the auction held yesterday and to-day. Buying was on a very limited scale, and only the best of the lots offered elicited any competition. Ribbed smoked sheet sold up to 86 cents (one lot realized 86½ cents), or 6 cents below last week's best. Only a very few lots were disposed of at this figure, the average for prime sheet being about 85 cents. Fine pale crêpe sold at up to 84½ cents (three lots sold at 85, 85½ and 86 cents, respectively), showing a drop on the week of 6½ cents.

Lower grades of crêpes shared in the general decline and sellers had to make considerable concessions to meet the market. Of 699 tons offered only 366 tons were sold.

The following is the course of values:

	In Singapore per Pound.[1]	Sterling Equivalent per Pound in London.
Sheet, fine ribbed smoked......	83c @ 86c	2/ 1¾ @ 2/ 2½
Sheet, good ribbed smoked.....	72 @ 82½	1/10⅝ @ 2/ 1½
Crêpe, fine pale...............	82 @ 84½	2/ 1⅞ @ 2/ 2⅝
Crêpe, good pale..............	74½ @ 80½	1/11¾ @ 2/ 1½
Crêpe, fine brown.............	70 @ 77	1/10½ @ 2/ 0½
Crêpe, good pale..............	54 @ 68	1/ 6 @ 1/10
Crêpe, dark	50 @ 58½	1/ 4⅞ @ 1/ 7¼
Crêpe, bark	40 @ 49½	1/ 2 @ 1/ 4¾

[1]Quoted in Straits Settlements currency: $1 = $0.567 United States currency.

ANTWERP RUBBER MARKET.

GRISAR & CO., Antwerp, report [May 28, 1920]:

The low prices reached by rubber seem to have attracted the attention of buyers and we note a better demand. After having touched the price of 1*s*. 10¾*d*., the closing prices were: Latex crêpe, spot, 2*s*.; Pará fine, 2*s*. 1½*d*.

At the last moment great firmness with good tendency is noted.

Statistics for the week were as follows: Arrivals, 566 tons; sales, 1,170 tons; stock, 20,819 tons, against 21,799 in 1919.

Small quantities of African rubber were sold; 1,430 kilos of red Congo Wamba and 100 kilos of read Congo Kasai. Stock on hand: about 445 tons.

Owing to the violent fluctuations in exchange the futures market was very active, and transactions amounting to 440,000 kilos were made. Closing quotations, each month: May-November, 11.70 francs; December, 11.60 francs; January-April, 11.50. Tendency steady.

AMSTERDAM RUBBER MARKET.

JOOSTEN & JANSSEN, Amsterdam, report [June 4, 1920]:

The rubber market has again been very quiet during the past week; some spot business has been going on, but on the terminal market the turnover has been small. Prices were a little firmer: Standard crêpe, spot Amsterdam, rose from f. 1.20 to f. 1.27. On the terminal market f. 1.30 was bid for June crêpe, while June sheets were offered at f. 1.29; for standard sheets, August delivery, f. 1.29 has been paid. Toward the close the market was somewhat easier, as buyers withdrew their orders.

The next inscription sale on June 15 will comprise about 546,000 kilos., of which about 470,000 are fresh arrivals.

EXPORTS OF CRUDE RUBBER FROM BELAWAN (DELI), SUMATRA.

	March.		Three Months Ended March 31.	
	1919.	1920.	1919.	1920.
To Netherlands .....*kilos*	....	339,183	....	791,468
United Kingdom	675,112	329,541	932,856	829,984
Italy	61,120	....	61,120	....
Belgium	....	....	....	95
United States	839,464	1,080,087	1,827,724	2,979,298
Penang	26,154	106,362	69,092	215,583
Singapore	857,333	543,527	3,874,732	1,238,400
Japan	....	....	980	....
Australia	148,680	....	148,680	....
Totals .... *kilos*	2,607,863	2,398,700	6,915,184	6,054,828

PLANTATION RUBBER EXPORTS FROM JAVA.

	March.		Three Months Ended March 31.	
	1919.	1920.	1919.	1920.
To Netherlands.. ......*kilos*	......	463,000	......	1,061,000
Great Britain	173,000	157,000	1,019,000	1,167,000
France	167,000	......	176,000	......
United States...........	1,864,000	1,397,000	5,035,000	4,674,000
Singapore	459,000	430,000	1,391,000	1,170,000
Japan	59,000	102,000	125,000	131,000
Australia	51,000	......	117,000	......
Other countries.........	......	......	142,000	......
Totals	2,773,000	2,549,000	8,005,000	8,203,000
Ports of origin:				
Tandjong Priok	1,081,000	1,469,000	4,033,000	4,052,000
Samarang	133,000	17,000	156,000	150,000
Soerabaya	1,432,000	1,043,000	3,462,000	3,735,000

FEDERATED MALAY STATES RUBBER EXPORTS.

An official report from Kuala Lumpur reports that there were 8,375 tons of plantation rubber exported from the Federated Malay States in the month of April, as compared with 9,524 tons in the previous month and 7,664 tons in the corresponding month last year.

The total exports for the first four months of the present year amount to 38,799 tons as against 36,315 tons for the corresponding period in 1919 and 29,545 tons in 1918. Appended are the comparative statistics:

	1918.	1919.	1920.
January ....*tons*	7,588	7,163	11,119
February	6,820	10,809	9,781
March	7,709	10,679	9,524
April	7,428	7,664	8,375
Totals	29,545	36,315	38,799

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official report from Singapore states that there were 15,720 tons of rubber (of which 1,264 tons were transhipments) exported from the ports of the Straits Settlements in the month of April. This compares with 5,931 tons in March and 10,848 tons in the corresponding month of last year. The total exports of rubber for the first four months of the present year amounted to 52,155 tons, compared with 61,821 tons for the similar period of last year and 22,078 tons in 1918. Appended are the comparative statistics:

	1918.	1919.	1920.
January ....*tons*	4,302	14,404	13,125
February	2,334	15,661	17,379
March	8,858	20,908	5,931
April	6,584	10,848	15,720
Totals	22,078	61,821	52,155

CEYLON RUBBER IMPORTS AND EXPORTS.

IMPORTS.

	January 1 to April 26.	
Crude rubber:	1919.	1920.
From Straits Settlements.......... .....*pounds*	768,258	951,452
India	561,603	696,935
Burma and other countries.	......	6,300
Totals	1,329,861	1,654,687

EXPORTS.

	1919.	1920.
Crude rubber:		
To Great Britain...........................	11,480,555	10,699,722
Belgium	......	18,360
France	330,010	121,710
Germany	......	81,348
Netherlands ...	......	28
Italy	......	67,200
Australia	62,742	36,831
United States	25,844,821	11,324,536
Canada and Newfoundland...	260,016	425,600
India	1,677	336
Straits Settlements	424	44,800
Japan	119,501	97,100
Totals	38,099,746	22,917,571

(*Compiled by the Ceylon Chamber of Commerce.*)

ANTWERP RUBBER ARRIVALS.

April 21. By the S. S. *Albertville*, from the Congo.

Bungé et Cie. ....*kilos*	1,622
Bungé et Cie. (Comptoir Colonial Belgika.)......................	7,320
Bungé et Cie. (Compagnie du Congo Belge.)........................	10,595
Bungé et Cie. (Compagnie N'Kémé-N'Kémi.).........................	5,620
Crédit Colonial & Commercial (Anc. L. & W. van de Velde), (Cie. du Kasai.)	145,850
Société Coloniale Anversoise (S.A.B.)........................	3,792
Total ....*kilos*	174,799

(*Compiled by Grisar & Co., Antwerp.*)

CRUDE RUBBER ARRIVALS AT ATLANTIC AND PACIFIC PORTS AS STATED BY SHIPS' MANIFESTS.

PARAS AND CAUCHO AT NEW YORK.

	Fine.	Medium.	Coarse.	Caucho.	Totals. Pounds.
MAY 21. By the S. S. *Virgil*, from Pará.					
Paul Bertuch	26,984	......	10,185	38,691	75,860
Hagemeyer & Brunn	53,541	......	13,035	31,853	98,429
Poel & Kelly	3,685	......	10,051	......	13,736
MAY 27. By the S. S. *Manco*, from Manáos.					
Poel & Kelly	67,831	14,264	82,209	......	164,304
H. A. Astlett & Co.	......	......	......	......	50,568
G. Amsinck & Co., Inc.	......	......	......	......	28,028
Various	......	......	......	......	138,670
MAY 27. By the S. S. *Manco*, from Itacoatiara.					
Poel & Kelly	......	......	......	......	4,116
Various	......	......	......	......	3,822
MAY 27. By the S. S. *Manco*, from Pará.					
Poel & Kelly	......	......	......	......	9,114
Paul Bertuch	335,094	......	......	......	335,094
Wm. Schall & Co.	......	......	......	......	29,498
Hagemeyer & Brunn	115,460	......	......	......	115,460
JUNE 2. By the S. S. *Waaldyk*, from Pará.					
Various	......	......	......	7,840	7,840
JUNE 2. By the S. S. *Korean Prince*, from Pará.					
Various	......	......	......	157,091	157,091
JUNE 12. By the S. S. *Bronte*, from Pará.					
Paul Bertuch	......	......	14,560	159,031	173,591
Poel & Kelly	......	......	20,402	......	20,402
Madeira-Mamore Ry. Co	......	......	......	......	196
Hagemeyer & Brunn	112,741	......	19,344	2,668	134,753
JUNE 18. By the S. S. *Sallust*, from Pará.					
General Rubber Co.	......	......	......	......	6,664
Poel & Kelly	......	......	......	......	7,448
Various	......	......	......	......	302,232
JUNE 18. By the S. S. *Lake Gaither*, from Pará.					
Paul Bertuch	......	......	77,441	48,909	126,350
Meyer & Brown, Inc.	......	......	......	......	49,280

PLANTATIONS.

(*Figured 180 pounds to the bale or case.*)

	Shipment from:	Shipped to:	Pounds.	Totals.
MAY 20. By the S. S. *Oanfa*, at New York.				
Hood Rubber Co.	Singapore	Watertown	246,500	246,500
MAY 23. By the S. S. *Nieuw Amsterdam*, at New York.				
Meyer & Brown, Inc.	Rotterdam	New York	62,720	62,720
MAY 23. By the S. S. *Clan McPhee*, at New York.				
L. Littlejohn & Co.	Colombo	New York	89,600	
Baird Rubber & Trading Co.	Singapore	New York	22,400	
The Fisk Rubber Co.	Singapore	Chicopee Falls	11,200	
J. T. Johnstone & Co., Inc.	Singapore	New York	12,320	
Vernon Metal & Produce Co.	Cochin	New York	152,280	
Fred Stern & Co.	Colombo	New York	78,200	366,000
MAY 24. By the S. S. *Intan*, at New York.				
The Fisk Rubber Co.	Singapore	Chicopee Falls	336,000	
J. T. Johnstone & Co., Inc.	Singapore	New York	46,480	
L. Littlejohn & Co., Inc.	Singapore	New York	286,000	
Aldens' Successors, Inc.	Singapore	New York	7,300	
Poel & Kelly	Singapore	New York	114,300	
L. Sutro & Co.	Singapore	New York	14,400	
Thornett & Fehr, Inc.	Singapore	New York	17,280	
The Goodyear Tire & Rubber Co.	Singapore	Akron	217,800	
Mitsui & Co., Limited	Singapore	New York	210,780	
Fred Stern & Co.	Singapore	New York	43,740	
Bolle Watson Co., Inc.	Singapore	New York	27,180	
Various	Singapore	New York	220,320	
Fred Stern & Co.	Soerabaya	New York	58,420	
Various	Samarang	New York	11,700	
Fred Stern & Co.	Batavia	New York	60,300	
The Goodyear Tire & Rubber Co.	Batavia	Akron	113,220	
Smith & Schippers	Batavia	Akron	42,120	
L. Littlejohn & Co., Inc.	Batavia	Akron	51,660	
E. S. Kuh & Valk Co.	Batavia	Akron	20,880	
Various	Batavia	Akron	600,560	2,500,440
MAY 24. By the S. S. *Empress of Russia*, at Vancouver.				
Firestone Tire & Rubber Co.	Singapore	Akron	405,180	405,180
MAY 24. By the S. S. *New York*, at New York.				
Various	Singapore	New York	1,655,280	1,655,280
MAY 24. By the S. S. *Palacia*, at New York.				
General Rubber Co.	London	New York	1,195,740	
The Goodyear Tire & Rubber Co.	London	Akron	339,480	
Various	London	New York	447,300	1,982,520
MAY 25. By the S. S. *Defiance*, at New York.				
Various	London	New York	720	720
MAY 26. By the S. S. *Ariosto*, at New York.				
Hood Rubber Co.	Singapore	Watertown	58,750	58,750
MAY 28. By the S. S. *St. Paul*, at New York.				
Various	London	New York	70,940	70,940
MAY 28. By the S. S. *Vandyk*, at New York.				
L. Littlejohn & Co., Inc.	Soerabaya	New York	112,000	
Chas. F. Smillie & Co.	Soerabaya	New York	41,220	
Chas. F. Smillie & Co.	Batavia	New York	25,740	
Fred Stern & Co.	Batavia	New York	201,600	
Various	Asahan	New York	7,740	
The Goodyear Tire & Rubber Co.	Belawan	Akron	90,400	
Various	Belawan	New York	75,420	
G. Amsinck & Co., Inc.	Padang	New York	13,320	
Various	Soerabaya	New York	90,000	
Various	Padang	New York	15,840	
Various	Batavia	New York	148,360	821,640
MAY 30. By the S. S. *Korea Maru*, at San Francisco.				
Firestone Tire & Rubber Co.	Penang	Akron	266,400	266,400
MAY 30. By the S. S. *Rotterdam*, at New York.				
Fred Stern & Co.	Rotterdam	New York	55,624	
L. Littlejohn & Co.	Amsterdam	New York	56,000	111,624
MAY 31. By the S. S. *Ninian*, at New York.				
Fred Stern & Co.	Liverpool	New York	3,780	3,780
JUNE 1. By the S. S. *Maryland*, at New York.				
T. D. Downing & Co.	London	New York	123,840	123,840
JUNE 2. By the S. S. *Waaldyk*, at New York.				
The Goodyear Tire & Rubber Co.	Soerabaya	Akron	126,180	
Various	Soerabaya	New York	236,700	
Manhattan Rubber Mfg. Co.	Batavia	New York	27,000	
The Goodyear Tire & Rubber Co.	Batavia	Akron	30,960	
Robertson, Cole & Co.	Batavia	New York	53,280	
L. Littlejohn & Co.	Java	New York	128,000	
United Malaysian Rubber Co., Ltd.	Borneo	New York	16,410	
Charles T. Wilson Co., Inc.	Rotterdam	New York	33,200	651,730
JUNE 3. By the S. S. *Port Darwin*, at New York.				
Poel & Kelly	London	New York	110,340	
T. D. Downing & Co.	London	New York	70,380	
Charles T. Wilson Co., Inc.	London	New York	55,558	
Various	London	New York	1,141,802	1,378,080
JUNE 2. By the S. S. *Vennonia*, at New York.				
Various	London	New York	38,700	38,700
JUNE 3. By the S. S. *Port Curtis*, at New York.				
Chas. T. Wilson Co., Inc.	London	New York	6,720	6,720
JUNE 6. By the S. S. *Colusa*, at San Francisco.				
The Goodyear Tire & Rubber Co.	Singapore	Akron	197,280	
Fred Stern & Co.	Singapore	New York	78,200	
Firestone Tire & Rubber Co.	Penang	Akron	499,860	
Gates Rubber Co.	Penang	Denver	136,260	911,600
JUNE 6. By the S. S. *Kaiserin Auguste Victoria*, at New York.				
Thornett & Fehr, Inc.	Liverpool	New York	5,940	5,940
JUNE 7. By the S. S. *Ixion*, at Seattle.				
Firestone Tire & Rubber Co.	Singapore	Akron	255,960	
The Goodyear Tire & Rubber Co.	Singapore	Akron	180	
L. Littlejohn & Co., Inc.	Singapore	New York	99,360	
Meyer & Brown, Inc.	Singapore	Vancouver	67,200	422,700
JUNE 9. By the S. S. *West Hartland*, at Seattle.				
The Goodyear Tire & Rubber Co.	Singapore	Akron	97,380	
J. E. Lancaster	Singapore	Seattle	353,340	450,720
JUNE 9. By the S. S. *Totori Maru*, at New York.				
G. Kawahara Co.	Singapore	New York	18,000	18,000
JUNE 9. By the S. S. *Arabia Maru*, at Seattle.				
Charles T. Wilson Co., Inc.	Singapore	New York	56,000	56,000
JUNE 10. By the S. S. *Santa Malta*, at New York.				
J. Aron & Co.	Colombo	New York	11,960	
W. R. Grace & Co.	Colombo	New York	7,200	
Baring Bros.	Colombo	New York	13,860	
Hood Rubber Co.	Colombo	Watertown	35,640	
Wilson, Holgate & Co., Ltd.	Colombo	New York	5,220	
Charles T. Wilson Co., Inc.	Colombo	New York	16,258	
Fred Stern & Co.	Colombo	New York	4,480	
Meyer & Brown, Inc.	Colombo	New York	12,320	
L. Littlejohn & Co.	Colombo	New York	67,200	
Various	Colombo	New York	73,378	247,516
JUNE 11. By the S. S. *Borderer*, at New York.				
Fred Stern & Co.	Colombo	New York	44,800	
Meyer & Brown, Inc.	Colombo	New York	11,200	
L. Littlejohn & Co.	Singapore	New York	560,000	
Charles T. Wilson Co., Inc.	Colombo	New York	8,960	
Various	Singapore	New York	1,779,300	2,404,260
JUNE 14. By the S. S. *Verbania*, at New York.				
The Goodyear Tire & Rubber Co.	Liverpool	Akron	157,680	157,680
JUNE 14. By the S. S. *City of Benares*, at New York.				
Wm. Brandt & Sons	Colombo	New York	38,520	
L. Littlejohn & Co., Inc.	Colombo	New York	89,600	
E. S. Kuh & Valk Co.	Colombo	New York	64,720	
Baring Bros.	Colombo	New York	113,400	
Alfred Kramer & Co.	Colombo	New York	29,600	
Fred Stern & Co.	Colombo	New York	11,200	
Meyer & Brown, Inc.	Colombo	New York	112,000	
Various	Colombo	New York	43,660	502,700
JUNE 14. By the S. S. *Port Bowen*, at New York.				
The B. F. Goodrich Co.	London	Akron	242,280	
General Rubber Co.	London	New York	238,500	
Poel & Kelly	London	New York	147,600	
Various	London	New York	1,080	629,460

PLANTATIONS.

	Shipment from:	Shipped to:	Pounds.	Totals.
JUNE 14. By the S. S. *Nitonian*, at Boston.				
Hood Rubber Co........	London	Watertown	119,105	119,105
JUNE 17. By the S. S. *Andijk*, at New York.				
Meyer & Brown, Inc...	Rotterdam	New York	145,600	145,600
JUNE 18. By the S. S. *West Coyote*, at New York.				
Various	London	New York	29,700	29,700
JUNE 18. By the S. S. *City of Corinth*, at New York.				
The Goodyear Tire & Rubber Co...........	Colombo	Akron	86,400	
L. Littlejohn & Co....	Colombo	New York	67,200	
Various	Rangoon	New York	20,160	173,760
JUNE 21. By the S. S. *New York*, at New York.				
Baring Bros............	London	New York	421,020	421,020
JUNE 21. By the S. S. *Suveric*, at New York.				
Mitsui & Co. Limited..	Singapore	New York	67,200	
The B. F. Goodrich Co..	Singapore	Akron	19,305	
Thornett & Fehr, Inc..	Singapore	New York	44,800	
The Goodyear Tire & Rubber Co............	Singapore	Akron	446,850	
Raw Products Co......	Singapore	New York	84,000	
Fred Stern & Co.......	Singapore	New York	336,000	
Meyer & Brown, Inc...	Singapore	New York	246,400	
Various	Sinapore	New York	818,679	2,063,234
JUNE 21. By the S. S. *Rottig*, at New York.				
Aldens' Successors, Inc.	T'jong Priok	New York	52,200	
Fred Stern & Co........	T'jong Priok	New York	44,460	
Various	T'jong Priok	New York	96,660	
The B. F. Goodrich Rubber Co..............	Batavia	Akron	186,480	
Meyer & Brown, Inc...	Batavia	New York	22,400	
Charles T. Wilson Co., Inc.	Soerabaya	New York	128,240	
United Malaysian Rubber Co.	Soerabaya	New York	3,038	
Various	Batavia	New York	348,162	881,640

CENTRALS.

	Shipment from:	Shipped to:	Pounds.	Totals.
MAY 24. By the S. S. *Zulia*, at New York.				
Oriental Drug Co......	Venezuela	New York	1,950	1,950
MAY 24. By the S. S. *Lake Flattery*, at New York.				
Wm. Schall & Co......	Cristobal	New York	3,750	
Various	Cristobal	New York	3,750	7,500
MAY 31. By the S. S. *Lake Gilboa*, at New York.				
Ultramares Corp........	Colombia	New York	1,200	1,200
MAY 31. By the S. S. *Fredness*, at New York.				
Various	Trinidad	New York	1,650	1,650
JUNE 1. By the S. S. *Mexico*, from Vera Cruz.				
J. A. Medina Co......	Vera Cruz	New York	2,700	
Rafael del Castillo & Co.	Cartegena	New York	600	3,300
JUNE 9. By the S. S. *Colon*, at New York.				
Mecke & Co............	Cristobal	New York	1,495	
Pablo Calvet & Co.....	Cristobal	New York	4,140	
Various	Cristobal	New York	1,380	7,015
JUNE 9. By the S. S. *Helikon*, at New York.				
Ultramares Corp........	Cristobal	New York	4,945	4,945
JUNE 17. By the S. S. *Tivives*, at New York.				
Ultramares Corp........	Cristobal	New York	5,250	5,250

AFRICANS.

	Shipment from:	Shipped to:	Pounds.	Totals.
MAY 24. By the S. S. *Westerdyk*, at New York.				
Poel & Kelly...........	Rotterdam	New York	130,820	
Various	Rotterdam	New York	104,995	135,815
MAY 24. By the S. S. *Nieuw Amsterdam*, at New York.				
Various	Rotterdam	New York	476,100	476,100
MAY 26. By the S. S. *Jacques Cartier*, at New York.				
Huth & Co.............	Havre	New York	40,940	40,940
MAY 27. By the S. S. *Sarcoxie*, at New York.				
Poel & Kelly...........	Bordeaux	New York	25,969	
Various	Bordeaux	New York	48,338	74,307
MAY 27. By the S. S. *West Wauneke*, at New York.				
Various	Antwerp	New York	32,645	32,645
MAY 31. By the S. S. *Rotterdam*, at New York.				
Various	Rotterdam	New York	214,360	214,360
JUNE 1. By the S. S. *Ninian*, at New York.				
Fred Stern & Co.......	Liverpool	New York	3,378	3,378
JUNE 3. By the S. S. *Pt. Darwin*, at New York.				
Poel & Kelly...........	Liverpool	New York	17,390	17,390
JUNE 6. By the S. S. *Lapland*, at New York.				
Various	Antwerp	New York	16,100	16,100
JUNE 6. By the S. S. *West Point*, at New York.				
Chas. Pfizer & Co......	Lisbon	New York	361,215	361,215

	Shipment from:	Shipped to:	Pounds.	Totals.
JUNE 6. By the S. S. *Tongrier*, at New York.				
Various	Rouen	New York	13,915	13,915
JUNE 8. By the S. S. *Ablanset*, at New York.				
Various	Lisbon	New York	943,670	943,670
JUNE 9. By the S. S. *Oxonian*, at New York.				
Fred Stern & Co.......	Liverpool	Boston	34,051	34,051
JUNE 16. By the S. S. *Leopoldina*, at New York.				
Joosten & Janssen.....	Havre	New York	230	230
JUNE 18. By the S. S. *Andijk*, at New York.				
Various	Rotterdam	New York	287,890	287,890
JUNE 21. By the S. S. *Providence*, at New York.				
Wm. Schall & Co......	Marseilles	New York	290,835	290,835
JUNE 21. By the S. S. *Caroline*, at New York.				
Poel & Kelly...........	Bordeaux	New York	125,235	
Various	Bordeaux	New York	35,765	161,000
JUNE 21. By the S. S. *San Geneiro*, at New York.				
T. D. Downing & Co....	Genoa	New York	25,875	25,875
JUNE 22. By the S. S. *Noordam*, at New York.				
Various	Rotterdam	New York	161,575	161,575

PONTIANAK.

	Shipment from:	Shipped to:	Pounds.	Totals.
MAY 28. By the S. S. *Veendyk*, at New York.				
Various	Soerabaya	New York	216,000	216,000
JUNE 2. By the S. S. *Waaldyk*, at New York.				
E. Everett Carleton & Co.	Soerabaya	New York	78,300	
Various	Soerabaya	New York	295,800	374,100
JUNE 6. By the S. S *Maaldyk*, at New York.				
The United Malaysian Rubber Co., Limited..	Borneo	New York	100,471	100,471
JUNE 21. By the S. S. *Rotti*, at New York.				
United Malaysian Rubber Co., ...	Soerabaya	New York	139,800	
L. Littlejohn & Co., Inc.	Soerabaya	New York	132,000	271,800
JUNE 21. By the S. S. *Suveric*, at New York.				
Various	Singapore	New York	50,460	50,460

BALATA.

	Shipment from:	Shipped to:	Pounds.	Totals.
MAY 31. By the S. S. *Lake Sunapee*, at New York.				
Antoine Chiris Co......	San Juan	New York	6,450	6,450
MAY 31. By the S. S. *Matura*, at New York.				
Middleton & Co........	Trinidad	New York	18,495	
Edward Maurer Co., Inc.	Trinidad	New York	7,800	26,295
JUNE 10. By the S. S. *Carrillo*, at New York.				
American Trading Co...	Santa Marta	New York	1,666	1,666
JUNE 21. By the S. S. *Oranje Nassau*, at New York.				
Wm. Schall & Co......	Paramaribo	New York	2,550	
Middleton & Co., Ltd..	Paramaribo	New York	1,500	4,050
MAY 24. By the S. S. *Valacia*, at New York.				
Earle Bros.	London	New York	2,550	2,550
MAY 29. By the S. S. *Lake Sunapee*, at New York.				
Middleton & Co., Limited	Surinam	New York	6,213	6,213
MAY 31. By the S. S. *Lake Gilboa*, at New York.				
Ultramares Corp.......	Colombia	New York	7,050	
W. Reed Williams, Inc..	Colombia	New York	2,700	9,750

GUAYULE.

	Shipment from:	Shipped to:	Pounds.	Totals.
MAY 26. By rail at Eagle Pass, Texas.				
Continental-Mexican Rubber Co...............	Mexico	Akron	134,775	134,775
JUNE 14. By rail at Laredo, Texas.				
Continental-Mexican Rubber Co.	Mexico	New York	60,000	60,000
JUNE 16. By rail at Laredo, Texas.				
Continental-Mexican Rubber Co.	Mexico	New York	58,000	58,000

GUTTA PERCHA.

	Shipment from:	Shipped to:	Pounds.	Totals.
JUNE 2. By the S. S. *Waaldyk*, at New York.				
The United Malaysian Rubber Co., Limited..	Borneo	New York	6,052	6,052
JUNE 21. By the S. S. *Suveric*, at New York.				
Various	Singapore	New York	3,300	3,300

GUTTAS.

	Shipment from:	Shipped to:	Pounds.	Totals.
JUNE 2. By the S. S. *Waaldyk*, at New York.				
Rubber Co., Limited..				
The United Malaysian	Borneo	New York	35,796	35,796

UNITED STATES CRUDE RUBBER IMPORTS FOR 1920 (BY MONTHS).

1920.	Plantations.	Parás.	Africans.	Centrals.	Guayule.	Maniçoba and Matto Grosso.	Balata.	Miscellaneous Gum.	Waste.	Totals. 1920.	Totals. 1919.
January ....tons	17,799	2,620	821	111	.....	.....	.....	.....	.....	21,351	7,235
February	29,681	2,456	558	265	34	.....	.....	.....	.....	32,994	17,456
March	28,533	2,463	514	23	114	3	113	983	1,252	33,998	28,223
April	21,036	1,893	628	29	79	10	22	812	448	24,957	28,146
May	24,443	2,025	662	95	113	....	45	1,059	224	28,666	97,410
Totals	121,492	11,457	3,183	523	340	13	180	2,854	1,924	141,966	178,470

(Compiled by The Rubber Association of America, Inc.)

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES, DURING THE MONTH OF APRIL, 1920.

EXPORTED TO—	Belting.	Hose.	Packing.	Boots.		Shoes.		Soles and Heels.	Automobile Tires.				Insulated Wire and Cables.	Druggists' Rubber Sundries.	All Other Manufactures of Rubber.	Totals.
	Value.	Value.	Value.	Pairs.	Value.	Pairs.	Value.	Value.	Casings. Value.	Inner Tubes. Value.	Solid Tires. Value.	All Others. Value.	Value.	Value.	Value.	Value.
EUROPE:																
Azores and Madeira Islands								$130								$130
Belgium	$916		$1,372			96	$55	2,305	$58,539	$6,910	$628		$814	$11,213	$17,770	100,522
Bulgaria									61	13						74
Denmark		$2,277	241	296	$1,191	9,797	13,789	1,240	125,528	5,251				9,751	7,997	167,265
Finland						31,300	36,383		21,000	2,400	2,155				390	62,328
France	11,773	1,201				5,112	3,370		113,986	13,929	492		3,164	4,531	53,757	206,203
Germany				1	6				29,837	10,356			277		12	40,488
Gibraltar									161	30						191
Greece						5	5	1,531	84,634	4,653		$880		1,113	100	92,916
Iceland and Faroe Islands				105	375				760				14		1,644	2,793
Italy			824			3,353	3,421		62,995	5,953			112	7,184	5,880	86,369
Netherlands			289	12	45	2,136	1,884	291	49,140	2,560	428		2,321	2,383	22,937	82,278
Norway	1,475	10,324	127	2,890	4,488	141,675	123,509	11,016	86,139	11,308	30,681		950	75,707	23,126	378,850
Poland and Danzig										50				1,106		1,156
Portugal			6						37,629	3,040					38	40,713
Rumania									8,334	656	3,974					12,964
Russia in Europe															159	159
Spain	837	30	14			8,724	5,686	2,899	90,163	27,623	10,543	60	4,367	4,238	4,395	150,864
Sweden	8,007	2,178	85	444	1,350				191,778	23,113	125	4,861	2,074	6,686	10,907	251,164
Switzerland						11,944	11,441		124,349	6,405			1,034	256	7,941	151,426
Turkey in Europe			4			2,032	2,774		5,478	377				920	233	9,786
England	3,040	32,451	2,272	4,092	8,140	290,297	235,366	3,408	230,282	21,566	14,846	4,029	12,860	54,804	194,270	817,334
Scotland								100	6,375	80					3,170	9,725
Ireland								413	123							536
Yugoslavia, Albania, etc									2,000							2,000
TOTALS, EUROPE	$26,048	$48,470	$5,234	7,840	$15,595	506,471	$437,683	$23,333	$1,329,291	$146,273	$63,872	$9,830	$27,987	$179,892	$354,726	$2,668,234
NORTH AMERICA:																
Bermuda		$477	$458	4	$22	1,123	$1,179	$407				$39	$12	$592	$935	$4,121
British Honduras	$70	46				1,193	1,770		$690	$25			67		281	2,949
Canada	24,171	18,100	9,608	4,347	15,942	30,621	33,783	2,056	183,472	16,555	$50,827	2,634	23,767	16,606	220,615	618,136
Costa Rica	896	151	36			12	13	507	1,196	220		31	272	165	672	4,159
Guatemala	1,986		307					1,361	5,417	2,913			129	2,909	3,212	18,234
Honduras	635	636	900	1	3	86	111	230	925	210	75	13	174	196	1,172	5,280
Nicaragua	1,050	634	56			480	496	1,959	3,353	369	19		581	67	665	9,249
Panama	787	3,541	700	120	310	8,600	7,424	3,409	33,846	1,410	1,191	416	666	11,303	3,057	68,060
Salvador	441	954	344					3,112	12,930	600			216	1,437	795	20,829
Mexico	35,183	28,867	12,637	26	122	22,931	21,757	8,214	71,677	8,961	10,913	4,550	7,085	25,397	19,060	254,423
Miquelon, Langley, etc									20						22	42
Newfoundland and Labrador	2,187	100		12,444	36,617	2,018	2,503	1,108	653	93		125	94	1,733	2,149	47,362
Barbados	174					269	249	31	3,607	277	160			380	802	5,680
Jamaica	270	583	15	102	158	1,368	1,659	185	8,033	479	358	156	9	483	1,229	13,617
Trinidad and Tobago		94	109			10,619	7,864	789	14,836	1,623	1,804	160	929	1,297	122	29,627
Other British West Indies	98	135	35			1,307	1,575		900	85		56	29	73	234	3,220
Cuba	3,010	19,255	30,433			41,226	41,840	11,763	165,965	29,424	21,587	5,238	21,545	42,825	25,210	418,095
Virgin Islands of the U. S.		953	183			723	1,050	500	1,012	29		1,011			112	4,850
Dutch West Indies		17				2	2		1,422	280		60	43	23	69	1,916
French West Indies	242			30	30				1,522		183	85		45	89	2,196
Haiti	51	34				124	149	30	4,141	408			258		1,403	6,474
Dominican Republic	200	248	15			1,713	2,617	835	15,816	3,057	1,404	1,526	1,166	181	6,150	33,215
TOTALS, NORTH AMERICA	$71,451	$74,825	$55,836	17,074	$53,204	124,415	$126,041	$36,496	$531,433	$67,018	$88,521	$16,100	$57,042	$105,712	$288,055	$1,531,734
OCEANIA:																
Australia	$4,346	$695	$4,391			252	$287	$140	$113,459	$6,342	$4,563	$154	$1,674	$5,800	$6,124	$147,975
New Zealand	222	1,035	2,867	732	$3,919	3,176	2,321		84,402	10,929	53,623	2,561	3,492	1,225	6,736	173,332
Other British Oceania						160	144		2,101							2,245
French Oceania		50	159			651	773		1,935	48	596	81		37	249	3,928
Other Oceania						202	160		55						135	350
Philippine Islands	8,657	772	3,821	48	87	6,360	4,944	17,175	143,414	14,845	16,223	8,500	13,312	410	23,181	255,341
TOTALS, OCEANIA	$13,225	$2,552	$11,238	780	$4,006	10,801	$8,629	$17,315	$345,366	$32,164	$75,005	$11,296	$18,478	$7,472	$36,425	$583,171
SOUTH AMERICA:																
Argentina	$26,026	$24,051	$9,275	240	$940	350	$360	$11,231	$211,037	$21,821	$4,600	$7,398	$62,491	$5,198	$30,454	$414,882
Bolivia		491							5,412	1,856					117	7,876
Brazil	3,673	7,903	4,966			36,430	34,680	13,840	96,677	17,796	10,210	1,571	117,513	3,734	15,106	327,669
Chile	3,914	7,933	5,175	262	1,872	3,526	3,320	128	20,970	1,715	3,646		9,351	367	7,772	66,163
Colombia	378	490	775	1	4	1,208	1,160	2,617	7,141	1,137	1,781	46	2,860	2,077	2,842	23,308
Ecuador		78	9			48	60		2,826				388	690	232	4,283
British Guiana		10				3,523	3,909		2,160	339			369	20	208	7,015
Dutch Guiana									486					151	308	945
French Guiana									201							201
Paraguay		64											450		450	964
Peru		698	2,103			16	69		14,858	2,296	2,229	140	7,246	895	1,918	32,452
Uruguay		862	214			1,594	1,274	469	31,565	2,902	3,208	1,536	1,821	1,207	5,780	50,838
Venezuela	34	1,339	190			475	436		24,090	3,720	627	100	2,271	3,717	6,456	42,980
TOTALS, SOUTH AMERICA	$34,025	$43,919	$22,707	503	$2,816	47,170	$45,268	$28,285	$417,423	$53,582	$26,301	$10,791	$204,760	$18,056	$71,643	$979,576

EXPORTED TO—	Belting. Value.	Hose. Value.	Packing. Value	Boots. Pairs.	Boots. Value.	Shoes. Pairs.	Shoes. Value.	Soles and Heels. Value.	Automobile Tires. Casings. Value	Automobile Tires. Inner Tubes. Value.	Automobile Tires. Solid Tires. Value	Automobile Tires. All Others Value	Insulated Wire and Cables. Value.	Druggists' Rubber Sundries. Value	All Other Manufactures of Rubber Value	Totals Value
EUROPE:																
ASIA:																
Aden									$982	$248						$1,230
China	$9,047	$5,090	$1,430			1,022	$1,709		31,131	2,637	$4,438		$3,131	$2,014	$5,349	65,476
Kwantung, leased territory				1	$4	1	2		3,462							3,468
Chosen		37				257	234		4,770	1,985		$15		18		7,0[illegible]9
British India		429		91	136	1,700	1,711	$22	54,429	8,928	18,728		364	1,074	2,262	88,083
Straits Settlements		10				60	30		153,565	8,722	13,818	849	3,071	20	580	180,615
Other British East Indies	1,323								9,894	3,662		387			121	15,482
Dutch East Indies		261	650						55,503	4,100	35,797	4,000	8,118		5[illegible]1	88,9[illegible]0
French East Indies									234						12	246
Hongkong				168	336	1,418	1,808		2,345			958	35	94	93	5,669
Japan	33,488	13,177	1,296	1,802	4,566	39,730	52,795		50,748	8,436	2,022	962	803	1,879	[illegible]6,709	196,3[illegible]1
Persia						3,200	3,262		650	200						4,112
Russia in Asia																[illegible]
Siam						456	421		1,757	90				16	7[illegible]9	3,213
Turkey in Asia								411	2,510	728		1[illegible]0			37	4,0[illegible]6
TOTALS, ASIA	$43,858	$18,944	$3,376	2,062	$5,042	47,839	$60,972	$433	$351,980	$39,736	$74,803	$7,[illegible]86	$15,47[illegible]	$5,315	$36,785	$664,00[illegible]
AFRICA:																
Belgian Kongo		$2,591														$2,591
British West Africa									$58,688	$11,623				$316		70,627
British South Africa	$26,914	11,041	$12,736	148	$573	5,092	$4,824	$1,428	84,819	12,762		$347	$1,8[illegible]8	811	$8,906	166,983
British East Africa	3,978	30							4,652	320			66			9,046
Canary Islands									200	50					194	444
French Africa									14,188	4,560					225	18,973
Morocco									140	25						165
Portuguese Africa		84													105	189
Egypt		3,117							10,665	2,407		2,384	348		243	19,164
TOTALS, AFRICA	$30,892	$16,863	$12,736	148	$573	5,092	$4,824	$1,428	$173,352	$31,747		$2,731	$2,242	$1,127	$9,667	$288,182
GRAND TOTALS	$219,499	$205,573	$111,127	28,407	$81,236	741,788	$683,417	$107,290	$3,148,845	$370,520	$328,502	$58,034	$526,556	$116,999	$797,301	$6,7[illegible]4,[illegible]99

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORY OF THE UNITED STATES.

	Belting, Hose and Packing. Values	Boots and Shoes. Pairs.	Boots and Shoes. Value.	Tires. Automobile. Value	Tires. All Others. Value.	Insulated Wire and Cables Value.	Druggists' Rubber Sundries. Value.	All Other Manufactures of Rubber Value	Totals Value
Hawaii	$23,324			$91,783	$3,269			$18,192	$136,568
Porto Rico	27,571			58,390	1,161			16,301	103,423
TOTALS	$50,895			$150,173	$4,430			$34,493	$239,991

(Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.)

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

April.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
UNMANUFACTURED—free:				
India rubber				
From France			864,073	$251,239
Netherlands			133,674	54,892
Portugal	2,000	$720	14,100	9,869
United Kingdom	5,635,298	2,732,804	8,800,914	4,233,181
Canada	647,043	286,906	41,880	15,009
Central America	24,669	9,746	16,462	3,855
Mexico	40,274	11,925	7,139	2,185
Brazil	3,296,587	960,330	5,183,214	1,499,276
Peru	199,859	81,068	789,052	246,707
Other South Am.	345,014	131,698	113,005	27,874
British E. Indies	40,637,290	15,820,145	39,262,162	19,215,266
Dutch E. Indies	10,178,932	3,819,947	8,097,239	3,785,268
Other countries	758,264	285,821	306,355	108,772
Totals	61,765,830	$24,141,110	63,629,269	$29,453,393
Balata	132,321	$63,493	79,073	$47,037
Guayule	521,243	108,943	105,658	22,676
Jelutong (Pontianak)	1,411,499	118,156	1,720,819	298,528
Gutta percha	610,206	101,408	804,191	170,350
Rubber scrap	848,052	67,724	1,852,484	108,772
Totals, unmanufactured	65,289,151	$24,600,834	68,191,494	$30,100,756
Chicle (dutiable)	743,951	497,984	431,718	312,998
MANUFACTURED—dutiable:				
India rubber and gutta percha		113,552		73,972
India rubber substitutes	283	44	8,946	1,539

EXPORTS OF DOMESTIC MERCHANDISE.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
MANUFACTURED—				
India rubber:				
Scrap and old	588,488	$78,796	699,424	$41,888
Reclaimed	311,361	52,379	289,964	50,796
Belting[1]				219,499
Hose[1]		533,769		205,573
Packing[1]				111,127
Boots[1]	17,078	52,569	28,407	81,236
Shoes[1]	294,236	224,247	741,788	683,417
Soles and heels[1]				107,290
Tires:				
For automobiles[1]				
Casings[1]				3,148,845
Inner tubes[1]		3,923,924		370,520
Solid tires[1]				328,502
All other tires[1]		137,754		58,034
Druggists' rubber sundries[1]		116,524		116,999
Suspenders and garters		181,380		301,538
Other rubber manufactures[1]		941,292		797,301
Totals manufactured		$6,242,634		$6,622,565
Fountain pens ...number	33,905	$43,525	57,081	$87,326
Insulated wire and cables[1]		789,991		526,556

EXPORTS OF FOREIGN MERCHANDISE.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
UNMANUFACTURED				
India rubber	433,206	$199,409	845,016	$238,954
Balata	64,960	37,874	98,419	49,485
Gutta percha			14,560	6,860
Jelutong (Pontianak)	2,427	606		
Totals, unmanufactured		$237,889		$295,299
MANUFACTURED—				
Gutta percha		$621		$1,670
Totals, manufactured		$621		$1,670
Chicle			43,915	$44,352

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
MANUFACTURED—				
To Alaska:				
Belting, hose and packing		$23,579		$25,532
Boots and shoes ...pairs	11,477	31,630	11,385	43,133
Other rubber goods		3,880		6,316
Totals		$59,089		$74,981
To Hawaii:				
Belting, hose and packing		$4,952		$23,324
Automobile tires		91,927		91,783
Other tires		1,558		3,269
Other rubber goods		13,352		18,192
Totals		$111,789		$136,568
To Porto Rico:				
Belting, hose and packing		$6,187		$27,571
Automobile tires		74,871		58,390
Other tires		3,412		1,161
Other rubber goods		6,043		16,301
Totals		$90,513		$103,423

To Philippine Islands—treated as foreign commerce.

[1] Details of exports of domestic merchandise by countries during April are given on pages 698-699 of this issue.

UNITED KINGDOM RUBBER STATISTICS.

IMPORTS.

	April.			
	1919		1920.	
UNMANUFACTURED— Crude rubber: From—	Pounds.	Value.	Pounds.	Value.
Straits Settlements	9,555,400	£1,062,840	5,218,700	£636,494
Federated Malay States	11,205,200	1,188,080	6,966,600	848,448
British India	1,633,300	175,604	800,100	96,420
Ceylon and dependencies	4,025,400	437,376	3,431,500	415,713
Other Dutch possessions in Indian Seas	1,505,100	166,213	661,700	80,981
Dutch East Indies (except other Dutch possessions in Indian Seas)	1,788,400	197,323	1,753,100	210,055
Other countries in East Indies and Pacific not elsewhere specified	243,600	25,888	173,500	20,982
Brazil	3,706,500	400,880	1,386,300	149,940
Peru	12,000	840	900	90
South and Central America (except Brazil and Peru)	23,700	2,225	5,700	672
West Africa:				
French West Africa	......	....	4,700	255
Gold Coast	43,400	4,790	17,100	1,937
Other parts of West Africa	69,900	8,390	357,100	25,074
East Africa (including Madagascar)	218,000	20,735	293,700	33,527
Other countries	60,200	7,167	146,500	11,701
Totals	34,090,100	£3,658,351	21,247,200	£2,532,289
Waste and reclaimed rubber	380,600	11,295	996,700	19,717
Totals, unmanufactured	34,470,700	£3,669,646	22,243,900	£2,552,006
Gutta percha and balata	607,700	83,172	502,500	84,106
Rubber substitutes	......	......	246,000	10,417
MANUFACTURED—				
Boots and shoes..*dozen pairs*	28,773	£40,647	26,698	£68,689
Waterproofed clothing	......	1,062	......	270
Tires and tubes	......	270,071	.....	501,394
Other rubber manufactures	......	41,742	.....	58,600
Insulated wire	......	......	.....	5,180
Totals	......	£353,522	......	£634,133

EXPORTS.

	1919 Pounds.	1919 Value.	1920 Pounds.	1920 Value.
UNMANUFACTURED—				
Waste and reclaimed rubber	420,600	£12,132	1,576,900	£41,959
*Rubber substitutes	......	......	257,000	12,686
Totals	......	£12,132	......	£54,645
MANUFACTURED—				
Boots and shoes..*dozen pairs*	9,651	£17,499	6,719	£14,833
Waterproofed clothing	......	84,816	......	267,648
Insulated wire	......	37,716	.....	121,048
Submarine cables	......	87,084	......	88,278
Tires and tubes	......	266,297	......	552,196
Other rubber manufactures	......	204,533	......	369,818
Totals	......	£697,945	......	£1,413,821

EXPORTS—COLONIAL AND FOREIGN.

	1919 Pounds.	1919 Value.	1920 Pounds.	1920 Value.
UNMANUFACTURED— Crude rubber:				
To Sweden, Norway and Denmark	528,300	£73,252	199,900	£22,468
Germany	......	......	1,193,700	142,204
Belgium	1,161,300	81,709	998,100	121,854
France	2,387,700	267,769	3,142,300	421,811
Spain	45,300	5,286	99,500	13,281
Italy	753,000	86,225	1,323,000	174,074
Other European countries	......	......	57,700	5,940
United States	2,057,700	193,263	7,676,300	938,762
Canada	48,500	5,425	714,300	85,107
Other countries	160,400	20,710	203,100	26,419
Totals, rubber	7,142,200	£733,639	15,607,900	£1,951,920
Waste and reclaimed	......	......	8,300	373
Gutta percha and balata	163,500	6,419	216,200	34,275
*Rubber substitutes	......	......	7,300	490
MANUFACTURED—				
Boots and shoes..*dozen pairs*	13	£73	3	£26
Waterproofed clothing	......	397	......	......
Tires and tubes	......	14,548	......	32,411
Insulated wire	......	1,243	......	85
Other manufactures	......	4,683	......	1,914
Totals, manufactured	......	£20,944	......	£34,436

*Included in "Other Articles," Class III, T., prior to 1920.

RUBBER STATISTICS FOR THE DOMINION OF CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	March.			
	1919.		1920.	
UNMANUFACTURED—*free*	Pounds.	Value.	Pounds.	Value.
Rubber, gutta percha, etc.:				
From United Kingdom	86,368	$29,012	905,319	$581,613
United States	414,988	182,047	516,817	192,995
Brazil	......	....	36,036	26,327
British East Indies:				
Ceylon	333,079	146,697	291,200	192,391
Straits Settlements	734,656	274,928	1,652,309	840,583
Dutch East Indies	......	......	114	57
Other countries	......	......	4,486	2,086
Totals	1,569,091	$632,684	3,406,281	$1,836,052
Rubber, recovered	314,801	$50,538	586,432	$88,549
Rubber scrap	233,922	25,941	101,502	11,420
Rubber substitutes	166,057	19,921	271,962	32,584
Totals unmanufactured	2,283,871	$729,084	4,366,177	$1,968,605
PARTLY MANUFACTURED—				
Hard rubber sheets and rods	4,048	$3,185	18,827	$14,688
Hard rubber tubes	......	4,619	......	2,835
Rubber thread, not covered	5,347	3,511	6,227	8,998
Totals, partly manufactured	9,395	$11,315	25,054	$26,521
MANUFACTURED—				
Belting	......	$10,955	......	$15,836
Hose	......	11,697	......	9,941
Packing	......	7,391	.....	17,133
Boots and shoes	......	24,850	....	21,500
Clothing, including waterproofed	.....	20,065	...	29,962
Gloves	......	.....	......	1,195
Hot water bottles	......	†	......	3,799
Mats and matting	......	766	......	460
Tires, solid	......	166,345	......	14,764
Tires, pneumatic	......		......	380,913
Tires, inner tubes	......		......	47,720
Tires, other kinds	......		......	......
Other manufactures	......	191,320	......	367,711
Totals, manufactured	......	$413,324	......	$910,934
Totals, rubber imports	......	$1,153,723	......	$2,906,060
Insulated wire and cables:				
Wire and cables covered with cotton, linen, silk, rubber, etc.	......	$36,285	......	$11,301
Copper wire and cables, covered as above	......	*	......	24,871
Chicle	279,666	229,372	167,846	121,322

†Included in "Other Manufactures." *Included in "Wire and cables."

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	March.			
	1919.		1920.	
UNMANUFACTURED—	Produce of Canada. Value	Reexports of Foreign Goods. Value.	Produce of Canada. Value.	Reexports of Foreign Goods. Value.
Crude and waste rubber	$8,739	......	$37,072	......
MANUFACTURED—				
Belting	$9,391	......	$1,347	......
Hose	37,165	......	16,778	......
Boots and shoes	626,454	$533	146,814	$76
Clothing, including waterproofed	944	......	5,132	......
Tires, pneumatic	......	......	974,026	......
Tires, other kinds	606,944	2,097	......	3,677
Other manufactures	......	1,311,129	10,799	1,528
Totals, manufactured	$1,280,898	$1,313,759	$1,144,896	$5,281
Totals, rubber exports	$1,289,637	$1,313,759	$1,181,968	$5,281

EXPORTS OF INDIA RUBBER FROM MANAOS DURING APRIL, 1920.

	EUROPE.					NEW YORK.					
EXPORTERS.	Fine.	Medium.	Coarse.	Caucho.	TOTALS.	Fine.	Medium.	Coarse.	Caucho.	TOTALS.	GRAND TOTALS.
Tancredo, Porto & C......*kilos*	207,360	13,947	19,087	16,801	257,195	53,349	48,873	14,051	274,459	390,732	647,927
General Rubber Co. of Brazil	171,591	14,478	14,491	13,236	213,790	25,282	924	27,052	802	54,060	267,850
Ohliger & Co.	104,631		....		104,631	27,756	10,380	4,327	39,115	81,578	186,209
Stowell & Co.	66,692	5,507	14,138	27,464	113,801		6,796	25,842	480	33,112	146,913
B. Levy & Co.	28,686	3,958	51,939	....	84,583	..	.....	.....	....		84,583
Adelbert H. Alden, Limited	15,640	.	..	...	15,640	..	4,409	9,305	554	14,268	29,908
Semper & Co.	13,600	1,600	3,330	....	18,530	..	.....	......	...	..	18,530
Moraes, Carneiro & Co.	4,519	480	398	559	5,956	5,600	320	150	.....	6,070	12,026
	612,719	39,970	103,383	58,054	814,126	111,987	71,696	80,727	315,410	579,820	1,393,946
In transit, Iquitos	7,599	190	1,120	......	8,909	8,672	25,347	7,326	10,913	52,258	61,167
Totals......*kilos*	620,318	40,160	104,503	58,054	823,035	120,659	97,043	88,053	326,323	632,078	1,455,113

(*Compiled by Stowell & Co., Manáos, Brazil.*)

CUSTOM HOUSE STATISTICS.

PORT OF NEW YORK.

IMPORTS.

	April. 1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
UNMANUFACTURED—*free*:				
Crude rubber:				
From Belgium	....	....	116,819	$58,175
France	....	....	864,073	251,239
Netherlands	....	....	133,674	54,892
Portugal	2,600	$720	14,100	9,689
England	5,635,298	2,732,804	8,712,078	4,186,309
Canada	262,380	115,132	....	....
Costa Rica	2,021	762	445	153
Guatemala	2,200	1,091	....	....
Honduras	156	109	....	....
Nicaragua	12,324	4,282	6,218	1,713
Panama	389	95	7,264	1,573
Salvador	5,858	2,958	....	....
Mexico	8,420	2,332	7,139	2,185
Trinidad	5,383	2,603	1,135	478
Brazil	3,296,587	960,330	5,183,214	1,499,276
Colombia	217,184	88,556	38,837	10,445
Ecuador	51,300	12,826	56,009	12,776
Peru	199,859	81,068	789,052	246,707
Uruguay	17,900	8,950	18,159	4,653
Venezuela	58,710	21,366	....	....
British India	67,365	29,621	435,912	215,660
Straits Settlements	1,086,118	408,429	32,605,537	15,971,292
British E. Indies	14,396,486	5,824,032	4,140,785	1,908,405
Dutch E. Indies	7,926,608	3,002,396	7,647,262	3,623,383
Japan	....	....	67,300	33,409
Philippines	120,881	45,216	13,096	5,896
British W. Africa	61,934	13,871	92,572	41,109
British S. Africa	....	....	13,871	5,548
Portuguese Africa	....	....	962	230
Totals	33,437,955	$13,359,549	60,965,513	$28,145,195
Jelutong (Pontianak):				
From France	....	....	43,310	$7,464
Straits Settlements	344,861	$28,772	1,677,509	291,064
Dutch E. Indies	739,952	66,453	....	....
Totals	1,084,813	$95,225	1,720,819	$298,528
Gutta percha:				
From England	1,745	$312	769	$832
Straits Settlements	176,204	20,302	683,691	150,030
Dutch E. Indies	374,933	69,179	150	30
British W. Africa	....	....	7,624	1,905
Totals	552,882	$89,793	692,234	$152,797
Balata:				
From England	....	....	11,396	$9,555
Panama	59,042	$25,396	2,420	868
Trinidad	187	112	....	....
Colombia	17,426	8,098	18,083	7,184
Ecuador	9,900	3,960	....	....
British Guiana	....	....	17,854	10,505
Dutch Guiana	2,241	1,837	19,180	14,417
Venezuela	37,025	20,723	10,140	4,508
Totals	125,821	$60,126	79,073	$47,037
Reclaimed and scrap rubber	331,420	$29,687	1,308,534	$84,348
Totals, unmanufactured	35,532,891	$13,634,380	64,766,173	$28,707,905
Chicle ...*dutiable*	211,545	$99,224	368,192	$272,889
Rubber substitutes	283	44	8,946	1,539
Manufactures of rubber and gutta percha...*dutiable*	....	48,263	....	42,000

EXPORTS.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
MANUFACTURED:				
Automobile tires	....		....	$2,259,097
Inner tubes	....	$3,128,295	....	273,426
Solid tires	....		....	211,926
All other tires	....	116,852	....	37,698
Belting	....		....	101,384
Hose	....	277,127	....	125,872
Packing	....		....	66,598
Rubber boots ...*pairs*	6,938	20,540	7,823	20,001
Rubber shoes ...*pairs*	228,020	165,131	370,259	353,657
Soles and heels	....	....	....	78,531
Druggists' sundries	....	63,389	....	72,088
Other manufactures of rubber	....	573,254	....	460,651
Totals, manufactured	....	$4,344,588	....	$4,060,929
Insulated wire	....	$641,054	....	$437,331
Fountain pens....*number*	30,137	39,009	54,618	84,607
Suspenders and garters	....	147,183	....	257,228
Chewing gum	....	102,984	....	167,899
UNMANUFACTURED:				
Reclaimed and scrap rubber	436,422	65,703	111,254	14,524

FOREIGN EXPORTS.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
UNMANUFACTURED:				
India rubber	31,450	$19,100	710,130	$180,859
Gutta percha	....	....	14,560	6,860
Balata	64,960	37,874	98,417	49,484
Rubber manufactures	....	605	....	1,526

PORT OF BOSTON.

IMPORTS.

	April. 1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
UNMANUFACTURED—*free*:				
Crude rubber:				
From England	....	....	88,836	$46,872
Straits Settlements	323,703	$89,281	....	....
Gutta percha	....	....	111,957	17,353
Rubber scrap	1,900	135	104,234	5,681
Rubber manufactures, *dutiable*	....	4,665	....	18,011

EXPORTS.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
MANUFACTURED:				
Automobile tires	....	$21	....	$4,435
Inner tubes	....	....	....	2,301
Solid tires	....	....	....	24
All other tires	....	....	....	125
Belting	....	37	....	5,067
Hose	....	1,685	....	8,315
Rubber boots	1,740	5,522	13,124	33,605
Rubber shoes	8,385	6,930	297,107	250,282
Soles and heels	....	....	....	2,976
Druggists' sundries	....	2,031	....	10,361
All other manufactures of rubber	....	42,330	....	57,154
Totals	10,125	$58,556	310,331	$384,645
Insulated wire	....	$144	....	$30,737
Suspenders and garters	....	2,881	....	12,487
Rubber scrap	57,725	7,725	50,812	4,573

PORT OF NEW ORLEANS.

IMPORTS.

	April. 1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
UNMANUFACTURED—*free*:				
Crude rubber:				
From Nicaragua	1,727	$449	2,535	$416
Mexico	31,854	9,593	....	....
Totals	33,581	$10,042	2,535	$416
Chicle	11,064	7,771	997	659

EXPORTS.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
MANUFACTURED:				
Automobile tires	....		....	$37,403
Inner tubes	....	$5,071	....	11,084
Solid tires	....		....	445
All other tires	....	658	....	891
Belting	....		....	12,787
Hose	....	3,357	....	9,964
Packing	....		....	15,003
Rubber boots	7	25	2	7
Rubber shoes	4,546	4,530	13,563	15,258
Soles and heels	....	....	....	6,486
Druggists' sundries	....	640	....	23
Other rubber manufactures	....	2,016	....	2,151
Totals	4,616	$16,297	13,565	$111,502
Insulated wire	....	$3,653	....	....
Fountain pens	12	20	....	....
Suspenders	....	995	....	2,230
Chewing gum	....	4,468	....	3,832
UNMANUFACTURED:				
Reclaimed rubber	270	180	....	....

PORT OF SEATTLE.

IMPORTS.

	April. 1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
UNMANUFACTURED—*free*:				
Crude rubber:				
From Canada	....	....	4,811	$1,664
China	127,050	$63,525	....	....
Straits Settlements	10,567,209	4,269,697	665,640	366,695
British East Indies	446,410	169,738	11,200	3,085
Dutch East Indies	....	....	4,336	2,046
Japan	162,578	76,475	....	....
Totals	11,303,247	$4,579,435	685,987	$373,490
Jelutong	158,218	$15,806	....	....
Rubber scrap	10,172	383	34,000	$2,040
Rubber manufactures	....	9	....	....

EXPORTS.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
MANUFACTURED:				
Automobile tires	....		....	$14,290
Inner tubes	....	$5,007	....	2,229
Solid tires	....		....	5,281
All other tires	....	793	....	4
Belting	....		....	1,065
Hose	....	16,283	....	200
Packing	....		....	403
Rubber boots	789	3,588	84	354
Rubber shoes	1,022	628	208	260
Druggists' sundries	....	1,768	....	1,938
Other rubber manufactures	....	10,732	....	1,674
Totals	1,811	$38,799	292	$27,698
Insulated wire	....	$146	....	$9
Fountain pens	54	131	144	12
Suspenders	....	978	....	1,343
UNMANUFACTURED:				
Reclaimed rubber	....	....	90,695	3,967

PORT OF SAN FRANCISCO.

IMPORTS.

	April			
	1919.		1920.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED—*free*:				
Crude rubber.				
From Straits Settlements..	9,652,116	$3,399,427	1,002,681	$522,138
British East Indies.	78,425	32,305	....	....
Dutch East Indies.	2,252,324	817,551	341,442	110,033
Hong Kong	280,438	84,131	600	200
Totals	12,263,303	$4,333,414	1,344,723	$632,371
Jelutong	168,468	$7,125	....	....
Gutta percha	57,324	11,615	....	....
Chicle	62,609	69,036	....	....
Rubber manufactures	....	22	....	$19

EXPORTS.

MANUFACTURED:				
Automobile tires	....	$380,419	....	$348,614
Inner tubes	....	....	....	32,554
Solid tires	....	....	....	23,520
All other tires............	....	13,052	....	9,141
Belting	....	64,508	....	45,602
Hose	....	....	....	9,771
Packing	....	....	....	11,999
Rubber boots	157	507	1,086	4,913
Rubber shoes	11,710	11,207	5,584	6,066
Druggists' sundries	....	28,089	....	4,164
Other rubber manufactures.	....	63,815	....	21,048
Totals	11,867	$561,597	6,670	$517,492
Insulated wire	....	$82,527	....	$5,664
Fountain pens	154	204	339	582
Suspenders	....	11,293	....	1,537
Chewing gum	....	5,521	....	1,923
UNMANUFACTURED—*free*:				
Reclaimed and scrap rubber.	18,340	$1,125	238,112	$12,192

REEXPORTS.

Crude rubber	....	....	298	$63
Chicle	....	....	43,367	44,196
Rubber manufactures	....	$1	....	....

THE MARKET FOR RUBBER SCRAP.

NEW YORK.

THE SITUATION in the rubber scrap market is described as easier. Tires and shoes are lower than last month. The market changes but slightly from week to week. The activity is not up to normal and the outlook is problematical. Prices quoted are nominal.

QUOTATIONS FOR CARLOAD LOTS DELIVERED.

JUNE 25, 1920.

Prices subject to change without notice.

BOOTS AND SHOES:				
Arctic tops	*lb.*	$0.01	@	
Boots and shoes	*lb.*	.07	@	.07¼
Trimmed arctics	*lb.*	.05¾	@	.06
Untrimmed arctics	*lb.*	.04¾	@	.05
HARD RUBBER:				
Battery jars, black compound	*lb.*	.01	@	.01¼
No. 1, bright fracture	*lb.*	.23	@	.24
INNER TUBES:				
No. 1	*lb.*	.15½	@	.16
Compounded	*lb.*	.09½	@	.09¾
Red	*lb.*	.08	@	.08½
MECHANICALS:				
Black scrap, mixed, No. 1	*lb.*	.03½	@	.04
No. 2	*lb.*	.02½	@	.02¾
Car springs	*lb.*	.03½	@	.04
Heels	*lb.*	.03	@	.03½
Horse-shoe pads	*lb.*	.03	@	.03½
Hose, air brake	*lb.*	.03½	@	.03¾
fire, cotton lined	*lb.*	.01½	@	.01¾
garden	*lb.*	.01½	@	.01¾
Insulated wire stripping, free from fiber	*lb.*	.03½	@	.04
Matting	*lb.*	.01¼	@	.01½
Red packing	*lb.*	.05½	@	.06
Red scrap, No. 1	*lb.*	.09	@	.10
No. 2	*lb.*	.06¾	@	.07¼
White scrap No. 2	*lb.*	.08	@	.09
No. 1	*lb.*	.10	@	.11
TIRES:				
PNEUMATIC—				
Auto peelings	*lb.*	.04¼	@	.04½
Bicycle	*lb.*	.02¾	@	.03
Standard white auto	*lb.*	.04¼	@	.04⅜
Standard auto	*lb.*	.03	@	.03¼
Stripped, unguaranteed	*lb.*	.02¼	@	.02½
White, G. & G., M. & W., and U. S.	*lb.*	.04¾	@	.05
SOLID—				
Carriage	*lb.*	.04	@	.04¼
Irony	*lb.*	.01	@	
Truck	*lb.*	.03½	@	.03¾

THE MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

AMERICAN COTTON. The market has been quiet and steady with little business done. Middling uplands stayed at 40 cents till the middle of the month, then declined slightly and gradually until it reached 38.25 cents at the time of going to press. Tight money and the raising of the rate of interest by the Federal Reserve Board, have contributed to this result. Reports on the new crop are conflicting as so much depends on the weather, owing to the lateness in planting on account of the hard winter. In some districts planters have turned to farm produce instead of cotton, because of the boll weevil and the high prices of vegetables; in others they are planting more cotton than before. It is too early to speculate on the amount of the new crop. Meanwhile conditions in England point to a diminution, if not a complete cessation, of imports of cotton from the United States.

SEA ISLAND COTTON. There is no change in the situation regarding Sea Island Cotton, and no signs of a cessation of the ravages of insect pests. Many planters have given up cotton for the time being or have cut down their acreage, as Sea Island cotton seems to have abdicated in favor of Arizona.

EGYPTIAN COTTON. Reports here are also conflicting. While information has been given out that a larger acreage than ever has been planted with cotton, owing to the high prices and the speculation of last season, equally positive is the assertion that the Government has insisted that a large proportion of the cotton land, two-thirds, should be planted with food stuffs.

ARIZONA COTTON. Every available foot of ground has been utilized and a record crop is anticipated, perhaps three times the 42,734 bales of last year. All of the crop has been contracted for by fabric manufacturers.

COTTON FABRICS. The difficulties in meeting the demands for tire fabrics have been relieved, partly by the congestion of transportation, which, by holding up steel, rubber and other raw materials, has forcibly reduced the manufacture of automobiles and of tires, and partly by desire to substitute cord tires for those made of square woven fabrics and the consequent cessation of the call for the latter. There is a great confusion about contracts, on this account and reluctance to give out quotations or terms of settlement.

The market for hose and belting fabrics is strong but the offerings are restricted. There is a rush to cancel contracts in drills, sheetings and osnaburgs, and the sales of piece goods at the mills have fallen sharply; the manufacturers, however, see no prospect of reducing prices.

NEW YORK QUOTATIONS.

JUNE 25, 1920.

Prices subject to change without notice.

ASBESTOS CLOTH:				
Brake lining, 2½ lbs. sq. yd., brass or copper insertion	*lb.*	$1.00	@	1.10
2¼ lbs. sq. yd., brass or copper insertion	*lb.*	1.10	@	1.15
BURLAPS:				
32—7-ounce	100 *yards*		@	
32—8-ounce			@	
40—7½-ounce		8.25	@	
40—8-ounce		8.50	@	
40—10-ounce		11.00	@	
40—10½-ounce		11.50	@	
45—7½-ounce			@	
45—8-ounce			@	
48—10-ounce			@	
DRILLS:				
38-inch 2.00-yard	*yard*	.47½	@	
40-inch 2.47-yard		.39¼	@	
52-inch 1.90-yard		.60½	@	
52-inch 1.95-yard		.59¼	@	
60-inch 1.52-yard		.86	@	

DUCK:

CARRIAGE CLOTH:

38-inch 2.00-yard enameling duck	yard	$.45		
38-inch 1.74-yard		.56¼	@	
72-inch 16.66-ounce		1.30	@	
72-inch 17.21-ounce		1.49	@	

MECHANICAL:

Hose	pound	.82	@	
Belting		.8[illegible]	@	

HOLLANDS, 40-INCH:

Acme	yard		@	
Endurance			@	
Penn			@	

OSNABURGS:

40-inch 2.35-yard	yard		@	
40-inch 2.48-yard			@	
37½-inch 2.42-yard			@	

RAINCOAT FABRICS:

COTTON:

Bombazine 64 x 60	yard	.30	@	
60 x 48		.27	@	
Cashmeres, cotton and wool, 36-inch, tan		1.00	@	
Twills 64 x 72		.46	@	
64 x 102		.48	@	
Twill, mercerized, 36-inch, blue and black		.60	@	
tan and olive		.57½	@	
Tweed		.80	@	1.40
printed		.27½	@	
Plaids 60 x 48		.28	@	
56 x 44		.27	@	
Repp		.40	@	.45
Prints 60 x 48		.29	@	
64 x 60		.32	@	

IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING—PLAIN AND FANCIES:

63-inch, 3¼ to 7½ ounces	yard	1.45	@	3.90
36-inch, 2¾ to 5 ounces		.85	@	2.25

IMPORTED PLAID LINING (UNION AND COTTON):

63-inch, 2 to 4 ounces	yard	.95	@	1.90
36-inch, 2 to 4 ounces		.60	@	1.15

DOMESTIC WORSTED FABRICS:

36-inch, 4½ to 8 ounces	yard	$0.85	@	1.90

DOMESTIC WOVEN AND PLAID LININGS (COTTON):

36-inch, 3¾ to 5 ounces		.27	@	.35

SHEETINGS, 40-INCH:

48 x 48, 2.35-yard	yard	.32	@	
48 x 48, 2.50-yard		.30	@	
48 x 48, 2.70-yard			@	
48 x 48, 2.85-yard		.28	@	
64 x 68, 3.15-yard		.31	@	
56 x 60, 3.60-yard		.28	@	
48 x 44, 3.75-yard		.25½	@	

SILKS:

Canton, 38-inch	yard	.67½	@	
Schappe, 36-inch		.90	@	

STOCKINETTES:

SINGLE THREAD:

3½ Peeler, carded	pound		@	
4½ Peeler, carded		1.15	@	1.15¼
6½ Peeler, combed		1.80	@	

DOUBLE THREAD:

Zero Peeler, carded	pound	.98	@	.98½
3½ Peeler, carded		1.04	@	1.04½
6½ Peeler, combed		2.70¼	@	2.70½

TIRE FABRICS:

BUILDING:

17¼-ounce Sakellarides, combed	pound	2.50	@	3.00
17¼-ounce Egyptian, combed		2.30	@	2.55
17¼-ounce Egyptian, carded		2.20	@	2.45
17¼-ounce Peelers, combed		2.20	@	2.50
17¼-ounce Peelers, carded		1.40	@	1.55

CORD:

15-ounce Egyptian	pound	2.75	@	2.80

BICYCLE:

8-ounce American	pound	1.80	@	2.00
10-ounce American		1.70	@	1.80

CHAFER:

9¼-ounce Sea Island	pound	2.70	@	
9¼ ounce Egyptian, carded		2.50	@	2.69
9¼-ounce Peeler, carded		1.79	@	2.00

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

NEW YORK.

THE generally congested freight conditions still continue to hamper the distribution of stocks in all lines. Producers are endeavoring to keep their regular customers supplied, but are not seeking new business which would be only adding to their present difficulties. Prices generally have remained firm and unchanged with tendency to advance.

ANILINE OIL. The demand has been steady. Prices firm. Spot early in the month was 34 cents per pound.

BARYTES. Shipping facilities for miners of barytes showed slight improvement a few weeks ago, much to their encouragement. Attention is concentrated on back orders and quotations on future business are not being made.

BENZOL. Production continues far behind deliveries. Spot stocks are around 28 cents a gallon for the 90 per cent grade.

BLACKS. Business in blacks is maintained at an active and steady demand. Manufacturers of carbon black are harassed by legislation which has caused removal of plants to sections of the country far from the field of consumers, and, by the utilization of poorer qualities of natural gas. The demand from rubber manufacturers grows steadily and has reached very large proportions. The outlook certainly does not indicate any lowering in price in the near future.

Carbon Bisulphide. The demand is good with spot prices varying from 7½ to 8 cents.

Carbon Tetrachloride. This material is in good demand and the price holds rather firm and steady.

Dry Colors. Throughout the past month trade and prices have continued strong.

Litharge. Demand on all lead and zinc products far exceed the supply which in the Eastern section of the United States has been practically depleted, owing to inability of the railroads to move shipments from the Western producers.

Lithopone. Many manufacturers are actively engaged in preparing for an increase of production due to the excessive demand. The producers are endeavoring to supply old customers but with indifferent success, owing to the railroad situation. The price remains nominally unchanged at 8 cents.

Sublimed Lead. The same conditions of overdemand and short supply prevail in all lead products. Sublimed lead is under the same influences that affect litharge.

Sulphur. The market situation of sulphur remained practically unchanged during the month, both as to price and steady demand.

Whiting. Chalk has been arriving in slightly increased amount but the whiting supply is exceedingly short and prices firm.

Zinc Oxide. Producers of zinc oxide and lithopone are in a similar position as to output. They are planning to increase production and are not looking for new business. New domestic companies for the manufacture of zinc oxide are reported to be forming and very little zinc oxide of foreign make is coming in. As regards quality the foreign-made goods are fully matched by the domestic.

NEW YORK QUOTATIONS.

June 25, 1920.

Prices subject to change without notice.

ACCELERATORS, ORGANIC.		
Accelerene, New York	lb.	$4.75 @
Accelemal	lb.	.55 @ .57½
Aldehyde ammonia crystals	lb.	2.25 @ 2.50
Aniline oil	lb.	.35 @
Excellerex	lb.	.65 @ .75
Hexamethylene tetramine (powdered)	lb.	2.50 @ 3.50
N. C. C.	lb.	.50 @
No. 999	lb.	.21 @
Paraphenylenediamine	lb.	2.70 @ 2.85
Thiocarbanilide	lb.	.55 @ .70
Velosan	lb.	3.70 @ 3.85
Vul-Ko-Cene	lb.	.35 @
ACCELERATORS, INORGANIC.		
Lead, dry red (bbls.)	lb.	.12¼ @
sublimed blue (bbls.)	lb.	.10 @
sublimed white (bbls.)	lb.	.10 @
white, basic carbonate (bbls.)	lb.	.10½ @
Lime, flour	lb.	.02 @ .02½
Litharge, domestic	lb.	.11¾ @ .13¾
sublimed	lb.	.12 @ .
imported	lb.	
Magnesium, carbonate, light technical	lb.	.11½ @ .14
calcined extra light	lb.	.60 @
calcined light	lb.	.35 @
calcined medium light	lb.	.30 @
calcined heavy	lb.	.07½ @ .08
calcined commercial (magnesite)	lb.	.04 @ 0.05
oxide, extra light	lb.	.65 @ .67
oxide, imported	lb.	.55 @
ACIDS.		
Acetic, 28 per cent (bbls.)	cwt.	3.75 @ 4.50
glacial, 99 per cent (carboys)	cwt.	15.95 @ 16.70
Cresylic (97% straw color) (drums)	gal.	1.20 @ 1.30
(95% dark) (drums)	gal.	1.10 @ 1.20
Muriatic, 20 degrees	cwt.	3.25 @ 2.50
Nitric, 36 degrees	cwt.	[illegible]
Sulphuric, 66 degrees	ton	[illegible]
ALKALIES.		
Caustic soda, 76 per cent (bbls.)	lb.	.06¼ @ .07½
Soda ash (bbls.)	lb.	[illegible]

COLORS.		
Black:		
Bone, powdered	lb.	$0.06 @
granulated	lb.	.11 @
Carbon black (sacks, factory)	lb.	.15 @ .30
Drop	lb.	.05½ @ .15
Ivory black	lb.	.16 @ .30
Lampblack	lb.	.15 @ .45
Oil soluble aniline	lb.	1.00 @
Rubber black	lb.	.09½ @
Blue:		
Cobalt	lb.	.25 @ .35
Prussian	lb.	1.00 @
Ultramarine	lb.	.18 @ .50
Rubber makers' blue	lb.	3.50 @
Brown:		
Iron oxide	lb.	.04¾ @ .06¾
Sienna, Italian, raw and burnt	lb.	.06 @ .14
Umber, Turkey, raw and burnt	lb.	.05½ @ .09
Vandyke	lb.	.02½ @ .10
Green:		
Chrome, light	lb.	.42 @ .70
medium	lb.	.42 @ .70
dark	lb.	.50 @ .70
commercial	lb.	.07 @ .15
Oxide I. R.	lb.	.70 @
Oxide of chromium (casks)	lb.	1.25 @
Rubber makers' green	lb.	3.50 @
Red:		
Antimony, crimson, sulphuret of (casks)	lb.	.45 @
crimson, "Mephisto" (casks)	lb.	.60 @
crimson, "R. M. P."	lb.	.65 @
Antimony, golden sulphuret of (casks)	lb.	.20 @ .22
golden sulphuret (States)	lb.	.35 @ .40
golden, "Mephisto" (casks)	lb.	.33 @
golden, "R. M. P."	lb.	.33 @
red sulphuret (States)	lb.	.25 @ .30
vermilion sulphuret	lb.	.55 @
Arsenic, red sulphide	lb.	.18 @
Indian	lb.	.14 @ .16
Para toner	lb.	2.25 @
Red excelsior	lb.	.19 @ .22
Toluidine toner	lb.	4.25 @
Iron oxide, reduced grades	lb.	.05 @ .14
pure bright	lb.	.15 @ .17
Spanish bright	lb.	.05 @ .06
Venetian	lb.	.02½ @ .07
Oil soluble aniline, red	lb.	1.50 @ 2.00
orange	lb.	1.75 @
Oximony	lb.	.18 @
Vermilion, American	lb.	.25 @ .30
artificial	lb.	.37 @
English quicksilver	lb.	1.70 @ 1.75
Rubber makers' red	lb.	1.35 @ 4.00
purple	lb.	2.50 @
White:		
Aluminum bronze, C. P.	lb.	.65 @
superior	lb.	.75 @
Lithopone, domestic	lb.	.07¾ @ .08¼
Ponolith (carloads, factory)	lb.	@
Rubber-makers' white	lb.	.11¼ @
Zinc oxide, Horsehead (carload, factory):		
"XX red"	lb.	.10 @ .10½
"Special"	lb.	.10½ @ .11
French process, red seal	lb.	.11¼ @ .11¾
green seal	lb.	.12¼ @ .12¾
white seal	lb.	.13½ @ .13¾
(States)	lb.	@
Azo (carload, factory):		
ZZZ, lead free	lb.	.10 @ .10¼
ZZ, under 5% leaded	lb.	.09 @ .09¼
Z, 8-10% leaded	lb.	.08¼ @ .08½
Yellow:		
Cadmium, sulphide, yellow, light, orange	lb.	1.50 @ 1.65
red	lb.	1.85 @
Chrome, light and medium	lb.	.35 @
Ochre, domestic	lb.	.02½ @ .06
imported	lb.	.04¼ @ .08½
Oil, soluble aniline	lb.	1.50 @
Rubber makers' yellow	lb.	1.50 @ 2.50
Zinc chromate	lb.	.55 @
COMPOUNDING INGREDIENTS.		
Aluminum flake (carload)	ton	30.00 @
silicate	ton	30.00 @ 35.00
Ammonia carbonate, powdered	lb.	.17¾ @
Asbestine (carloads)	ton	30.00 @
Barium, carbonate, precipitated	ton	100.00 @
sulphide, precipitated	lb.	.05 @
dust	ton	100.00 @

Barytes, pure white (f. o. b. works)	ton	$[illegible] @
off color	ton	[illegible] @
uniform floated	ton	[illegible] @
Basofor	lb.	[illegible] @
Blanc fixe	lb.	.05½ @
Bone ash	lb.	.10 @
[illegible] filler		[illegible] @
Chalk, precipitated, extra light	lb.	.05 @ .05½
heavy	lb.	.04 @ .04½
China clay, Dixie Blue Ridge	ton	20.00 @
domestic	ton	[illegible] @ [illegible]
imported	ton	[illegible] @ [illegible]
[illegible]	ton	20.00 @
Cotton linters, clean mill run, f. o. b. factory	lb.	.03 @ .03½
Fossil flour (powdered)	lb.	.03½ @
(bolted)	lb.	.04 @
Diatomite	lb.	.03 @ .04
Glue, high grade	lb.	.35 @ .45
medium	lb.	.30 @ .35
low grade	lb.	.20 @ .25
Graphite, flake (400-pound bbl.)	lb.	.10 @ .30
amorphous	lb.	.04 @ .08
Ground glass FF. (bbls.)	lb.	.03 @
Infusorial earth (powdered)	lb.	.03½ @
(bolted)	lb.	.04 @
Liquid rubber	lb.	.18 @
Mica, powdered	lb.	[illegible] @
Pumice stone, powdered (bbl.)	lb.	.05 @ .10
Rotten stone, powdered	lb.	.02½ @ .04½
Rubber paste		.19 @ .22
Rub-R-Glu	lb.	@
Silex (silica)	ton	25.00 @ 40.00
Soapstone, powdered gray (carload)	ton	25.00 @
Starch, powdered corn (carload, bbls.)	cwt.	6.09 @
(carload, bags)	cwt.	5.62 @
Talc, powdered soapstone	ton	20.00 @
Terra blanche	ton	22.00 @ 32.00
Tripoli earth, air-floated, cream or rose	ton	50.00 @
white	ton	52.50 @
Tyre lith	ton	110.00 @
Whiting, Alba (carloads)	cwt.	1.00 @
Columbia	cwt.	.80 @
commercial	cwt.	1.40 @
English cliffstone	cwt.	2.00 @
gilders	cwt.	1.45 @ 1.55
Paris, white, American	cwt.	1.75 @
Quaker	ton	16.00 @
Super	ton	30.00 @ 32.50
Wood pulp, imported	lb.	.03¾ @
XXX	ton	75.00 @
X	ton	65.00 @
Wood flour, American	ton	50.00 @

MINERAL RUBBER.

Elateron (carloads)	ton	60.00 @
(less carloads)	ton	63.00 @
Gilsonite	lb.	.03¾ @
Genasco (carloads, factory)	ton	62.50 @
(less carloads, factory)	ton	64.50 @
Hard hydrocarbon	ton	35.00 @ 40.00
K-X	ton	@
K. M. R.	ton	@
M. R. X.	ton	
Pioneer, carload, factory	ton	60.00 @
less carload, factory	ton	65.00 @
Raven M. R.	ton	50.00 @ 70.00
Refined Elaterite	ton	@
Richmond	ton	75.00 @
No. 64	ton	44.00 @
318/320 M. P. hydrocarbon	ton	50.00 @ 60.00
Robertson, M. R. Special (carloads, factory)	ton	82.50 @ 85.00
M. R. (carloads, factory)	ton	60.00 @
M. R. (less car loads factory)	ton	61.50 @
Rubrax	ton	60.00 @
Synpro, granulated	ton	85.00 @
Walpole rubber flux (factory)	lb.	.05 @

OILS.

Avoilas compound	lb.	.16 @ .18
Castor, No. 1, U. S. P.	lb.	.20 @
No. 3, U. S. P.	lb.	.19 @
Corn	lb.	.18 @
Corn, refined Argo	cwt.	20.06 @
Cotton	lb.	.17 @
Glycerine (98 per cent)	lb.	.23½ @ .24
Linseed, raw (carloads)	gal.	1.67 @
Linseed compound	gal.	.85 @
Palmoline	lb.	.14 @ .15
Palm (Lagos)	lb.	.13 @ .18
Peanut	lb.	.20 @
Petrolatum	lb.	.10 @
Petroleum grease	lb.	.07½ @ .09
Pine, steam distilled	gal.	1.90 @ 2.00
Rapeseed, refined	lb.	.22 @
blown	lb.	.22 @
Rosin	gal.	.65 @ 1.05
Synpro	gal.	.90 @
Soya bean	lb.	.18 @
Tar	gal.	.42 @

RESINS AND PITCHES.

Balsam, fir	gal.	$1.75 @ [illegible]
Cantella gum	lb.	.55 @
Cumar resin, hard	lb.	.12 @ .16
soft	lb.	.09 @ .13
Tar, retort	bbl.	15.00 @ 15.50
kiln	bbl.	14.75 @ 15.00
Pitch, Burgundy	lb.	.11 @
coal tar	lb.	.01½ @
pine tar	lb.	.04 @
ponto	lb.	.14 @
Rosin	bbl.	16.95 @ 21.75
granulated	lb.	None
fused		None
Rosin, K	bbl.	19.25 @
strained	bbl.	20.00 @
Shellac, fine orange	lb.	1.15 @

SOLVENTS.

Acetone (98.99 per cent drums)	lb.	.26 @
methyl (drums)	gal.	1.50 @
Benzol, water white	gal.	.28 @ .33½
Beta-naphthol	lb.	.90 @
Carbon bisulphide (drums)	lb.	.07 @ .08½
tetrachloride (drums)	lb.	[illegible] @ .14
Naphtha, motor gasoline (steel bbls.)	gal.	.32 @
73 @ 76 degrees (steel bbls.)	gal.	.40 @
70 @ 72 (steel bbls.)	gal.	.38 @
68 @ 70 degrees (steel bbls.)	gal.	.37 @
V. M. & P. (steel bbls.)	gal.	.29 @
Toluol, pure	gal.	.31 @ .36½
Turpentine, spirits	gal.	1.80 @
wood	gal.	1.78 @
Osmaco reducer	gal.	.65 @
Xylol, pure	gal.	.35 @ .45
commercial	gal.	.35 @ .40

SUBSTITUTES.

Black	lb.	.10 @ .22
White	lb.	.11 @ .24
Brown	lb.	.15 @ .23
Brown factice	lb.	.11 @ .23
White factice	lb.	.12½ @ .24½
Paragol, soft and medium (carloads)	cwt.	18.58 @
hard	cwt.	18.08 @

VULCANIZING INGREDIENTS.

Lead, black hyposulphite (Black Hypo)	lb.	.39 @
Orange mineral, domestic	lb.	.15¼ @
Sulphur chloride (jugs)	lb.	.20 @
(drums)	lb.	.07 @
Sulphur, flour, Brooklyn brand (carloads)	cwt.	3.40 @
Bergenport brand (carloads)	cwt.	3.65 @
superfine (carloads, factory)	cwt.	2.00 @ 2.25

(See also Colors—Antimony.)

WAXES.

Wax, beeswax, white	lb.	.68 @
ceresin, white	lb.	.16 @ .20
carnauba	lb.	.45 @
ozokerite, black	lb.	.60 @
green	lb.	.60 @
Montan	lb.	.25 @
paraffine, refined 118/120 m. p. (cases)	lb.	.12 @
123/125 m. p. (cases)	lb.	.12½ @
128/130 m. p. (cases)	lb.	.14 @
Sweet wax	lb.	.14 @

UNITED STATES PRODUCTION OF ZINC PIGMENTS, 1852-1919.

Year	Zinc Oxide.		Zinc-Lead and Leaded Zinc Oxide.		Lithopone.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.
1852-1879	170,000	$12,000,000	......	......	......	......
1880-1889	143,077	10,801,338	......	......	......	......
1890-1899	254,102	18,724,890	......	......	......	......
1900-1909	614,728	50,260,199	......	......	......	......
1901-1909	......	......	61,283	$4,882,206	......	......
1906-1909	......	......	......	......	37,714	$2,806,614
1910	58,481	5,238,945	6,823	621,120	12,655	916,512
1911	63,827	5,816,370	6,765	561,560	16,866	1,243,108
1912	84,002	7,482,409	11,410	953,800	24,220	1,702,119
1913	75,700	7,161,528	9,421	745,698	29,685	2,170,445
1914	82,809	7,850,350	11,317	977,431	32,819	2,490,530
1915	109,261	11,984,470	18,758	1,724,145	46,494	3,760,472
1916	100,339	18,816,378	23,003	3,053,060	51,291	5,798,927
1917	107,586	21,589,976	23,450	3,728,976	63,713	7,406,896
1918	100,286	20,560,247	26,714	4,480,565	62,403	7,923,276
1919	117,639	20,591,877	27,591	4,009,024	80,989	10,266,230
Totals	2,081,837	$218,878,977	226,535	$25,737,585	458,849	$46,485,129

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC GUTTA-PERCHA

Vol. 62 JULY 1, 1920 No. 4

TABLE OF CONTENTS.

Editorials: Pages
- Solid Tires Not Doomed ... 633
- American Plantation Rubber ... 633
- The Goodyear Vulcanization "Accident" ... 633-634
- Dangerous Demands of Labor ... 634
- Truck Trains and Tires ... 634
- Minor Editorial ... 634

A Modern Tire Plant Layout. By M. A. Pearson—Illustrated 635-639

More About Jar Rings and Poisoned Olives ... 639

Tire Fabric and Long-Staple Cotton. By L. W. Alwyn-Schmidt 640-641

Electric Drive in a Tire and Tube Plant. By H. F. Barton—Illustrated 642

Standard General Methods for Testing Cotton Fabrics ... Illustrated 643-645

Judicial Decisions ... 646

The Manufacture of Blow-Out Patches. By Arthur C. Squires—Illustrated 647-648

War Department Specifications for Mechanical Rubber Goods—II ... 649-651

Testing Machines ... Illustrated 652-653

Proposed Tentative Specifications for Adhesive Insulating Tape ... 653

Chemistry:
- What the Rubber Chemists Are Doing ... 654-655
  The Determination of Substitute in Rubber.
- Methods of Analysis ... 655
  Rapid Determination of Golden Antimony in Rubber Goods. Gasoline Distillation.
- Chemical Patents ... 656
- Laboratory Apparatus ... Illustrated 656

Machines and Appliances ... Illustrated 657-659
Hydraulic Lead-Encasing Press. Solid Tire Press Cranes. A New Solution Mixer. Tire Casing Inspecting Machine. Machine for Cutting Rubber Washers. Rubber Solvent Storage System. Special Scale for Rubber Compounding.

Machinery Patents ... Illustrated 659
Variable Speed Drive for Rubber Mills. Stripping Dipped Goods from Curing Forms. Improved Air Bag. Applying Repair-Tires to Worn Casings. Other Machinery Patents.

Process Patents ... 659-660

Trade Opportunities ... 660

New Goods and Specialties ... Illustrated 661-663
The "Brownfoot" Rubber Boot. New Single Solid Tire. An Inner Tube for Cord Tires. Tennis Racket Cover. Patented Repair Kit. English Sole Pads. Molded Rubber Fish Lures. Four-Hole Bagpipe Balloons. Inner Tube That Minimizes Blow-Outs. "Safety First Pull-Over" Glove. Rubber Retainer for Batteries. Achilles Tires. A Practical Mat for the Running Board. A Semi-Circular Cut-Out Rubber Mat. Rubberized Cotton Gloves. The Burke "Grand Prize" Golf Ball. The "Jayhawk" Golf Ball. Ingenious Valve Shut-Off for Syringes. The "Flex-O-Tyte" Fan Belt. Individual Tub for Infants.

The Rubber Association of America—Activities of ... 664-665

New Trade Publications ... 665

Editor's Book Table ... 665-666
"The Preparation and Vulcanization of Plantation Pará Rubber." "Canadian Trade Index, 1920-1921."

Interesting Letters from Our Readers ... 666
East African Rubber Possibilities. In Memory of a Great French Aviator.

The Obituary Record ... 666-667
Edwin C. McGraw (Portrait). Robert I. Monroe.

Determination of the Softening of Plastic Materials. Illustrated 667

Storage Battery Developments on the Pacific Slope— Special Correspondence 668

American Rubber Trade—News Notes and Personals 669-682
- Dividends ... 669
- Financial Notes ... 669-670
- New Incorporations ... 670-671
- William Wallace Wildman ... Portrait and Sketch 671
- Personal Mention ... Illustrated 671-672
- Frank G. Mauthe ... 672
- East and South ... Illustrated 672-674
- New Jersey ... By Our Correspondent 674
- Rhode Island ... By Our Correspondent 674-675
- Massachusetts ... By Our Correspondent 675-676
- Thomas Midgley ... Portrait and Sketch 676
- Frank K. Starbird ... Portrait and Sketch 677
- Ohio ... By Our Correspondent—Illustrated 677-679
- Mid-West ... By Our Correspondent—Illustrated 679-680
- John E. Shaw ... Portrait and Sketch 680
- Pacific Coast..By Our Correspondent—Illustrated 680-682

Designs ... Illustrated 683
United States. Canada.

Pneumatic Tread Designs Registered September, 1918, to September, 1919 ... Illustrated 683

Foreign Rubber News:
- Great Britain ... By Our Correspondent 684-685
- European Notes ... 685
- Netherland Indies Notes ... 686

Planting:
- Far Eastern Notes ... 686
- African Notes ... 686-687
- South American Notes ... 687
- Rubber Dormant in Dutch and British Guiana ... 687

Present Status of Long-Staple Cotton ... 688

Canadian Notes ... 688

Patents Relating to Rubber ... 691-692
United States. Canada. United Kingdom. New Zealand. Germany. France.

Trade-Marks ... 692-693
United States. Canada. United Kingdom. France.

Markets:
- Crude Rubber ... 694
  - Highest and Lowest New York Prices ... 695
  - Amsterdam Rubber Market ... 695
  - Antwerp Rubber Market ... 695
  - Singapore Rubber Market ... 695
- Reclaimed Rubber ... 694
- Rubber Scrap ... 702
- Cotton and Other Fabrics ... 702-703
- Chemicals and Ingredients ... 703-704

Statistics:
- Antwerp Rubber Arrivals ... 695
- Brazil, Manaos Exports During April ... 700
- Canada, Statistics for March, 1920 ... 700
- Ceylon Rubber Imports and Exports ... 695
- Deli (Sumatra) Rubber Exports ... 695
- Federated Malay States Rubber Exports ... 695
- Java Rubber Exports ... 695
- Straits Settlements Rubber Exports ... 695
- United Kingdom, Statistics for April, 1920 ... 700
- United States:
  - Crude Rubber Arrivals at Atlantic and Pacific Ports as Stated by Ships' Manifests ... 696-697
  - Custom House Statistics ... 701-702
  - Imports by Months for 1920 ... 697
  - Exports of India Rubber Manufactures During April, 1920 (By Countries) ... 698-699
  - United States Statistics for April ... 699

THE GUTTA PERCHA & RUBBER MFG. CO.

Established 1855

MANUFACTURERS OF

RUBBER BELTING, PACKING, HOSE, MATS, MATTING

AND

MECHANICAL RUBBER GOODS OF EVERY KIND

Warerooms: Nos. 126-128 Duane St., NEW YORK

BRANCH STORES:

301 West Randolph St.	71 Pearl Street	241 Chestnut Street	34 Fremont Street
CHICAGO	BOSTON	PHILADELPHIA	SAN FRANCISCO

HENRY SPADONE, Pres. WALTER W. SPADONE, Vice-Pres. ALFRED A. SPADONE, Sec'y GEO. B. DICKERSON, Treas.

HOOD RUBBER CO.

MANUFACTURERS OF

Rubber Boots and Shoes

Rubber Sole Canvas Shoes

Tennis Shoes

Pneumatic Tires and Tubes

Solid Tires for Trucks

WATERTOWN, MASS.

---

64 YEARS

1856 TYRIAN TRADE MARK ESTABLISHED 1856 1920

Tyer Rubber Co., Inc.

Manufacturers of

DRUGGISTS' RUBBER GOODS

"TYRIAN"

Automobile Tires and Inner Tubes
Stationers' Rubber Bands

RUBBER MOLD WORK A SPECIALTY

ANDOVER, MASS., U. S. A.

H. A. ASTLETT & CO.

113-117 Pearl Street, New York

CABLE ADDRESS, "ASTLETT," NEW YORK

CRUDE
WASHED & REFINED
RUBBER

LAMP BLACK and WHITING

ADVANTAGEOUS PRICES
SPOT OR CONTRACT

STRESEN-REUTER & HANCOCK, Inc.
122 South Michigan Avenue
Chicago, Illinois

INDIA RUBBER WORLD

CAOUTCHOUC HEVEA BRASILIENSIS FOUNDED 1889 DICHOPSIS GUTTA GUTTA-PERCHA

U. S. Pat. Off. Reg. United Kingdom

Edited by HENRY C. PEARSON

Vol. LXII. No. 5. AUGUST 1, 1920 35 CENTS $3.00 Per Year. $3.50 Abroad.

Entered as second-class matter October 4, 1899, at the post office at New York, N. Y., under the Act of March 3, 1879.

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC GUTTA-PERCHA

Reg. United States Pat. Off. Reg. United Kingdom.

Published on the 1st of each month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.

Telephone—Bryant 2576.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, F.R.G.S., Editor

Vol. 62 AUGUST 1, 1920 No. 5

Subscription: $3.00 per year, $1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, $3.50 (or equivalent funds) per year, postpaid.

Advertising: Rates will be made known on application.

Remittances: Should always be made by bank draft. Post Office or Express money order on New York, payable to The India Rubber Publishing Company. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

Discontinuances: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

TABLE OF CONTENTS ON LAST PAGE OF READING.

THE COMING RUBBER SHORTAGE.

Under this definitely startling caption, Zorn & Leigh-Hunt (London), issue a four-page folder combining statistics and conclusions that will give pause to manufacturers and encouragement to planters. Were not the figures accurate and the conclusions apparently sound, one would take it as promotion talk. To quote the summary of the argument:

> "It will be noticed from the above statistics that for the next three years the increase in the world's production of rubber is not likely to exceed 6 or 7 per cent per annum. For the past five years the manufacturing demand has absorbed increases averaging more than 25 per cent per annum. Even if during 1921-1923 the rate of increasing demand should drop to 5 per cent per annum, the world's output will be fully used up. If the rate increases at anything more than 5 per cent we must inevitably reach a period of actual shortage. For instance, supposing that the average increase of the last five years should be cut down to one-half (12½ per cent instead of 25 per cent per annum) we might by the end of 1921 be faced with a shortage of 30,000 tons of rubber, to be followed by another two years' increasing stringency. The effect of an approaching shortage will make itself felt in the market some time before the position actually arises, as far-sighted consumers of rubber will not quietly wait to be 'caught short.' This no doubt explains why it is possible to-day to sell large quantities of rubber for a couple of years ahead at a substantial premium, over the 'spot' price; forward contracts in fact, have this year been made up to *2s. 10½d.* per pound for delivery in 1921. In a word, in the absence of a setback in the trade of the world, there is practically no risk of rubber falling below its present price (except as a temporary fluctuation) while the chances of a rise are almost startling, in view of the statistical position revealed."

NO PROFITEERING IN RUBBER.

Profiteers try to palliate their rapacity with the plea that they did not press their advantage nearly as far as they had a chance. In much the same way an impeached British administrator in India once sought to extenuate his crimes of extortion by saying that when he considered the magnitude of his opportunities he was actually amazed at his moderation.

All the opportunities for gouging the public during and since the Great War have presented themselves to rubber manufacturers as well as to others, but to their credit it can truthfully be said that as a class they neither took unfair advantage of the rising price trend nor expressed regret at not having seized upon an abnormal state of trade as a pretext for exacting an unreasonable profit.

Proof of this fact is afforded by the price of rubber tires. In 1910 one popular make of 30 by 3½ fabric tire cost $26. In 1920 the same tire sells for $23.20. In 1910 the 33 by 4 size of the same tire sold for $44 and the 34 by 4 for $46.50, as compared with the 1920 prices of $38.60 and $39.60, respectively. Even more remarkable are the price decreases on the larger size tires. Yet, despite the fact that they have lessened the charge for their products, the tire manufacturers have had to cope with such drawbacks as a 250 per cent increase in the cost of cotton fabric and a 200 per cent rise in wages since 1910, not to mention greatly enhanced prices of compounding ingredients, building materials, machinery, etc.

Luckily, as was pointed out in a recent issue of this journal, raw rubber has remained the one normal commodity, that, despite all the commercial upheavals due to war and the enormous and world-wide demand for it, is still marketed at about the same old, antebellum price. But even the continued cheapness of the basic material does not account for the low cost of present-day rubber products. That explanation is to be found in the remarkable enterprise of rubber manufacturers, who, in the past few years, have, with the aid of chemists, engineers and efficiency experts,

devised most ingenious methods of quickening processes, new compounds and labor-saving machinery and by cultivating "human" relations with their employes, have not only speeded up production in a marvelous degree but are also turning out better goods at the lower price level.

PLANTATION FUTURES.

A friend in the Far East advises the Editor of this journal that within five years the rubber plantations in India, Ceylon and the Malay States will be run by Soviets. This change of ownership will come about through a union of the Russians under Lenine and the Hindus and Mohammedans of India, who will throw off the "British Yoke." This would mean $10 rubber and a greatly lessened production. It would also be "Red Rubber" in the worst sense of the term.

If memory does not play us false the same source predicted the destruction of Malaysian plantations by disease before 1918. The disease came but the planters promptly stamped it out. So, too, will the red disease be stamped out in the Far Eastern possessions.

Nevertheless, not that we believe there is any such danger in sight, America as the biggest user of crude rubber should look far ahead for its supplies. The Philippines for planting are ideal once the Filipino will allow it to be done as the rest of the world does it. Then, too, there are our own rubber producers guayule and *Chrysothamnus*. Of the latter, Luther Burbank, the great plant wizard, in a letter to one of our staff, says that there is not a shadow of a doubt that by analysis of the different individual plants from different localities the rubber content of some will be found to be double that of others, and by starting with these high rubber content plants, and growing from these, any good plant breeder could originate a plant in a reasonably short period that would produce twice as much as the average wild ones do. He says this is a very moderate estimate, as it would not be surprising that a plant should be constructed which would produce ten times the results of the wild ones. Of course vigor is one of the things to be considered, and possibly compactness of growth, and other matters which would come up during the work of improvement.

A seven per cent content has already been found. Double this would be fourteen per cent and ten times as much would be a bonanza. Anyhow, fourteen or seventy, it's worth working for.

LEATHER RUBBER FOOTWEAR.

For some time rubber has been closely pressing leather in footwear lines. The rubber heel and the rubber fiber sole have won a notable victory over their leather counterparts. So far, however, the fine leather shoe has not been disturbed in its supremacy. The invention by the brilliant young English chemist, S. J. Peachey, of a new process of vulcanization by the use of sulphur dioxide and hydrogen sulphide opens new fields of which that now filled by leather footwear is one. By the new process goods of any color, and of almost any texture may be produced without heat or pressure. In other words the fine leather shoe can now be equalled and probably excelled in rubber. Furthermore, this may be done along rubber lines of building and cementing and without the vast array of special machines that are needed to stitch, polish, buff and shape leather shoes. It looks as if a footwear revolution were toward.

OPEN SHOP CITIES.

Students of industrial conditions attach no little significance to the figures given by the United States Census Bureau showing that the two open-shop cities, Los Angeles, California, and Akron, Ohio, have made a greater growth in the past ten years than any other two cities in their respective classes in the Union. Los Angeles scores a gain of 80.3 per cent and Akron an increase of 201.7 per cent, while Spokane, Washington, lost .2 per cent and Paterson, New Jersey, gained but 8.2 per cent. In both of the latter cities the closed shop still largely obtains, and agitators have done much to foment discord between capital and labor, discouraging not only the extension of old industries but also the starting of new enterprises. The metropolis of the Pacific Coast, on the other hand, has fought long and successfully for industrial freedom and has flourished like the proverbial green bay tree. And in like manner the nation's great rubber center in Ohio, free of the shackles of the closed shop, has prospered as has no other city of similar size in the country. There, under the piece-work system, production is always kept at high pitch, and there, the diligent, faithful worker can rest assured that extra pay will always reward his extra effort, instead of his wage being measured by the meager performance of the laggard and the shirker.

In an article on labor turnover in tire production, H. O. Smith of the Ajax Rubber Co., Inc., advances an excellent argument to encourage apprenticeship in the tire industry. He says:

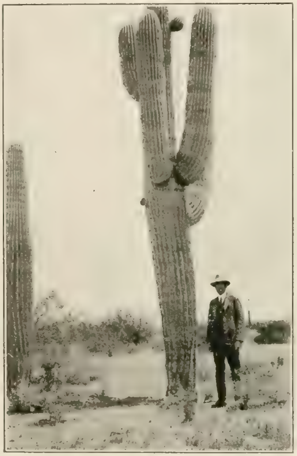
> "There is a decided advantage in the fact that the tire business attracts the fellow from 18 to 25 years old who is thoughtful and considers his opportunities, and who, realizing when it is too late that he has missed the opportunity of an apprenticeship and learning a trade, finds in the tire industry a remaining chance to develop a possible earning power quite equal to that of the machinist, the carpenter, or the pattern maker. It requires only 60 to 90 days to become an efficient tire maker, while an apprenticeship in other trades usually covers three to four years. For this reason the tire industry can draw from the best untrained material in America."

Experiments With a New Cactus Rubber.

By Emmet S. Long.

It has recently been the writer's privilege to experiment with a gum extracted from the American cactus and the results have so far been so entirely satisfactory that the subject should undoubtedly be of interest to every one connected with the rubber industry. The war has certainly disclosed the necessity, or at least the desirability, of producing on as large a scale as possible a portion at least of the rubber requirements of this country and for this reason, as well as for the economic betterment of the rubber industry itself, there has resulted considerable activity in the investigation of this important question.

Several years ago the writer had occasion to do considerable experimenting with the extraction and compounding with rubber of a gum derived from the Ocotillo plant, more particularly for the purpose of obtaining a gum which would replace guayule. This plant ranges from five to twenty-five feet in height, growing extensively in certain parts of Arizona and California. The results were satisfactory to a certain extent, but due to the solvent-distillation method of extraction employed, the gum contained a large percentage of resins which seriously affected the cure when used in large percentages in the compound. Later the destructive-distillation process with subsequent refining was evolved with the assistance of government chemists, and it is reported that a much superior product is now being produced in large quantities at the large plant in Arizona.



An Arizona Cactus.

The cactus gum mentioned at the beginning of this article is found in paying quantities in two different varieties of cactus, one the spineless, or cultivated cactus developed by Burbank and the other the prickly pear or wild species. Spineless cactus has been raised in many parts of Southern California as food for cattle. It was soon learned, however, that many cattle died, probably as a result of the insoluble gum content. The plant consists of a number of lobes somewhat similar in shape to an inverted hot water bottle, each lobe projecting outward and upward from the edge of the one underneath, the number of lobes depending upon the age of the plant. It is easily propagated by breaking off these lobes and planting them in the ground. The plant is very hardy and has the advantage of being easily cultivated upon practically worthless soil or in localities where the rainfall is very slight.

Prickly pear or *Opuntia vulgaris* grows extensively in many parts of Arizona, California, Nevada and other tropical parts of the United States. It is somewhat similar in structure to the spineless cactus, but is covered with long, sharp needles. It bears an edible fruit of a purplish color also covered with spines. Like the spineless, it is very easily propagated and attains a height of seven or nine feet. Unlike Ocotillo and many other gum-bearing plants, the rubber in these two varieties of cactus occurs as a latex and yields a sticky, white liquid from the abraded surface if pressure be applied by the fingers. By special treatment of the latex and subsequent refining, an amber colored gum resembling smoked sheet in color and guayule in physical properties is obtained, although the gum when thoroughly dried is considerably less plastic than guayule. It is reported that the gum can be produced at a price to compete favorably with guayule and crude rubber.

Following is a summary of some of the experiments made with gum from the spineless cactus:

Sample 1.

	Per Cent.
Smoked sheet rubber	50
Cactus rubber	40
Compound (mineral ingredients)	10

This compound was mixed upon the mill in the usual manner and contained only the amount of sulphur usually required to vulcanize a stock having 90 per cent smoked sheet. It mixed easily on the rolls at a much lower temperature than that which would have been required for pure smoked sheet. The next day test strips were cured in the press and were found to have high tensile strength and elasticity, showing that the gum vulcanizes perfectly in about the same length of time required for plantation rubbers. Another portion was used to friction a sample of belting duck which was found upon examination to be thoroughly impregnated with the gum. A very tacky cement was made from the remaining portion by dissolving in benzol.

Sample 2.

	Per Cent.
Smoked sheet	20
Auto reclaim	20
Cactus rubber	20
Compound	40

In spite of the fact that this stock was mixed on a relatively cold mill, it retained a sticky surface after calendering and showed no tendency to bloom in the raw state. It would seem from this that the use of the gum in repair stocks and especially in those containing large amounts of carbon black would be advantageous, due to the necessity of preserving a tacky surface indefinitely, and the lower temperature at which the stock could be milled would minimize the danger of burning when use is made of certain organic accelerators. Part of Sample 2 was used to skim-coat and cover the fabric mentioned above, which was then made into a piece of belting.

Sample 3.

	Per Cent.
Smoked sheet	10
Auto reclaim	20
Cactus rubber	17
Compound	53

It was the object of this mixture to estimate the value of the gum in a cheaper compound containing a larger percentage of minerals. No difficulty was encountered in milling and the stock was made into various kinds of articles of comparatively good quality.

Sample 4.

	Per Cent.
Cactus rubber	10
Reclaimed	60
Compound	30

This was a regular heel compound in which 10 per cent smoked

sheet would ordinarily have been used. The smoked sheet was replaced entirely with the cactus rubber without reducing the quality of the heels so far as could be determined. It is interesting to note that the reclaimed rubber used in this case would not stick to the rolls and could not be milled until about two pounds of the cactus rubber was added, when it immediately began to spread out evenly over the roll and continued to adhere thereto until the milling was completed. A number of rubber heels were made from this stock, all of which appeared to be of good quality.

It is the opinion of the writer, as well as of others who assisted in the experiments, that the gum is in every way equal to guayule and in some respects superior, among which may be mentioned the readiness with which it vulcanizes and the extent to which it will actually replace crude rubber without an apparent reduction in the quality of the finished product. This would evidently place it in a class with crude rubber itself. For use in frictions where penetrating qualities are necessary the gum possesses this property to a marked degree.

The results of these experiments indicate that it may be only a question of time until America may have a new and important industry—the production of rubber from her deserts and waste lands. Los Angeles is already the cynosure of the eyes of the rubber world as the nucleus of a new and rapidly growing rubber manufacturing center. The production of long-staple cotton of highest quality in Southern California has quickly sprung from infancy to a well recognized commercial success and if the cactus rubber possibilities materialize, the United States and even California will be able to produce a complete tire from her own raw materials.

Old and New Methods in Cotton Warehousing and Financing.

By Richard Hoadley Tingley.

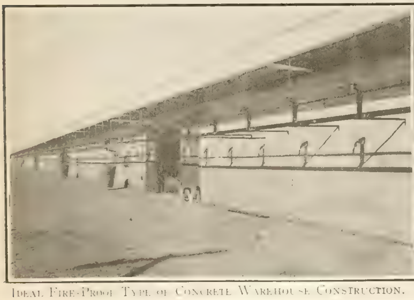
"The financing of a cotton crop is one of the most difficult, and at the same time one of the most important problems confronting the southern farmer and business man." This is quoted from an address made in 1915, by R. L. Nixon, specialist in warehousing of the Bureau of Markets, Department of Agriculture. At that time cotton was worth approximately ten cents a pound and the South was suffering from a disruption of trade caused by the war. With prices practically four times those of 1915, the difficulty and importance of the problems become intensified in proportion.

A COTTON CROP WORTH TWO AND A QUARTER BILLION DOLLARS.

It is a recognized fact that but little cotton would be stored or insured were it not necessary to do so in order to negotiate loans with cotton as collateral. Banks have always been willing to advance money on cotton on liberal terms when properly warehoused and insured up to the limit of their capacity but, with a cotton crop worth $750,000,000, as it was in 1915, and a crop valued at $2,250,000,000 as is this year—and all of it credit cotton at one stage or another, and sometimes oftener than at one stage—the problem assumes gigantic proportions. Such enormous sums, of necessity, take it out of the hands of the comparatively small coterie of southern and northern banks that heretofore found little difficulty in handling the business, and call for nation-wide bank participation—a participation made possible by the provisions of the Federal Reserve Banking Act.

LACK OF UNIFORMITY IN WAREHOUSE LAWS AND RECEIPTS.

There are many stumbling blocks in the way of a nation-wide participation in cotton financing, many of which will have to be removed before cotton credits can be placed on a liquid footing commensurate with the importance of the business. In the first place, except in the cities of the Cotton Belt and the large commercial centers of the North and East, the banks do not understand cotton paper, it has been outside the line of their activities, and in the second place, the warehousing laws of the country are by no means standardized. Practically every state has its own laws regulating warehouse operations, which differ, often in essential features, from those of other states. It cannot be expected that a national bank officer in, say, Minneapolis is familiar with all of these laws. To keep himself informed, would be an undertaking for which he has not the time. Cotton paper, based on warehouse receipts for goods in store at, say, Atlantic, Georgia, does not interest him.



Ideal Fire-Proof Type of Concrete Warehouse Construction.

Interior of a Houston, Texas, Cotton Warehouse, Protected against Fire by Automatic Sprinklers.

In the third place, there is a woeful lack of uniformity in the receipts given for goods in store issued by warehousemen in different sections of the country. There is no standardized practice in this respect and, in consequence, cotton paper to which is attached a receipt for the cotton stored in a warehouse in, say, Houston, Texas, is not interesting to a banker of Norfolk, Virginia. He not only does not understand the Texas laws that regulate and prescribe the form of receipt but he does not

know the warehouseman at Houston, and cannot take the trouble to investigate his responsibility

COTTON WAREHOUSES OWNED BY BORROWERS.

It is a well-known fact that practically every cotton warehouse in the South is owned, either directly or indirectly, by the cotton factors and merchants of the locality. Few of these have ever been operated as independent business enterprises, but rather as adjuncts to the chief business of their owners—trading in cotton. Another disturbing factor in cotton financing, as it has been conducted in the past, is this fact of ownership. A cotton merchant in, say, Savannah, Georgia, has bought 100 bales of cotton which he proposes to hold for a future sale. He stores the goods with the X. Y. Z. Warehouse Company in which he is a large owner and possibly an officer or director. The receipt given him for the cotton so stored he takes to his local bank and negotiates a loan with it as collateral. The local bank officer knows perfectly well that he is a large owner in the warehouse and that, in loaning him money with this receipt as collateral he is leaving the cotton practically in the hands of the borrower instead of in the hands of an outside independent corporation——as is the theory of warehousing. Loans so made are therefore based more on the personal standing and integrity of the borrower than on the cotton represented by the receipt which he offers. The bank knows perfectly well that owing to his ownership and control he can take the cotton out of store and sell it and the bank will be none the wiser until afterwards.

Much the same condition obtains in the New England mill centers. There are few public cotton warehouses in the North and cotton is usually stored in the mill yards. Whatever loans are made by local banks with this cotton as collateral are based on the personal standing of the borrower rather than on the merchandize itself, for the New England banker knows well that the cotton for which he holds receipt is out of his jurisdiction and the technical fact that he holds a receipt for it, which he has taken as collateral security, cannot prevent the mill owner from using the cotton and he will be none the wiser until afterwards.

COTTON FINANCING—PRESENT PRACTICES.

I will illustrate further the system that has grown up as a precedent, of financing a cotton crop—a system that has grown obsolete with the advance of time and in the price of cotton, and demands revision, for it now requires more money to finance the cotton crop than any other of the principal crops raised in the United States.

Following the beginning of the crop movement, around September first, demand for funds is made upon local banks by the interior farming districts. These banks, in turn, call upon the large banking institutions in the cities. The first calls are usually for funds to pay for labor employed in picking and harvesting the crop, and for incidental expenses. Small farmers have usually been financed by the local storekeeper from the time of planting to the time of harvesting, but this merely shifts the burden of the bank from the farmer to the storekeeper.

The cotton factors are also dependent upon the local bank for financing their purchases and for their assistance in carrying the farmers. As a result the local bank may find its credit pretty well extended by the time the crop begins to move.

Financing the factors or cotton brokers is the next step. Bankers in the town where the cotton gins are located arrange for payment for the cotton sold by the factors, by furnishing cash tickets issued to the buyers. These tickets the banks hold as collateral. When sufficient cotton has accumulated to permit making a shipment, the local banker delivers the tickets to the agent of the railroad in his town and receives a bill of lading covering the shipment to a compress point.

After arrival of the cotton at the concentration points comes the demand of the mills and exporters. These demands begin in October and continue throughout the winter. From the time the cotton is picked until it has been converted into a manufactured product fully six months must elapse.

This old method of financing, which is based on single name paper with the staple as collateral, is giving way to the use of trade and bankers' acceptances, and the advantages resulting from such a system have been made possible by the provisions of the Federal Reserve Act.

To illustrate (I quote from John Bolinger of the Shawmut National Bank, Boston): "A Boston cotton broker purchases cotton to the value of $50,000 from a dealer in Galveston. As the Galveston man wants immediate payment for the staple, the buyer arranges with his bank in Boston for an acceptance credit for ninety days. The Boston bank notifies the Galveston cotton dealer that it will 'accept' his draft drawn at ninety days' sight, for $50,000, provided bills of lading and other documents are attached to the draft when presented. The Galveston dealer then delivers the cotton to a transportation company and secures a bill of lading for the shipment, which he attaches with invoice and other documents to a draft on the Boston bank. Taking this draft and documents to his own bank at Galveston he discounts it and receives payment for his cotton. The draft and documents are then forwarded to Boston by the Galveston bank for 'acceptance.' After acceptance the draft is returned to the Galveston bank, or may be sold in the open market and the amount placed to credit of its account. The Boston bank retains title to the cotton until its customer provides for the payment of the draft through resale of the cotton."

All of the above is based upon the fact of the warehousing of cotton under conditions now existing.

STANDARDIZED WAREHOUSES RECOMMENDED.

But let us inject a new feature into the transaction, namely, a standardized chain of cotton warehouses covering all important concentration centers of the South and consumption centers of the North, owned by one company and operated as a business proposition. The idea of such an organization has long been the dream of almost every one connected with cotton, no matter from what angle—and it goes without saying that every bank in the land would welcome it.

Such an organization should place itself in so strong a position financially that every bank in the country would recognize it at sight as being sound, dependable, and independent of the "trade." It should provide itself with a form of warehouse receipt that will be recognized as universal the country over so that a banker in, say, Cleveland, Ohio, or Bangor, Maine, will be as familiar with it as he is with the universal form of railroad bill-of-lading that now passes current the country over.

THE UNITED STATES WAREHOUSE ACT OF 1916.

Recognizing the need of innovation in cotton warehousing and in order to provide the machinery necessary for its accomplishment, Congress passed in August, 1916, the United States Warehouse Act. Amended in July, 1919, this act now offers to prospective warehousemen as well as to those already engaged in the business, an opportunity for standardizing their operations under the supervision of Uncle Sam and his Department of Agriculture, and many companies are already availing themselves of the provisions and privileges so offered.

There is nothing compulsory contained in the Act, but it provides for a permissive system of warehouses licensed by and bonded to the United States Government and operated under a system of government inspection and supervision. The Act also provides for the licensing of competent weighers and graders upon application.

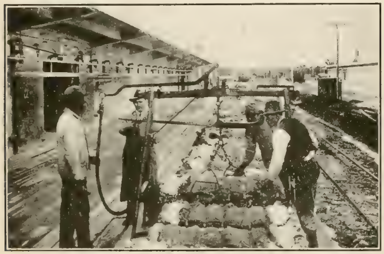
The purpose of the Warehouse Act is to create a warehouse receipt of unquestioned value, and one which will be acceptable to all bankers as security for obtaining loans, regardless of the location of the warehouse. In this way, warehousemen will furnish a receipt to their customers which will be of the ut-

most value to them as a negotiable paper, and enable them to borrow close to the actual value of their stored goods at cheaper interest rates. Thus they market their cotton slowly and in conformity with the needs of the manufacturers. The full description of the cotton stored required to be stated on the face of the receipt will enable the owner to know the value of his cotton and enable him to market it intelligently. The proper development of the warehouse will make possible the practice of marketing the cotton crop through the warehouse, and thus avoid the enormous losses resulting from weather damage.

FINANCING UNDER STANDARDIZED WAREHOUSING METHOD.

It will readily be seen that important advantage will accrue to the cotton trade as a whole by the formation of a large operating company, independently owned and controlled, conducting business under the provisions of the United States Warehouse Act with its amendments.

Let us go back to the Galveston dealer and his $50,000 sale to the Boston cotton broker and see how it would operate under



WEIGHING COTTON BALES AT WAREHOUSE PLATFORM.

the system herein described. The Boston broker could arrange for the storage of his purchase in the bonded warehouse at Galveston; he might move it to port at Savannah or Charleston and store it in a similar bonded warehouse; he might move it to New York, Providence, or New Bedford, and in each of these places he could lodge his cotton under the supervision of Uncle Sam whose receipt would satisfy any banker in the land in Boston, Minneapolis, Omaha, or Portland, Maine. Furthermore, if all of these warehouses were centrally owned and operated in chain, one receipt and one insurance policy would cover his cotton, no matter in which warehouse it was stored or while in transit from one house to another.

PROGRESS OF THE STANDARDIZED WAREHOUSE IDEA.

Emphasized by war experiences and the difficulties and uncertainties of transportation, and by the high price of cotton, cotton men of both the South and North have come together in an endeavor to standardize cotton warehousing and warehouse receipts, by the formation of a big corporation for the purpose. It is likely that some 80 or 100 "going" properties will come into the combination that will cover practically the entire field from Massachusetts Bay to Galveston. The National Association of Cotton Manufacturers endorses it. So does the Federal Reserve Board, for it sees in such a move a warehouse receipt issued by a warehouseman who is not interested in the ownership of the goods involved.

The World Cotton Conference held in New Orleans last October, composed of cotton men from all over the world and from every angle of the business, unanimously endorsed the plan by passing suitable resolutions to that effect.

A DISCOUNT CORPORATION TO HANDLE COTTON PAPER.

It is evident that cotton warehousing and cotton financing go hand in hand; indeed the two phases of the industry cannot well be separated. In order to furnish a broad market for the vast volume of cotton paper that will be created by putting into practice the innovations I have described, a discount corporation will be formed as an adjunct to the warehousing feature.

Under this dual system, several notable things will be accomplished, making for both improved conditions in the cotton trade and the stabilization of cotton prices. The smaller farmer will be benefited by being able to carry his cotton over a period of depressed prices. The grower or shipper, when storing cotton in a bonded warehouse under government control, would obtain a receipt which would be excellent collateral in case it was desired to hold the cotton for a better market. Such a receipt, being negotiable and guaranteeing the weight, could be converted into cash at any time or in any place. Spot cotton could be dealt in between persons entirely unknown to each other and rejections would cease. The southern producer would have everything to gain and nothing to lose by the proposal. The spinner would likewise benefit by the guaranty, but his chief gain would be the large supplies of cotton assembled at concentration points, thus insuring him against a scarcity of raw material, due to winter transportation difficulties and other obstacles. Last but not least, bankers would be supplied with a large amount of the most liquid and highest grade paper-acceptance on cotton.

SEPTEMBER MEETING OF THE RUBBER DIVISION OF THE AMERICAN CHEMICAL SOCIETY

The next meeting of the American Chemical Society will be held in Chicago, Illinois, September 7-10, when there will be a meeting of the Rubber Division.

At the spring meeting the question of trade names for accelerators and compounding ingredients was discussed. It was pointed out that thiocarbanilide was offered on the market under no less than six different names. There are accelerators offered which consist of a certain percentage of some common accelerator, the remainder being a cheap filling ingredient. One of the most notable examples of this type is a mixture of starch and alkali, which is now offered for sale under a trade name at a price which is out of all proportion to its cost. Similar conditions exist to a lesser degree in the market for compounding ingredients.

The Division wishes publicly to announce its stand in the matter, which is the reflection of the opinions of the members present at the last meeting. As a body organized for the advancement of the industry, it does not object to the proper use of a trade name for a product. By proper use, it says that it may be more convenient for the general public to use a trade name rather than a long chemical term. It includes under proper use the fact that the manufacturer shall willingly inform the users of his material what the constituents are which he offers in his product.

It must strenuously objects to the marketing of unknown products which are sold under trade names and whose true constituents are supposed to be kept secret. This objection is twofold: it feels that the advancement of the industry is retarded by the use of unknown materials, and also that the public becomes the "goat" by the indiscreet use of unknown accelerators.

In order that the members of the Division may have as full information as possible, it invites statements which have to deal with the subject matter presented, from manufacturers or jobbers of materials which are sold under trade names. The statements made concerning these products may be made publicly or to the Secretary of the Rubber Division.

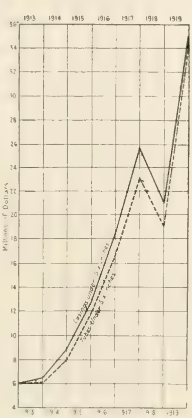
The Division also invites all of its members and other rubber chemists to submit results of their analyses of these materials to the Secretary of the Division so that these various analyses may be filed for reference of the members.

THE "TUF" INNER TUBE, IT IS CLAIMED, WILL NOT CRACK, CHECK, or craze, and will offer good resistance to heat and friction because "made just a little better than seems necessary." (Plexus Tire & Rubber Co., Tacony, Pennsylvania.)

Tire Production in the United States.

STATISTICS recently published by the National Automobile Chamber of Commerce, Inc., together with those gathered and prepared by THE INDIA RUBBER WORLD, show the complete resumption of the growth of the rubber tire industry following the check placed upon its normal development by the Government after the United States joined in the world war.

That the phenomenal growth of the American tire output is due chiefly to the enormous and steadily increasing use of the automobile for both business and pleasure in the United States is indicated by the motor vehicle registration for recent years and the fact that only about 2 per cent of the tire product is being exported. The United States consumes practically all the tires it makes.



PNEUMATIC TIRE AND TUBE PRODUCTION.

AMERICAN MOTOR VEHICLE REGISTRATION.

Year...	1913.	1914.	1915.	1916.	1917.	1918.	1919.
Cars...	1,254,971	1,711,339	2,445,664	3,512,996	4,983,340	6,146,617	7,565,446

Assuming five tires per car as the average annual consumption in 1913 and four and one-half tires per car the present consumption, owing to the wider use and longer life of cord tires, the American demand for tires has grown from about 6,275,000 in 1913, to over 34,000,000 in 1919, or nearly five and one-half times that of 1913.

AMERICAN TIRE AND TUBE PRODUCTION.

During the past seven years the American tire and tube production, actual and estimated, has been as follows:

Year	1913.	1914.	1915.	1916.	1917.	1918	1919.
Casings under 6 inches	*6,588,000	*8,983,000	*12,840,000	18,564,957	25,840,656	*21,000,000	*35,000,000
Tubes under 6 inches	....	....	....	16,785,398	23,256,752	*19,000,000	*34,500,000

*Estimated

It will be seen that the figures for 1917, the last year prior to government curtailment of tire production, show an increase to nearly four times the output for 1913. Although production in 1918 was curtailed to about 85 per cent of the 1917 output, the 1919 production showed an increase over 1917 of 23 per cent in casings and 48 per cent in tubes. At an average of $30 per tire the value of the 1919 product of casings under six inches was about $1,050,000,000, to which may be added $172,500,000 for the tube production at an average of $5 per tube, making a total of $1,222,500,000 for the pneumatic tire output of 1919, exclusive of giant cord tires for heavy trucks.

AMERICAN CRUDE RUBBER CONSUMPTION FOR TIRES.

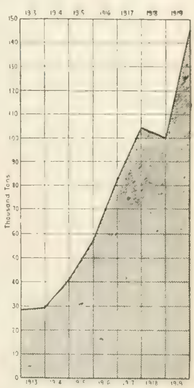
For the manufacture of the tires and tubes mentioned above the consumption of crude rubber was as follows:

	1917.	1918.*	1919.*
Casings under 6 inches.....*pounds*	162,643,482	150,000,000	225,000,000
Tubes under 6 inches	35,704,446	35,000,000	48,000,000
Solid tires	25,055,673	48,000,000	40,000,000
Other tires and sundries	9,983,195	15,000,000	12,000,000
Totals	233,386,796	248,000,000	325,000,000

*Estimated.

Only the estimated total weights are available for the years 1913-1916. They are in pounds: 1913, 65,880,000; 1914, 89,830,000; 1915, 128,400,000; 1916, 185,649,570.

In 1919 approximately 60 per cent of the india rubber consumed in the United States was used for tires and tire sundries as against 75 per cent in 1917 and only 58 per cent of the imports for the fiscal year 1913, indicating the greater supply of the raw material. The actual quantity of crude rubber used in 1919, however, was almost five times that for the year 1913, as against about three and one-half times that for the year 1917.



CRUDE RUBBER CONSUMED IN TIRES AND TUBES.

AMERICAN TIRE DEMAND FOR ORIGINAL EQUIPMENT.

Statistics of motor vehicle production in the United States indicate the increasing number of pneumatic and solid tires required annually for original equipment.

MOTOR VEHICLE PRODUCTION.

Year.	Passenger Cars.	Motor Trucks.	Totals
1913	461,500	23,500	485,000
1914	543,670	25,375	569,045
1915	818,618	74,000	892,618
1916	1,493,617	90,000	1,583,617
1917	1,740,792	128,157	1,868,947
1918	926,388	227,250	1,153,637
1919	1,657,652	316,364	1,974,016

Only a cursory inspection of these figures is necessary to see how the production of passenger cars and correspondingly of pneumatic tires under six inches was curtailed by the war situation of 1918, and the production of trucks and truck tires stimulated. Truck tire production for original equipment showed continuous growth during the war period. In 1918 it had increased to over 9½ times the 1913 production for this purpose and in 1919 to nearly 13½ times the 1913 production. Pneumatic tire production for the original equipment of passenger cars reached its highest figure for the year 1917, when it was more than 3¾ times the 1913 output. This volume of business was not quite reached in 1919, but the output for original equipment that year was more than 3½ times the 1913 production for this purpose. It is seen, therefore, that while 1,940,000 tires sufficed for new equipment in 1913, no less than 7,475,888 were required in 1917, and 7,896,064 in 1919, an increase to over four times the 1913 requirements. Although the greater volume of increase has been in pneumatic tires under 6 inches, the greater rate of increase has been in solid and large pneumatic tires for trucks.

TIRES IN USE IN THE UNITED STATES.

Of the 7,565,446 motor vehicles registered in the United States during the calendar year 1919, some 750,000 were trucks, so that about 8¾ times as many pneumatic tires under 6 inches as truck tires were in use last year, the number of each sort, exclusive of spares and replacements, being approximately 27,235,392 pneumatics under six inches and 3,000,000 truck tires. One additional tire per car would be a conservative estimate for spares and

replacements, making the totals, 34,044,240 pneumatics and 3,750,000 truck tires. With nearly 38,000,000 motor vehicle tires in use it is not surprising that some 25,000 vulcanizers are kept busy with repairs and retreading.

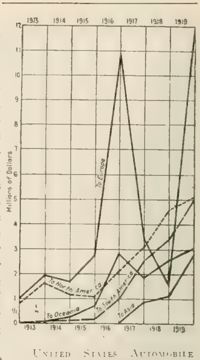
On the basis of 20 pounds of rubber average per car for regular equipment, and one-fourth of that extra for one spare per car, 170,221,200 pounds of rubber were being used last year in American tire casings under six inches alone, an amount almost equal to the total india rubber imports of the United States for the fiscal year ended June 30, 1915, and equal to nearly 32 per cent of the United States india rubber imports for the calendar year 1919.

UNITED STATES TIRE EXPORTS.

Export business has become a considerable part of the American motor tire business as shown by the following statistics compiled by the Bureau of Foreign and Domestic Commerce.

A study of these figures reveals several facts of interest, notably the remarkable growth of tire exports to South America, Asia, and Oceania. The combined value of the 1919 business in these three divisions was over 35 times the value of these exports in 1913. Exports to Oceania fell off in 1917, but the following year had nearly reached the high mark of 1916. The 1919 business exceeded the banner year 1916 by more than 8 per cent, showing an increase to more than 6 times the 1913 value.

Total tire exports to all countries likewise fell off in 1914, but gained in 1915, jumped during 1916 to about 4¾ times as much as in 1913, dropped considerably in 1917, but showed a noticeable gain in 1918 and a gain of about 55 per cent in 1919. Automobile tire exports for the calendar year 1919 amounted to more than double the value for the fiscal year 1917. It may be said, therefore, that despite the fluctuations of 1914 to 1917 inclusive, American automobile tire exports have shown a great and steady growth, the value of the foreign business in 1919 having increased to almost seven times what it was in 1913.



UNITED STATES AUTOMOBILE TIRE EXPORTS.

AUTOMOBILE TIRE EXPORTS.

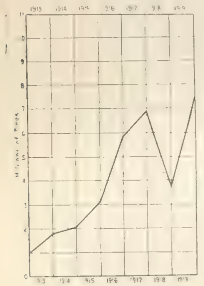
Exported to:	1913.*	1914.*	1915.*	1916.*	1917.*	1918.*	1919.†
Europe	$1,977,029	$1,764,240	$2,745,450	$10,992,184	$3,480,114	$1,460,518	$11,907,480
North America	1,626,155	1,254,200	1,187,632	2,184,874	3,186,265	4,474,713	5,188,317
South America	100,065	115,387	214,068	1,050,398	2,596,936	3,432,181	4,986,024
Asia	36,212	64,173	73,430	477,895	810,300	1,194,551	2,970,464
Oceania	185,807	279,327	702,877	2,396,401	1,832,244	2,662,422	3,177,431
Africa	17,952	27,940	39,813	334,475	424,342	753,286	694,943
Totals	$3,943,220	$3,505,267	$4,963,270	$17,936,227	$12,330,201	$13,977,671	$28,924,659

*Fiscal years.
†Calendar year.

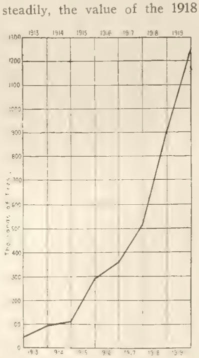
North American exports were adversely affected in 1914 and 1915, but thereafter steadily grew until in 1919 they had increased to over $5,000,000 in value.

The South American trade has maintained a continuous and remarkable growth throughout the seven years under consideration, the value of the 1919 exports being nearly 50 times that of 1913. Exports to Africa grew steadily until 1918, when their value reached some 42 times that of 1913, but showed a falling off of about 7¾ per cent for the calendar year 1919 as compared with the fiscal year 1918.

European exports have fluctuated greatly owing to the war. In 1914 they decreased a little, but increased considerably in 1915 and in 1916 jumped to more than five times their value in 1913, after which they declined steadily, the value of the 1918 shipments being only about 74 per cent of the 1913 value. The 1919 exports, however, exceeded the banner year 1916 by more than 8 per cent, showing an increase to more than 6 times the 1913 value.



PASSENGER-CAR TIRES FOR ORIGINAL EQUIPMENT.



TRUCK TIRES FOR ORIGINAL EQUIPMENT.

TWO NEW VULCANIZATION ACCELERATORS.

A vulcanization accelerator for which many advantages are claimed bears the trade name of "Vul-Ko-Cene." It has been demonstrated in practical work to be remarkably efficient. There is said to be more "kick" in one pound of vulkocene than in three pounds of any other accelerator and it is non-poisonous and prevents blooming.

A vulcanization accelerator of French manufacture is known as "Vulcazol." The makers claim that it is non-poisonous and requires no special precautions in its use. Only one-half to one per cent on the weight of the rubber is required and the time of vulcanization may be reduced from 80 to 85 per cent and a lower temperature be employed. It also prevents blooming by forming a stable combination with the excess of sulphur employed in the mixing.

ACCELERATORS UNDER LICENSE.

The right to use hexamethylene-tetramine, aldehyde ammonia, aldehyde derivatives and other chemical substances as promoters of vulcanization and improvers of vulcanized products, covered by United States patents Nos. 1,126,469 (January 26, 1915) and 1,149,580 (August 10, 1915), granted to Hoffman and Gottlob, is now controlled by the Grasselli Chemical Co., Cleveland, Ohio, to whom the patents have been assigned. The right to sell or use any of the substances coming within the scope of the patents in the manufacture of vulcanized rubber is said to be limited to their licenses.

"THE COMMERCIAL TYPE" FABRIC TIRE TO FIT 30 BY 3½ RIMS IS the most recent announcement of the production department of The Miller Rubber Co., Akron, Ohio. The new tire has been designed to take care of the added weight incident to commercial vehicles. In the past, it has been customary to use either a 30 by 3½ cord or a size larger fabric tire.

Methods for Physical Testing of Vulcanized Rubber Goods.[1]

SAMPLNG.

(1) Samples shall be taken directly from the finished material. These should be sealed, and marked with maker's name, date of sampling, kind of material and sufficient other data to insure easy and complete identification. The sample should be of such size as to permit of part being taken for test and the remainder stored for future reference, should the occasion arise. Every precaution must be taken to prevent contamination of the sample by any foreign material, and it must always be stored in a cool place. The object of these precautions is to insure that the sample shall be received in exactly the same condition as it was when taken from the original lot.

(2) In general, the following shall represent the amount of sample required for test:

(a) Tires, tubes, etc., of all kinds. One to be selected at random from each lot of 500 or less.

(b) Hose. Three lengths from each lot of 5,000 feet or less. A 3-foot section to be cut from each length selected, for bursting tests; other tests to be made on the remainder of the same sample.

(c) Belting. One sample 12 inches long from each roll of belting under 6 inches in width and 6 inches long from belting over 6 inches in width.

(d) Packing. One sample 10 inches long cut across the full width of the sheet from every lot of 250 pounds or less.

(e) Molded and lathe cut goods. One piece selected at random from every 200 pieces or less.

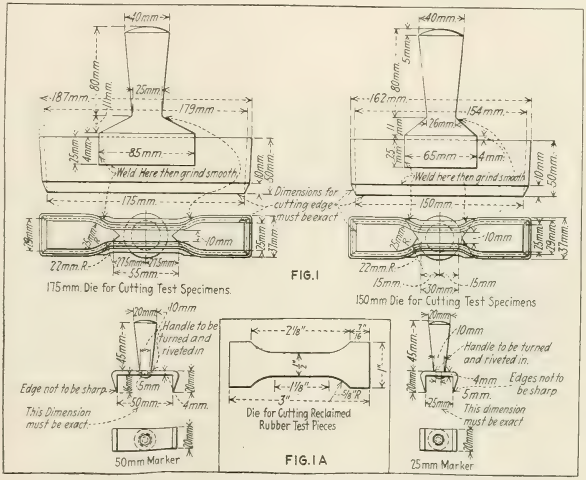


Fig. 1. Standard Dies for Cutting and Gaging Test Pieces. Fig. 1-A. Standard Die for Cutting Samples of Vulcanized Reclaimed Rubber.

PREPARATION OF TEST PIECES.

(1) For tensile, elongation and set, strips shall be cut 175 mm. long by 25 mm. wide by approximately 2 mm. thick. In every possible case these strips should be cut from the sample. In cases where the sample consists of a large block, as for instance, a section of a solid tire, the strips may be obtained by using heavy meat-slicing machine. When the material is made up with layers of fabric, as in the case of rubber hose, the first step in preparing specimens for the tension test is to separate the rubber from the fabric. Unless the frictioning is very poor, this will necessitate the use of a solvent. If there is more than one layer of fabric the easiest way is to remove the first layer along with the rubber. The rubber is then separated from the adjoining layer of fabric, using C. P. benzol blown from a wash-bottle. Narrow strips are more easily handled than larger pieces, and there is less danger of injuring the rubber. Great pains should be taken during this operation because any flaw or local imperfection will seriously vitiate the results. The rubber should be allowed to rest for four hours, in order that it may recover from the stretching it has received and that the benzol may thoroughly evaporate.

(2) Wherever possible test strips should be cut in the transverse direction. In case tests are desired in the longitudinal direction, they should also include the transverse. Directions should be recorded with the results of the tests.

(3) In case the articles to be tested will not permit of pieces as above taken, then small sample pieces shall accompany each lot. These may be cured in the form of sheets approximately 2 mm. thick and of such shape as to give the desired length and number of strips, provided further that they shall be guaranteed by the manufacturer to represent truly the average composition and cure of the article delivered. From the piece described above, test pieces shall be cut using for this purpose the standard dies shown in Fig. 1, except with samples of vulcanized reclaimed rubber for which the die Fig. 1-A shall be used. The cutting edge of the die shall be kept sharp and the test pieces may be cut best by striking the die a quick heavy stroke with a mallet, in which case the die should be provided with a handle, or it may be done by attaching the die to the rack of an arbor press, Fig. 2. The piece should be cut against a backing of fine cardboard, hard rubber or leather. The backing or cloth impression shall be removed from the test piece by buffing. Where test pieces are cut from strips of uneven thickness, they shall be buffed to a uniform thickness for about 8 cm. over the middle portion of the strips, after which the test pieces are cut with the die.

(4) For stocks having high elongation such as pure gum, a shorter die giving only 25 mm. constricted portion should be used.

[1] Report of Committee of the Rubber Division on Physical Testing. Published by courtesy of the American Chemical Society. Paper read before the Rubber Division of the American Chemical Society, at St. Louis, Missouri, April 14-15, 1920.

(5) Buffing: It is recommended that for buffing test pieces, the wheel shown in Fig. 3 be used. The wheel is operated with a ⅛-h.-p. motor. The rubber to be buffed is clamped to a carriage which is moved back and forth under the 5 by 1-inch emery wheel (No. 60) running at about 3,000 revolutions per minute. The central portion of the carriage just under the rubber is slightly raised, by which means it has been found that the operation is more easily performed and with less danger of injury to the rubber. The wheel has a vertical adjustment and a thumb-screw serves to lower the wheel by very small amounts as the buffing proceeds. Shields are provided for the purpose of keeping the fine particles of rubber off the guide. The starting base, though not necessary, is desirable in bringing the wheel gradually up to the maximum speed.

(6) Measuring Width and Thickness: A micrometer of the rack and pinion and dial micrometer type, Fig. 4, shall be used, using a known weight (225 grams), namely, just enough to actuate positively the rack and pinion and bring the disk positively on the face of the test piece without compressing the rubber. The shoe and base which presses against the rubber shall be 1 cm. in diameter.

(7) In case of asbestos packing, which is very stiff, it is necessary to use a greater weight to obtain the correct thickness: 3 kg. on the foot 1 cm. diameter should be used.

(8) Before any tests are made, the width and thickness shall be determined by taking several readings on the constricted portion of the specimen. The cross-sectional area shall then be determined on the basis of the readings which show the smallest cross section.

(9) Conditions for Making Tests: All tests of the rubber parts shall be made in a room the temperature of which is between 15 and 35 degrees C. The tests shall not be made until the test pieces have stood long enough to attain room temperature (not less than 4 hours). In case it should be impossible to perform the tests in room temperature within the limit of 15 degrees and 35 degrees C., a box or conditioning chamber is provided which can be kept uniformly at 24 degrees C., in which the pieces should be placed before testing, for a period of 4 hours, and the test performed immediately after removal from the chamber.

(10) Aging after Curing Before Testing: The slabs from which the strips are cut shall have been cured at least 24 hours before the test is made.

(11) Data on Reclaimed Rubber: The report of tests on vulcanized reclaimed rubber shall be accompanied by a statement in regard to the cure of the slabs from which the test pieces were cut; this statement shall include time and temperature of the curing heat and the amount of sulphur used.

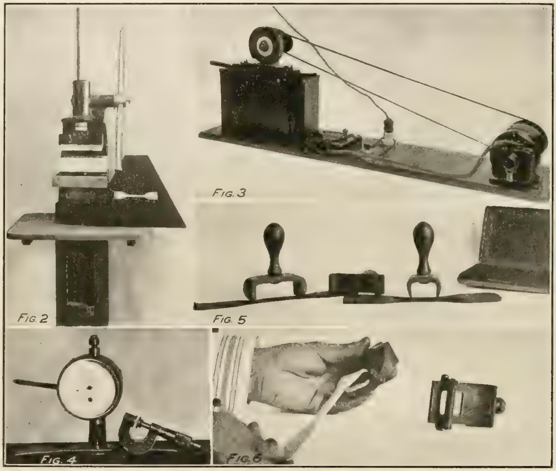


Fig. 2. Arbor Press for Cutting Test Pieces. Fig. 3. Buffing Wheel and Electric Drive. Fig. 4. Dial and Hand Micrometer. Fig. 5. Gage Marker (See Fig. 1 for Details of Construction). Fig. 6. Special Jaws for Pure Gum Tests.

PHYSICAL TESTS.

(1) Tensile: Tensile may be defined as the force required to break a piece of unit cross-section area. It should be expressed in kilograms per square centimeter.

(2) Elongation: This term is used to express the increase in the length of the test piece measured between two marks placed on that portion of the test piece which is of uniform cross section. It should be expressed in per cent.

(3) Set: This term is used to express the increase in the length of the test piece measured between two marks placed on that portion of the test piece which is of uniform cross section, after it has been stretched to 60 per cent of its breaking elongation for three successive times, holding it under this elongation for ten minutes each time, and permitting five-minute intervals of rest between each interval of stetch, and finally allowing it to rest ten minutes before the final measurement is taken. It is measured in per cent, based on the original length.

(4) Gage Marks: The gage marker, Fig. 5, shall be in the form of a stamp having thin steel blades which are strictly parallel and 50 mm. apart; another marker having blades 25 mm. apart shall be used for the high-grade stocks such as pure gum. The blades shall be kept clean and free from accumulation of ink, in order that the lines marked on the test pieces shall be very fine.

(5) Number of Tests: At least four strips shall be tested in every case and the average of these tests taken.

(6) Report of Results: Since the physical properties of rubber vary noticeably in any given product, it may occasionally happen that tests are made upon a test piece which will be of poor quality. The material as a whole meets the requirements of the standard, but the particular piece taken falls somewhat below it. To reject or accept a lot of, say, hose, belting, packing, etc., because of failure of just one test piece to meet the specifications, would, therefore be unfair. For this reason, acceptance or rejection of an item offered for delivery shall be based on the average of at least four determinations for each quantity. In arriving at these averages no weight shall be given to tests which are obviously in error, and do not represent true average conditions; namely, cases in which the tensile strength is low on account of a small flaw in the article. If the tensile strength of

a piece falls more than 10 per cent below the specified amount, it shall not be counted in calculating the average strength, providing that in no case shall more than 25 per cent of the pieces tested be eliminated on this account. In other words, the object of test is to determine the quality of the article as a whole.

(7) Adjusting Test Piece in Grips: The test piece shall be adjusted in the grips, care being taken to insure a uniform distribution of stress over its cross-section.

TESTING MACHINES.

(1) The testing machine shall be power driven and shall meet the following requirements:

(a) It shall indicate and record correctly the applied load, and its accuracy shall be tested from time to time by calibration with dead weights. The tension indicator shall not jump back more than 0.5 per cent when the specimen breaks. A machine for which the load is applied by tension on a spring should not be used.

(b) The grips shall separate at a uniform rate of 50 cm. per minute, except in the case of friction pulls where the rate of separation should be 25 mm. per minute, or for testing hard rubber the rate of separation should be 4 mm. per minute.

(c) The grips shall tighten automatically and exert a pressure proportionate to the applied tension. The grips shall exert a uniform pressure across the width of the test piece regardless of any variation in the thickness of the rubber. If the nature of the rubber is such that the jaws cut it in course of test, namely, pure gum inner tube stocks, a jaw such as shown in Fig. 6 is much more satisfactory.

(d) A device shall be provided for instantly starting and stopping the motion of the movable jaws; also means to enable the operator to return the movable jaws rapidly to their initial position.

(e) Computing results. Tensile, in kilograms per square centimeter equals

$$\frac{B}{W \times T} \times 100$$

B = Tension in kilograms indicated by machine at breaking point.

W = Width of test piece measured to 0.01-mm.

T = Thickness of test piece measured to 0.01-mm.

In other words, the tensile in Kg/cm² is obtained by dividing the breaking load expressed in kilograms by the cross section area of the test piece expressed in square centimeters.

(2) Elongation: The ultimate elongation should be measused with a steel tape graduated to millimeters, attached to trammel points fixed on a rod running parallel with the test piece and so arranged that they slide on this rod (Fig. 7). The trammel points are then always kept even with the marks on the test piece and after the piece has broken, the scale will record the distance between the marks at the time of breaking. If the initial distance between the marks is 50 mm. and the distance between the marks at the breaking point is 150 mm. the per cent elongation will be 150 mm. minus 50 mm., divided by 50 mm. multiplied by 100 equals 200 per cent. Or it may be expressed by

$$\frac{Lf - Lo}{Lo} = 100 = \text{Per cent elongation.}$$

Where Lo equals initial distance between the marks, Lf equals distance between the marks at the breaking point.

(3) Set: For determining the set, the apparatus shown in Fig. 8 shall be used. The test specimens shall be prepared the same as the pieces used for tensile and ultimate elongation tests. Its operation is as follows: The specimens being in the grips, one of the spools is moved along the shaft until it engages the corresponding pin, and the shaft is revolved until the specimen has been stretched to 60 per cent of the breaking elongation measured between gage marks. The clamp is tightened to hold the specimen in this position for 10 minutes. The specimen is then released and allowed to rest under no elongation for five minutes. It is then stretched to 60 per cent as before and held 10 minutes again, then released and allowed to rest another five minutes. Again stretched to 60 per cent as at first, and held a third 10-minute period, after which it is released and after being allowed to rest five minutes, the final measurement of the distance between the two marks is made. The initial distance be-

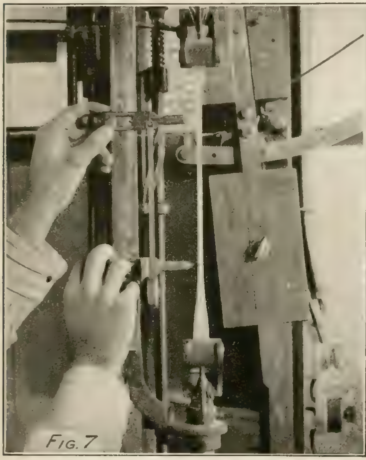


Fig. 7. Device for Measuring Ultimate Elongation.

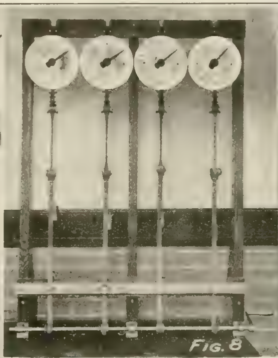


Fig 8. Apparatus for Determining the Set.

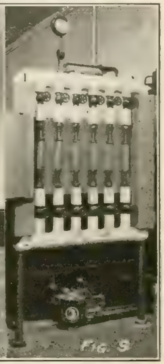


Fig. 9. Pipe Connections for Steam Hose Test.

tween the two marks subtracted from the final distance gives the increase in length or the set and this distance divided by the original length multiplied by 100, expresses the set in percent of the original distance. For example, if the original length is 50 mm., and the final length is 57.5 mm., the set in per cent will be 57.5 minus 50 mm., divided by 50, and multiplied by 100, equals 15 per cent.

(4) Taking of Time: All measurements of time shall be by means of a stop-watch or with a watch having a second hand. The fundamental methods of testing are so made throughout the entire rubber specifications that the following procedure shall be uniform. After placing any test piece in the machine ready for stretching, the piece shall be drawn just taut and the stop-watch started at the instant of the beginning of the stretch.

Then in case a piece is held for 10 minutes at a certain distance, the time shall be again measured at the moment the piece is released. This moment is simultaneously the beginning of the period of rest. The measurement is then to be taken at the instant of the expiration of the second 10 minutes.

(5) When the specification calls for a 1-minute stretch and a 1-minute rest, the time consumed in stretching to the specified elongation shall not exceed 15 seconds.

(6) Initial Tension and Reduction in Tension after a Specified Elongation for a Given Length of Time: For this purpose

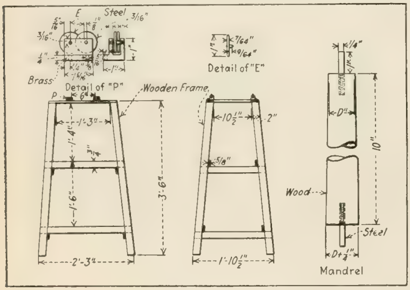


Fig. 10. Apparatus for Testing Frictions.

the apparatus illustrated in Fig. 8 may be used. Its operation is similar to that of the apparatus shown in Fig. 7. If desired a spring balance may be used in connection with the apparatus shown in Fig. 7.

(7) Friction Adhesion: Definition of Friction: By friction test, is meant the strength of the adhesion of the fabric plies that will meet the test given in the various specifications for adhesion between the fabric plies or between fabric and cover.

(8) Method of Making the Test: A section a little over 25 mm. in width should be cut and raveled down to exactly 25 mm. After starting the separation as previously described under "Preparation of Test Pieces," the ends of the pieces are gripped in the jaw of the testing machine after which separation is affected by running the machine so that the jaws separate at a uniform rate of 25 mm. per minute. The weakest point shall be recorded and the average taken.

(9) In the case of tire frictions and hose frictions it is usually desirable to make a separation between every ply; with belts the usual practice is to make a separation of two plies at a time.

(10) Apparatus and General Method of Conducting Dead Weight Tests.

Friction: A testing frame, Fig. 10, suitable for the purpose shall be used. This may consist of a wooden frame provided with roller bearings at the top in which a mandrel is free to revolve. The total weight including the clamp suspended from the test piece, shall be equal to that called for in the specifications.

(11) A movable platform should be provided for supporting the weight while adjustments for the tests are being made. The arrangement should be such that the platform may be gradually lowered until the weight is carried by the test piece, after which it should be dropped or swung to the side. In every case this operation should be accomplished without a jerk. With the weight hanging freely from the test piece a mark shall be made along the line of separation of the layers, and at the same instant the time shall be noted for the beginning of the test. At the end of 10 minutes, or as great a part thereof as possible, a second mark shall be made along the line of separation. The distance between the marks, measured after the weight has been removed, shall be used in computing the rate of separation.

(12) Plied Hose: In preparing test pieces, a short length of hose is pressed tightly over a slightly tapered mandrel. The mandrel is put in a lathe and 25-mm. rings are cut with a pointed knife. Beginning at the lap a short length of the fabric is separated and the ring is pressed snugly over a mandrel which is placed in the roller bearings on the test table. To the detached end of the fabric is fastened a clamp provided with a hook or ring from which the weight is to be supported.

(13) Cotton Rubber-Lined Hose: In preparing a sample of cotton rubber-lined hose, a 5-cm. section shall be taken and cut at the lap to give a strip equal in length to the circumference of the hose. From this section a 40-mm. strip shall be cut with as little injury as possible to the cotton jacket. The jacket shall be separated from the lining for about 40 mm. at one end. The detached end of the jacket is held in a stationary clamp which is supported by the testing frame and the specified weight is suspended from the rubber lining.

(14) Rubber Belting: When testing rubber belting, a 25-mm. strip cut either longitudinally or transversely, shall be used. The strip shall consist of two plies of fabric only, these plies to be the second and third plies of the belt, numbering from the top cover or from the bottom cover, as may be desired.

(15) Packing and Gasket Material: When testing packing or gasket material, the pieces shall be prepared and tested as in the case of cotton rubber-lined hose, unless the thickness of rubber is greater than 27 mm. under which conditions the piece shall be prepared in such a way that the rubber part is to be clamped at the top and held immovable while the weight is to be clamped to the fabric. The test strips shall be cut in both directions.

(16) Tuck's Packing: The friction in round Tuck's packing shall be tested by the same method as is used in plied hose, the core being drilled out to permit the insertion of a mandrel. Whenever the core is 5 mm. or less in diameter it shall be tested in its original shape. When it is over 5 mm. in diameter a piece 15 cm. long shall be separated from the fabric and cut and buffed on four opposite sides to form a square section 2 mm. by 2 mm. in the center of the test piece. The 2-mm. square shall be at least 25 mm. in length.

(17) Hydraulic Pressure Test of Rubber Hose: The hose shall be stretched out for inspection, connected to the pump, and filled with water, leaving the air cock open to allow the air to escape. The air cock shall then be closed with a pressure of 1 kilogram per square centimeter applied. The test is then begun by taking original measurements without releasing the pressure.

(18) All pressure measurements shall be made with a standardized gage. The increase in pressure shall be at the rate of 715 kilograms per square centimeter per minute and the hose under test shall be held for measurement not more than two minutes, unless otherwise called for in the specifications. The hose under test should be protected by a frame of metal or wood, or of heavy plate glass so that in case a piece breaks during the test the operator will not be injured.

(19) Steam Test for Rubber Hose: The arrangement of pipe connections shown in Fig. 9 is recommended. The header (1)

is provided with 6 outlets connected with a steam trap (3) that is provided with inlets and controlling valves. The hose to be tested is cut into lengths that will just fit between the connections on the headers, the bottom connections being made with unions. Steam at specified pressure passes into the header (1) and thence through the hose to the header (2) from which the condensation is carried to the steam trap. The hose under test should be protected by a frame of metal or wood or of heavy plate glass so that in case a piece breaks during the test, the operator will not be injured.

Notes on Accelerators.

By Henry P. Stevens, M.A., Ph.D., F.I.C.

Although the mineral accelerators such as magnesia and litharge have been used for many years, the term accelerator was seldom heard until the introduction of the organic accelerators or vulcanizing catalysts. As the latter term implied, these substances are believed to owe their efficiency to their catalytic effect as intermediary in the reaction between the caoutchouc molecule and the sulphur. This view is rather supported by the recent discovery of Peachey that vulcanization is effected by allowing sulphur dioxide and hydrogen sulphide gases to react in the presence of the rubber. The reaction takes place spontaneously at room temperature, showing the greatly increased reactivity of sulphur in the nascent (atonic?) state. Catalysts are supposed by some to owe their efficiency to the formation of intermediate products. In the case of accelerators, the intermediate product would be formed with the sulphur, which would then decompose, liberating the sulphur again and reforming the accelerator. The liberated sulphur would not be in the ordinary molecular state at the moment of liberation and might therefore be more reactive as in the case of the nascent sulphur liberated by the reaction between sulphur dioxide and hydrogen sulphide. It does not follow, however, that when an element is liberated in the course of a chemical reaction it is necessarily in a more reactive form. Sulphur liberated by reactions other than that described does not appear to vulcanize rubber. In such cases, either the element is not particularly reactive at the moment of liberation or the conditions are such that ordinary molecular sulphur is formed before the active form has had an opportunity to react with the caoutchouc or rubber present. It may be necessary that the catalyst should be in intimate contact (to use crude expression) with the caoutchouc molecules or aggregates. In Peachey's reaction we have a gas (sulphur dioxide) which is soluble in rubber to an appreciable extent. We may assume that the gas is in intimate contact with the caoutchouc aggregates, possibly adsorbed on the particles of which the colloid is composed. Under these circumstances vulcanization takes place when the sulphur is liberated and is so far complete that an ordinary degree of vulcanization can be obtained with hardly any free sulphur produced, that is to say, practically the whole of the sulphur reacts with the rubber at the moment it is liberated.

The organic accelerators are substances which easily mix with rubber, in fact they are probably soluble to a certain extent in raw rubber and consequently fulfil the above suggested condition of intimate contact in the event of their combining with sulphur and consequently liberating this sulphur in a more reactive form. If this theory is correct the liberation of the sulphur and consequent vulcanization of the rubber may be regarded as taking place instantaneously. On the other hand the formation of the intermediate substance by combination between accelerator and molecular sulphur may take an appreciable time period. If this be so the efficiency of an accelerator will primarily depend on the rate of reaction between it and molecular sulphur, provided that the substance formed can be dissolved or adsorbed to a sufficient extent by the caoutchouc with which it reacts. The reaction between the accelerator and the sulphur has been discussed by Bedford and Scott (The India Rubber World, January, 1920, page 207), who show that the efficiency of some accelerators is probably dependent upon the intermediate formation of thiourea derivatives as they react with sulphur at vulcanization temperatures. Similarly it has been suggested that the efficiency of isnitroso dimethyl aniline depends on its reduction and the formation of an amino derivative which actually functions as the accelerator. This, however, is not supported by the relative accelerating power of para nitroso phenol and para amido phenol. The former is an accelerator, the latter has no appreciable accelerating effect. In some cases it may be that the intermediate product is not so readily formed and requires a temperature higher than the ordinary vulcanizing temperature if it is to be produced in appreciable quantity. At any rate it is claimed that distinct advantages result from the use of the reaction product of the accelerator and sulphur over a mixture of the two. As examples, methylene-aniline and methylene-diphenyl diamine have been quoted. (British patent No. 130,857. The India Rubber World, November 1, 1919, page 80.) The main curing effect produced has been ascribed to the formation of their carbanilides. It is obvious that the action of accelerators may in many instances be very complicated and there is a large field open for investigation. My own work carried out years ago (1911 and 1912) showed that without a nitrogenous constituent rubber could hardly be got to vulcanize at all. Nature fortunately provided the rubber manufacturer not only with the raw material but also with the catalyzer necessary to effect vulcanization.

The action of inorganic accelerators differs in some respects from the organic accelerators. It is commonly stated that the latter are more efficient and this impression arises from the relatively small quantity of inorganic accelerators employed in rubber compounding, quantities such as ½ to 1 per cent on the weight of the rubber being commonly employed. It is obvious, however, that larger quantities would detract from the physical properties of the rubber, for, apart from their accelerating value, they are merely compounding ingredients without strength or elasticity. Moreover, the price would restrict the quantity employed. On the other hand, some of the mineral accelerators are generally regarded as exerting a beneficial effect apart from their accelerating action. The magnesias, carbonate and calcined, are examples. Large quantities of the light carbonate are used for the apparent toughening effect produced, apart from the small accelerating action which this mineral possesses. The calcined magnesia has very considerable accelerating power and is comparable with many efficient organic accelerators, particularly when used in quite small amounts—up to say ½ per cent. Kratz and Flower are of opinion that its accelerating power is only indirect. That is to say, it does not accelerate vulcanization by direct action on the rubber but merely liberates and renders more active the nitrogenous accelerator present in the rubber. Some of the organic accelerators are extraordinarily efficient—for example, dimethyl-ammonium-dimethyl-dithiocarbamate (the addition product of dimethylamine and carbon bisulphide), which, according to Cranor, is rendered still more active in a rubber mix containing a small quantity of zinc oxide. One-half per cent of this accelerator enables satisfactory vulcanization to be effected in three or four minutes instead of 50 minutes. It was also found that spontaneous vulcanization of this stock takes place in the cold and the compound is very fairly vulcanized after one to two months'

storage at room temperature. The effect of zinc oxide in activating organic accelerators is not in the least understood. Twiss, in a recent paper, gave figures for some other organic accelerators which are similarly activated by a small quantity of zinc oxide; in fact without zinc oxide many of them would be of little use.

We have considered the accelerating effect—that is to say, the catalytic action—of these substances in promoting the union of caoutchouc and sulphur, but it is also of interest to compare the physical properties of rubber vulcanized with and without an accelerator. For this purpose we make use of the coefficient or percentage of combined sulphur calculated on the raw rubber as the basis on which to compare the physical properties; in other words, we determine the breaking strain and elongation of the specimens vulcanized to give the same cœfficient. Gottlob noticed some time ago that there was considerable danger of overcuring—that is to say, formation of an unstable vulcanizate—if rubber containing an organic accelerator was fully vulcanized. In a series of cures it was found that without the accelerator the breaking strain of the overcured specimens showed a gradual reduction with the excess curing, while in the presence of an accelerator the decrease in tensile strength was very sudden. He did not, however, publish any aging tests in confirmation. The writer and others have shown that a pure rubber mix is best cured to give a cœfficient of approximately 3, if tensile figures are considered in conjunction with aging tests. When, however, accelerators are added, it appears from Cranor's figures that the coefficient should be much lower if satisfactory aging results are to be obtained. When using powerful catalysts with a small proportion of zinc oxide it is probable that the rubber is sufficiently vulcanized when the coefficient amounts to one unit. The higher tensile figures obtainable by the use of organic catalysts appear, therefore, to some extent illusory. Some recent figures of Seidl are worth quoting in this connection. He made up four "mixings" and vulcanized for varying periods at 138 degrees C. The results in the accompanying table show the physical properties and time of cure for six fixed percentages of combined sulphur (*"Gummi-Zeitung,"* June 18, 1920, pages 797-8). The physical tests were made on rings of 4 square millimeters cross-sectional area, and I have recalculated the breaking strain to grams per square millimeter cross-sectional area.

the same breaking strain as that without accelerator having a coefficient of 2.47. Consequently to obtain a breaking strain of 590 grams per square millimeter a rubber and sulphur mixing must be vulcanized to double the coefficient which would be necessary if a suitable accelerator were added. To yield a breaking strain of 1,160 to 1,170 the use of a mix without accelerator will necessitate vulcanizing to give a 50 per cent higher coefficient. For a breaking strain of 1,540 to 1,590 the coefficient must be raised 30 per cent. With breaking strains over 2,000 the coefficient does not require to be raised and is practically the same for both mixes. We therefore have a progressive relationship. The difference in the coefficient required to produce the same breaking strain being less and less the higher the coefficient. With 1 per cent of the accelerator used by Seidl, the rubber would appear to be fully cured round about a coefficient of 2 to 2.5 against the figure of 1 suggested by Cranor for the very efficient accelerator which has been used in his experiments.

A comparison of columns 3 and 4 is also of great interest. The compounds used differ only in the percentage of sulphur. It has been stated that approximate proportional vulcanization exists between the coefficients and added quantities of sulphur in ordinary rubber sulphur mixings. The figures show that a similar condition holds for accelerator compounded mixings. The time required to produce the same sulphur coefficient is approximately two-thirds, in the case of the 15 per cent sulphur mix, of what it is in the 10 per cent sulphur mix. It is said that rubber can dissolve only a limited amount of sulphur—about 10 per cent and, therefore, larger quantities merely act as a diluent and tend to hinder rather than promote the reaction. As caoutchouc sulphide is formed, larger quantities of sulphur can be dissolved, as caoutchouc sulphide is a better solvent for sulphur than raw rubber. (Compare work of Skellon, also "Communications of the Netherland Government Institute for Advising the Rubber Trade and the Rubber Industry," 1916, page 239 *et seq.*) Consequently, as vulcanization proceeds, a larger proportion of sulphur is dissolved (if available) and an increase in rate of cure results. One would not expect such an increase until an appreciable proportion of sulphur had combined with the rubber. If we compare the third and fourth columns it will

Combined Sulphur Per Cent.	(1) 100 parts rubber. 10 parts sulphur.			(2) 100 parts rubber. 5 parts sulphur 1 part accelerator.			(3) 100 parts rubber. 10 parts sulphur. 1 part accelerator.			(4) 100 parts rubber. 15 parts sulphur. 1 part accelerator.		
	Breaking Strain. Grams.	Stretch. Per Cent.	Time of Cure. Min.	Breaking Strain. Grams.	Stretch. Per Cent.	Time of Cure. Min.	Breaking Strain. Grams.	Stretch. Per Cent.	Time of Cure. Min.	Breaking Strain. Grams.	Stretch. Per Cent.	Time of Cure. Min.
0.82	90	875	50	450	1,030	8	590	...	7½	1,280	875	5
1.63	590	927	140	990	969	24	1,170	919	15	1,900	841	12½
2.47	1,160	936	210	1,290	945	40	1,590	892	27	2,050	805	17½
3.21	1,540	895	288	1,570	932	58	1,780	852	40	2,250	773	22½
3.90	2,080	837	335	...	...	..	2,080	823	42	2,870	740	35
4.51	2,440	805	382	...	...	..	2,320	318	56	3,250	745	40

PHYSICAL PROPERTIES AND TIME OF CURE FOR SIX FIXED PERCENTAGES OF COMBINED SULPHUR.

To study this table we may concentrate on the first and third series of figures. The compounds differ only in that (3) contains 1 per cent of accelerator. This reduces the time of cure to about one-seventh or less. It will be noted that the sulphur is present in considerable excess even when the maximum amount (4.57 per cent) is combined. If the breaking strains are compared it will be seen that the addition of the accelerator produces a very considerable increase of breaking strain at the lower cures, that is, up to about 3 per cent of combined sulphur. For 3.9 and 4.5 per cent of combined sulphur the breaking strains are practically the same for both mixings. At this stage both are overcured. The difference in breaking strain is therefore confined to normal cures. The breaking strain of the accelerator compounded rubber with a coefficient .82 is approximately equal to that without accelerator having a coefficient of 1.63. Similarly the accelerator compounded rubber with a coefficient of 1.63 gives approximately

be seen that a considerable increase in rate of cure results from increasing the proportion of sulphur from 10 to 15 per cent. The time of cure is reduced from 7½ to 5 minutes and proportionately. At the same time the breaking strain is more than doubled. In fact with 15 per cent of sulphur the rubber appears fully cured with a coefficient but little exceeding one unit. If this is so, the coefficient corresponding to the correct cure will depend not only on the nature and proportion of accelerator but also on the proportion of sulphur added. It is not possible to speak positively until aging experiments have been carried out. In this connection I would much prefer tests made at about normal temperature, say not above 30 degrees C., rather than so-called accelerating aging tests at higher temperatures. Temperature is not the only factor in aging and it is doubtful whether it is safe to assume that the accelerated aging tests will give results comparable with those carried out at room temperatures.

The Manufacture of Battery Jars.

In 1919 there were in round numbers 7,000,000 passenger cars in use in the United States. If one-half of this number were equipped with lighting and starting batteries that cost $40 each, the outlay would be $140,000,000 for batteries. The estimated number of starting and lighting batteries now in use is 5,253,073, valued at $236,388,285. Allowing three jars to a battery, 15,759,219 hard rubber jars, valued at $20,000,000, would be required.

It is estimated that there are 100,000 electric vehicles in the United States, of which 50,000 are passenger and 50,000 are commercial. The cost of the average battery is about $600 for a passenger car and $1,000 for a commercial car; a total expenditure of $30,000,000 for passenger and $50,000,000 for commercial cars. The average number of cells is 32 in a passenger car and 44 in a commercial, or a total of 3,800,000 jars. The average cost of a jar is about $2, therefore the total expenditure for hard rubber jars for electric vehicles will be $7,800,000.

There are other uses for storage batteries, such as supplying light and for power and ignition purposes in a great variety of applications. No substitute has been found as yet that will replace hard rubber for battery jars.

Battery jars are made mostly on white metal forms constituted of lead, tin and antimony. These forms are easily made and with very little machining. White metal is used in preference to cast iron although cast iron is more durable. The reason for this is that there are so many changes of sizes made by customers and a variation of shrinkage allowances due to the different kinds of raw material used, that it is easier to melt and cast a core over than it is to machine it.

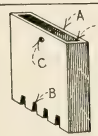


FIG. 1

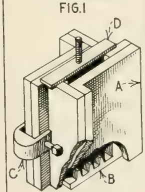


FIG. 2

The core is shaped as shown in Fig. 1. The walls A are about ⅜-inch thick and the grooves B vary in number from two to as many as the customer specifies. At the bottom of the groove B two or more small holes are drilled into the air chamber D so that the ribs of the jar can be cured more easily, and then two larger holes are drilled in the sides as shown at C. This is done so that when the air expands in chamber D, while curing, it will have a chance to escape and when the jar is being pulled from the core, it allows an inlet of air so that no vacuum is created between the jar and the core, thus making it easier to remove the jar. These holes can also be used with a mechanical device to remove the battery jars from the forms after curing.

The molds used are of a collapsible type as shown in Fig. 2. Various sizes of angle-irons A are made to agree with the various sizes of jars being made. The base B acts as a gage to set up the angle-irons A and forms the rib places in the core. The angle-irons A are then clamped with special clamps C, four of which are used and then D is inserted to act as a core for the air chamber. This core is slightly tapered on the sides to draw easily when removing it from the mold. The core and angle-irons should be heated up to very near the temperature of molten metal. This can be done by immersing them in a pot of molten metal. As white metal has a greater specific gravity than iron, the iron parts will float. These parts will, therefore, take up enough temperature so as not to allow the molten metal to chill too quickly when pouring and will then give the surface of the form a very smooth finish. The metal is then poured in this form and a long wire rod is pushed in and out in the molten metal to remove any trapped air that would cause air holes in the cores.

The angle-irons A should be made very accurately and of sufficient strength so that they will not warp because of constant heating and changing of temperature.

A great deal of tin-foil about .005-inch thick is used throughout the manufacture of articles made from hard rubber, and the making of battery jars is no exception to this rule. It helps to handle the sheet rubber and is an asset in the vulcanization. It also gives the outside surface a polished effect. At one time the specifications for battery jars stipulated this surface condition but now it is not required. Before putting the jars in series into containers, the acid sometimes splashed and frequently ran over the sides, and if the jar was perfectly smooth the acid would run off, but if the sides were rough as they are when the jar is not made with tin-foil, the drops of acid would adhere to the sides and make a rather unsightly appearance.

After the stock is compounded it goes through a process illustrated in Fig. 3. The stock is first warmed in a mill shown at A and the operator then feeds the stock to the calender B. To keep the thickness of rubber more uniform and to eliminate all air pockets, the stock is plied, two or more plies, depending on the thickness required, on a large drum shown at C. This drum runs at the same speed as the calender B and is approximately 3 feet 6 inches in diameter and is water-cooled. The calender man applies a sheet of tin-foil to the drum C and the rubber sheet is plied on this tin-foil. Another man handles a hand operated conveyor shown at D and cuts the stock from the large drum in two pieces and lays it on a tray. The width of stock run from the calender is the correct length for wrapping around the core for making jars. It requires three men to operate these machines.

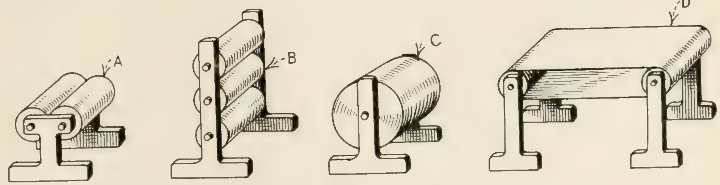


FIG. 3

The next step is to cut these sheets to correct widths for the jars, allowing a surplus for trimming top and bottom. This is done by laying the stock on a flat, smooth table, marking with a

piece of chalk and then cutting to size with a knife. When tin-foil is used these sheets can be stacked but when it is not used, trays or books with several sheets of holland must be used.

A gang of six men work at a table shown in Fig. 4, with wooden tops A and a steam-table B which carries approximately eighty pounds' pressure. These men make up the jars and remove them from the cores after they are cured. For this work they get from five dollars to eleven dollars per 100 jars, depending on the make and size. One of these men is called the leader and is directly responsible for the men and for defective jars made by his gang. The steam-table is used to warm up the cores and stock. When the core is warm, it gets a coat of silicate of soda which dries very quickly. This solution prevents the finished jar from sticking to the core and facilitates its removal from the core.

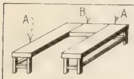


FIG. 4

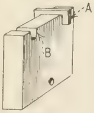


FIG. 5

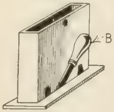


FIG. 6

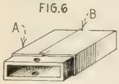


FIG. 7

The ribs are then assembled in the core cavities as indicated in Fig. 5. They are inserted (See A) and pressed down with the knife handle used for trimming; the trimmed rib is shown at B. These ribs are made from a dry stock, mostly hard rubber dust and shoddy, and soap-stoned so that they will not stick to the core. After the ribs are trimmed, the bottom and ribs are coated with cement and placed on a piece of rubber which forms the bottom of the jar. The core is then turned over as shown in Fig. 6 and the rubber is trimmed with the knife B using the core as a guide. The sides are then cemented so that the rubber will stick to the core.

The sides are next wrapped as shown in Fig. 7 and the rubber sheet A trimmed at B. By pressing the knife handle along the edge B the impression shows where the stock meets. Using this impression as a guide, the surplus stock is trimmed off and the sides are then rolled down to press out any trapped air between the core and walls. This is done with a steel rolling pin, weighing about fifteen to twenty pounds.

The top is next trimmed as shown in Fig. 8, using knife B and a wooden block A, which is the correct height. A hard rubber block as shown at C is then inserted, the thickness of which allows enough rubber to be turned over on the bottom after trimming with the knife D. The edges are then turned in as shown in Fig. 9, working from both ends, first at A and then B, when the reinforcing strips are assembled as shown in Fig. 10 at A.

The identification of the customer and the gang number are then stamped on the jars which are stacked on small heater trucks, care being taken that they do not touch each other, and they are vulcanized from four to four and one-half hours at approximately fifty-five pounds pressure.

Some manufacturers have designed and built machines for wrapping battery jars mechanically, but these machines, although doing a better job than the hand method, do not materially increase production over the manual method.

After removing the jars from the heaters, the tin-foil is immediately removed because if it is left on, the jars take a brownish color. After cooling in the air between five and ten minutes, the jars are partly stripped from the cores. This is so that the jars will not warp or shrink by giving them time to set. If battery jars become set on the cores it is very difficult to remove them without frequent breakage and damage to the core. There are several methods of removing jars from cores and some are by rather ingenious mechanical devices. The simplest is a hand method in which a tool similar to ice tongs is used, only that instead of sharp points on the ends, they have two parallel bars. With this method fewer jars are broken in removing them.

After fifteen minutes the jars are completely removed from the cores and piled neatly on the floor until they are completely cooled. The bottom and top of the jars are then ground to a finished dimension as specified by customers. This is done on either disk or belt grinders. The belt grinders are used mostly for smoothing up the jar seams. The bottom is ground first and held to a close limit in relation to the inside ribs. These ribs are important as they hold up the positive and negative plates with the separators, and the sediment created by the acid drops to the bottom, thereby eliminating short circuiting of the battery. The tops are then ground square with bottom and the seams touched up on a belt grinder, when the jars are ready for the electrical test.

Battery jars are given an electrical test of 18,000 to 30,000 volts as specified by the customer. At one time a water test was made by sealing up the jar and putting it under approximately 4 pounds' pressure. This test has long been disregarded. The following elongation and tensile strength test and standard test piece was adopted August 27, 1918, by the Hard Rubber Division of the War Service Committee:

ELONGATION AND TENSILE STRENGTH.

The elongation is to be based on a 3-inch measured test section. Measurement must be made before test sample is put into the testing machine. Either dividers or extensometers applied to the test piece at the ends of the measured length may be used to measure elongation. The dividers or extensometers used in measuring the elongation must be free from, and independent of, the testing machine or any movement of the heads.

The tension test is to be made in a Tinius Olsen, or similar testing machine of suitable capacity. The rate of speed of the separation of jaws shall be uniform and shall be between 1/10-inch and 2/10-inch per minute. The test pieces before breaking shall be immersed in water for one hour at a temperature of 70 degrees F. Battery jar test pieces are to be broken in testing machine room temperature of between 70 and 80 degrees.

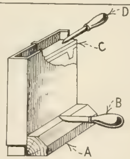


FIG. 8

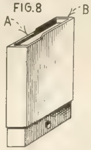


FIG. 9

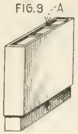


FIG. 10

CLAIMS FOR REHEARING.

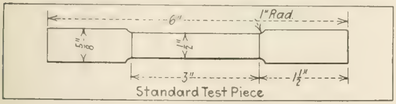
Rejected material and samples of it will be held for one month from date of test report. Accordingly, in case of dissatisfaction with the result of test, the shippers must make claims for rehearing, should they desire it, within that time. Upon application for rehearing, the shipper may send a representative who may sort the rejected jars, accept as rejected such jars as he desires, and submit for further test the balance claimed within the specification. Such balance shall be tested in the presence of the shipper's representative, the samples being paid for by the shipper.

For such retest five jars shall be selected at random from each thousand, or from each lot, and should the average of test meet the specifications, the lot tested shall be accepted. This does not apply to individual rejections.

After passing the various tests the jars are ready for shipment.

REPAIRING DEFECTIVE JARS.

Some jars that are defective or those that are rejected can be repaired very easily. If a jar does not stand up to the electrical test, a hole is burned in it. This is caused by some minute particle of dust or metal. The jar can be repaired by filling up



the hole with gutta percha and revulcanizing with a small electric vulcanizer. If the jar is warped or under size, it can be straightened and stretched by placing it on the steam-table until it is soft, when it is straightened by forcing it gradually over the core on which it was made.

PROPOSED TENTATIVE METHODS FOR TESTING TEXTILES.[1]

TYPE OF MACHINE.

1. TEXTILE TESTING MACHINES shall be of the inclination balance or pendulum type.

TESTING MACHINE CAPACITY.

2. In selecting the proper capacity of testing machine for a given fabric, the maximum capacity of the machine shall conform to the following:

Breaking Strength of Fabric, Pounds.	Maximum Machine Capacity, Pounds.
0—25	50
10—50	100
20—100	150
50—200	300
50—300	400
250—650	800

ANGLE OF PENDULUM.

3. The maximum angle of swing of the pendulum shall be 40 degrees from the vertical.

RATE OF LOADING.

4. The rate of loading in textile testing machines shall be 250 pounds per 1 inch of traverse of the head jaw.

TYPE OF JAW.

5. The jaws in textile testing machines shall be of the flat anvil type, both anvils being free to swing on a horizontal axis. The anvil faces shall be smooth and no friction cloth shall be used. The anvils shall be closed at a uniform and invariable pressure by means of an eccentric and lever.

CRIMP.

6. Crimp shall be defined as the difference in distance between any two points on a yarn in a fabric and the same two points after the yarn has been removed and straightened. This difference shall be reduced to percentage of the yarn length as it lies in the fabric.

OFF-SQUARE.

7. The percentage of warp crimp minus the percentage of filling crimp shall be defined as the off-square of the fabric.

METHOD OF DETERMINING CRIMP IN TIRE FABRIC.

8. Threads for crimp test shall be taken from the inside edge of test piece as near the center line of the roll as possible. Threads for crimp test shall be laid out by marking across them in the fabric parallel lines not less than 6 inches apart. An even number of threads not less than four in number shall be taken for each warp and each filling test. These threads shall be raveled from the fabric after marking, allowing about 2 inches extra on each end of the threads beyond the marks. The threads shall then be straightened by a machine which applies a constant load of 75 grams and the length between the original markings shall then be read in terms of the yarn length as it lay in the fabric. The machine shall be equipped with a dial or scale so arranged as to read the percentage crimp directly.

[1]Published by courtesy of the American Society for Testing Materials. Report of Committee D-13, read at the annual meeting of the Society at Asbury Park, New Jersey, June 22-24, 1920.

THE INTERNATIONAL CHAMBER OF COMMERCE.

The first meeting of the International Chamber of Commerce was recently held at Paris, France. Some 500 delegates from the five countries that participated last fall in the International Trade Conference—Belgium, Great Britain, France, Italy and the United States—were in attendance. An organization was effected and officers and directors elected. Business interests in other countries will be taken into membership later.

The meeting gave the delegates an opportunity to take up many questions of international business relations. The more important matters on which action was taken were as follows:

Restoration of international credit, based on fixation of the amount and the conditions of payment for the debts of all countries, allies or enemies; allied states should agree to fix definitely the amount and conditions of payments according to the stipulations in the treaty; avoidance of duplicate taxation of wealth of individuals or organizations in more than one country; reduction of unnecessary expenditures of local and national governments; reciprocal international treaties relative to import and export taxes; an international credit bureau was planned; national and local chambers of commerce requested to cooperate with their governments to reduce national and local governmental expenditures; governments and banking, commercial and industrial associations in all countries urged to cooperate with the International Chamber and with each other to reduce importation of nonessentials by countries whose exchanges are depreciated, and to increase exportations from such countries; endeavor to obtain the cooperation of labor to prevent delay in the turn-around of ships, delay between ships and trains, and delay in transportation by rail; restriction upon countries whose exchanges are depreciated issuing foreign loans; a reconstruction special committee to study the exchange situation; inducement of foreign investments in home countries; encouragement of tourists through removal of unnecessary restrictions; facilitation and simplification of passport procedure; committee to investigate the mischievous use of trade names and of misleading indications; common nomenclature for customs tariffs of the allied nations; revocation of import and export prohibitions as soon as internal conditions of each country will allow; petition to the Board of Directors to establish a central bureau for international statistics covering production with forecast of output and probable needs of each country; utilization of hydro-electric power, development of measures for the use of mineral fuel scientifically and economically, and development to the utmost of research in the extraction of coal and oil resources of the world.

The full meeting expressed an opinion that Germany had not demonstrated an intention to fulfill its obligations to the Allies, as agreed in the Treaty of Versailles. Allied governments were urged to tolerate no further delay in the carrying out of the treaty agreements.

The next meeting of the International Chamber will be held in London, England, next June. Temporary headquarters have been established in Paris. The location of the permanent headquarters is left to the Board of Directors.

UNDER THE TRADE NAME "SWEET RUBBER CEMENT NAPHTHA," a solvent is being offered to the rubber trade that is said to give excellent service in the manufacture of rubber cement. The product is refined entirely from Bradford, Pennsylvania, crude oil. There is no mixture of any kind. It has a very sweet odor, an initial boiling point of 112 degrees F. and a final boiling point of 326 degrees F.

Construction of Steam Hose.[1]

By John M. Bierer.[2]

Steam hose can be constructed with a seamless machine-made tube, or with a tube plied from calendered stock. Furthermore, the hose can have for its fabric element a duck of given weight and number of plies or a combination of plied duck and one or more plies of braid. To determine whether it is more satisfactory both to user and to manufacturer to make a seamless or a plied tube, and to make a simple multiple-ply duck construction or a combination duck and braid construction, three series of tests, carried out individually and independently by The B. F. Goodrich Co., The Goodyear Tire & Rubber Co., and the Boston Woven Hose and Rubber Co., have been made, the results of which are here offered.

The actual steam hose tested by the three investigators was obviously of different material, particularly as to compounds, so it is most reasonable and enlightening to survey the different series separately in order not to make the materials a factor in any comparison of constructions.

The tests by the Goodrich experimenters endeavored to compare both seamless with plied tubes and simple duck with duck-braid construction. All samples were 1⅝-inch inside diameter, with tube ⅛-inch thick, cover 1/32-inch thick, duck 20 ounces per square yard and braid 12⅔ yarn. The hose was tested in a vertical position (so as not to have condensed steam present), under intermittent steam pressures, ten hours under pressure and two hours' rest until failure.

The results of the Goodrich tests are summarized in Table I. Each result represents an average of five individual samples of each construction.

Sample B was of distinctly lighter weight than A or C, so it is not surprising that failure occurred earlier than the A and C samples, which were comparable to each other. C and D were different only in the construction of tube, so that the longer service of C was undoubtedly due to the absence of seams, joints, or plied surfaces, which tend to open up. Similarly, A and C were different in fabric construction, with the same tube, so that the better endurance of C can safely be laid to the superiority of the simple plied duck to the braid and duck construction.

It takes little studying of these experiments to notice two facts already known to many familiar with steam hose. The steam hose with seamless tube lasted about half again as long as that with a plied tube; and likewise the hose with simple duck of sufficient plies lasted about half again as long as the hose with a combination of duck and braid.

Summarizing the experiments of The Goodyear Tire & Rubber Co., there appears a series of similar results. Table II represents an average of five individual samples of each construction. Comparison is offered in this series also of seamless and plied tubes, of duck and duck-braid constructions, and of expansion and contraction measurements as well. Like the Goodrich tests, the hose was tested ten hours under pressure and two hours' rest until failure.

Table I.—Results Obtained in Tests by The B. F. Goodrich Co.

	Sample.			
	A	B	C	D
Number of plies of duck	3	4	6	6
Number of plies of braid	2	0	0	0
Tube	Seamless	Seamless	Seamless	Plied
Endurance under 60 lb. pressure, hours	2261	904	3143	2170

Owing to details of manufacture, there is necessarily not found the same percentage ratios of endurance among the various constructions that were found in the Goodrich tests, but inspection of the results will reveal certain facts more important than this detail. The hose with the seamless tube C outlasted that with the plied tube D and the hose with the simple plied duck construction C outlasted that with a combination of duck and braid E. These results, though not so strikingly shown, are in accordance with those obtained in the Goodrich experiments. A further feature should be noted, that though the expansion in lateral dimensions and contraction in length are favorable to the duck-braid construction, the difference is so small between the two styles that any real and practical superiority for the braided hose would be negligible in practice.

The next experimental data to show divergence among the constructions are those obtained at the Boston Woven Hose & Rubber Co. laboratories. In order to determine the relative value of a hose with simple plied duck and hose with a combination of duck and braid, and to determine the relative value of seamless tubes and plied tubes, the following constructions were given prolonged tests. All hose was of 1-inch inside diameter, ⅛-inch tubes, 0.050-inch covers, and was tested in 3-foot lengths. Two series of tests were carried out: the first at 60-pound steam pressure intermittently 124 hours on and 44 hours' rest, the second continuously at 180-pound pressure, both until failure. Eight individual samples were tested in each series and the results summarized are an average of these:

Table II.—Results of Experiments of The Goodyear Tire & Rubber Co.

	Sample.				
	A	B	C	D	E
Number of plies of duck	2	4	6	6	3
Number of plies of braid	2	0	0	0	2
Tube	Seamless	Seamless	Seamless	Plied	Seamless
Endurance under 60-lb. pressure, hours	1506	1198	1624	1493	1612
Expansion of diameter in 1,000 hours, per cent	6.1	12.2	8.2	8.1	7.0
Contraction in length in 1,000 hours, per cent	1.6	3.2	3.7	3.6	1.8

For a given fabric construction, hose with seamless tubes A lasted about one-fifth again as long and B almost twice as long as those with plied tubes C and D. Furthermore, for the same style of tube, hose with simple plied duck A lasted half again as long and C over twice as long as those with duck and braid construction B and D.

In these tests, owing to particularly careful workmanship on the samples, failure was not due primarily to separation of the seam or joint on the inner surface of the tube. But in the ordinary process of manufacture, without such undue care and special attention, the plied tube is always a danger, and this splitting and opening up of the tube is practically a fatal objection to the success of any hose by this method. This series is a clear case of superiority of seamless tubes over plied tubes, and of simple plied duck over a combination duck and braid construction.

Table III.—Results Obtained by the Boston Woven Hose & Rubber Co.

	Sample.			
	A	B	C	D
Number of plies of duck	6	3	6	3
Number of plies of braid	0	2	0	2
Tube	Seamless	Seamless	Plied	Plied
Endurance under 60-lb. intermittent pressure, hours	2607	1770	2143	950
Endurance under 180-lb. constant pressure, hours	67	26	62	17

CONCLUSIONS.

Three different experimental laboratories, working individually and independently, found consistent results in an effort to determine the relative values of seamless and plied tubes, and of

[1]Published by courtesy of the American Society for Testing Materials. Paper read at the annual meeting of the Society at Asbury Park, New Jersey, June 22-24, 1920.

[2]Chemist, Boston Woven Hose & Rubber Co., Cambridge, Massachusetts.

simple duck and duck supplemented by braiding. From the data gathered, there are two conclusions concerning these relative values which are obvious and irrefutable:

1. Steam hose made with seamless tube (in practice by the tube-machine method) is superior in endurance under steam pressure to hose with tube made up of successive plies of a sheeted stock, sometimes known as a calendered tube. The hose with plied tube was found to fail by the splitting and separation of the seam necessarily formed at the surface of the tube in its construction.

2. Steam hose with its fabric constructed of successive plies of frictioned duck is superior in endurance to, and the practical equal in expansion and contract of hose made of a fewer number of plies of duck supplemented by plies of braiding.

It is most advantageous to user and to manufacturer alike to construct steam hose with a seamless tube and for its fabric element a sufficient number of plies of duck only.

SPECIFICATIONS FOR RUBBER JAR RINGS.[1]

GENERAL.

This specification covers the requirements for rubber jar rings to be used for the canning of vegetables, soups, meats, fruits, etc.

TESTS.

TECHNICAL.

(a) Measurements	Minimum.	Maximum.
Internal diameter	2.20	2.32
Width of flange	.28	.34
Thickness	.078	.09
Tensile strength	350 lbs. per square inch	
Ultimate elongation	150 per cent.	

Tensile strength and elongation determined in machine jaws separating at rate of 20 inches per minute.

PRACTICAL.

A rubber ring may meet the tests as to thickness, width of flange, and inside diameter and still be unfit for use with the cold-pack method, consequently the following practical tests should be applied.

Boiling Water Test.—Select three jars, one having a very even top, well fitted; one, a top somewhat warped; and one, a very poorly fitting top. Fill the jars three-quarters full with boiling water, place the rubber rings in position, partially seal the jars, place them in the water bath under canning conditions, and boil for four hours. At the close of the period, remove the jars from the bath, tighten down the clamps, permit the jars to stand over night and then open. The rubber rings when removed and examined carefully should show the indentation of the top on the ring clearly and distinctly. There should be no signs of movement of the rubber ring, and the ring should still have much of its strength and elasticity and should show no signs of cracks or cuts resulting from pressure on the jar due to the vacuum within.

Steam Pressure Test.—Select, fill, and seal the jars as for the boiling water test. Place the jars in a steam-pressure canner and sterilize for two hours under 10 pounds steam. At the close of the period permit the pressure to drop naturally and remove the jars in the same manner that canned fruit or vegetables would be removed. Press the clamps down, allow the jars to stand over night, and then open. The conditions found should be the same as specified under the boiling water test.

Oven, or Dry Heat Test.—Many rubber rings are satisfactory when first manufactured, but upon aging become unfit for use. In order to apply this aging test, tie three new rubber rings to a string and suspend them in the oven at 300 degrees F., dry heat. for 1 hour. At the end of that time the rubber may show small cracks on the surface when bent back upon itself, but should not crack through.

Tests Made by the Housewife.—The following tests may be carried out by the housewife to determine the quality of jar rings:

(a) Tensile strength.

Fill a light-weight pail with one gallon and seven pints of water (total weight approximately 17 pounds). Place the jar ring around an empty spool; pass a wire through the center of the spool and fasten to handle of the pail; then pass the round handle of a wooden spoon or broom through the ring and lift. The ring should not break.

(b) Elongation.

Cut a six-inch piece out of a ring; take hold of the ends so that there are four inches between the fingers; stretch the piece along a ruler until the fingers are ten inches apart. The sample should not break.

(c) Twelve rings stacked should measure approximately one inch.

(d) Marking.

Packages of rings should be plainly labeled with the year of the canning season during which they are to be used. They should pass these specifications throughout the year to meet the approval of the Department of Agriculture. Rings left over may either be sold the following year in the original containers, or, if they will still pass specifications, may be repacked or relabeled. The manufacturer or dealer doing this shall assume all responsibility in redating the cartons.

[1]Submitted to Department of Agriculture by the Department of Commerce, Bureau of Standards, Washington, D. C.

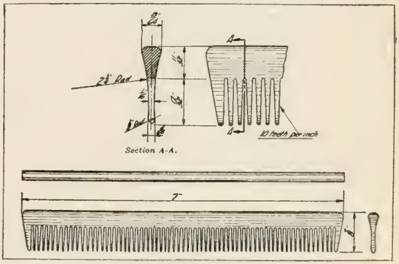
WAR DEPARTMENT SPECIFICATIONS FOR RUBBER COMBS.

NO. 336-1-1, JUNE 5, 1919.

General.—The comb shall be made of highest quality black hard rubber, have an oval back, mat finish, and the entire comb rubbed to a very smooth finish so that there shall be no sharp edges on or between the teeth.

Construction.—See drawings, which are a part hereof.

Length, 7 inches; 10 teeth to the inch; 7/8-inch from the point of the teeth to the tip of the back. The teeth shall be 17/32-inch



Construction of Government Rubber Comb.

long and the distance from the base of the teeth to the tip of the back shall be 11/32-inch. Thickness of comb through heaviest part of the back shall be 13/64-inch and narrowest part, about the middle of the teeth, shall be 1/16-inch through; at the heaviest part of the teeth, near the end, shall be 1/8-inch. Thickness of the teeth through the comb shall be 5/64-inch.

Weight.—Shall be not less than 9 nor more than 10 grams.

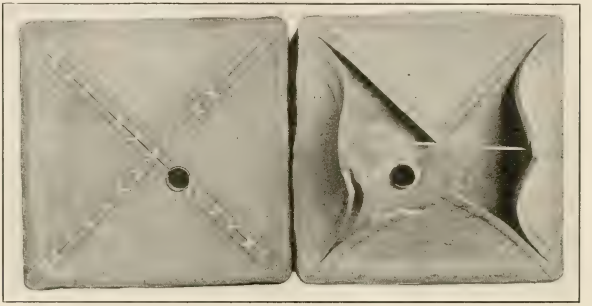
VIROL.

An organic accelerator described as being powerful, but not expensive, is the latest material in that line offered to rubber manufacturers. It is safe and can be used in any stock. Besides hastening the cure it is said both to toughen the stock and improve its aging quality.

Rubber Armor for Airplane Gasoline Tanks.

Rubber was long ago suggested as a possible defensive armor for battleships, the idea being that many projectiles would not penetrate it owing to rebound and deflection, and that holes made by those which did pierce the rubber would quickly and almost completely close again. While this dream has never materialized, one of the most vital, vulnerable and dangerous parts of airships is now being protected on the same principle with much success, and an added measure of safety and endurance has been given to Uncle Sam's bird-men by rubber.

Gasoline tanks on United States Army airplanes are being equipped with rubber and fabric coverings in order to prevent leaks in case the tank is penetrated by bullets and thus the fire hazard is reduced. There are two types of these leak-proof coverings, detachable and fixed, the former being furnished whenever practicable.



Detachable Leak-Proof Covering for Army Airplane Gasoline Tanks.

The tank or tank form is first covered with tire breaker fabric with the coated face outside. A 1/16-inch ply of pure, first-grade washed and dried smoked sheet rubber is then applied over the breaker fabric. Over the crude rubber is applied a ⅜-inch layer of rubber compound, and the three layers are rolled down into close and uniform contact over the whole surface of the tank, when the completed covering on the tank or form is vulcanized and the accessory fittings for filling the tank are installed. The coverings conform to government dimensions and a tolerance of plus ⅛-inch is permitted on overall height, breadth and length. No minus variation in the thickness of the walls is allowed. All openings for accessory fittings are reinforced with fabric strips or washers.

Coverings of the detachable type have four triangular end flaps laced together which permit insertion or removal of the tank. Attached along the edges of these flaps before vulcanization are strips of 17¼-ounce tire duck. These fabric strips are to reinforce the edges which hold the lacing eyelets, which are standard brass grommets.

The rubber compound from which the main body of the rubber covering is made contains not less than 92 per cent by weight of new washed and dried, hard fine Pará, or the highest grade only of new *Hevea* plantation rubber, 6 per cent by weight of sulphur, and not more than 2 per cent by weight of magnesium oxide.

The utmost precautions are taken to safeguard the quality of the materials and workmanship. The required tensile strength of the compound is at least 1,800 pounds per square inch. The elongation of a two-inch section at the breaking point is at least 700 per cent. When the specimen is stretched from two to fifteen inches, held in the stretched position for ten minutes and then released for ten minutes, the permanent elongation must not exceed 12½ per cent. Great care is exercised during the whole manufacturing process to exclude grit, dust or foreign substances from the interior of the tank.

Tensile test specimens of the rubber compound are cut with a die from samples furnished by the manufacturer, or from a sample covering. Samples are required to be approximately 3/32 or ⅛-inch thick with the constricted portion of the specimen ¼-inch wide and having smooth edges.

Manufacturers are required to furnish, at their own expense, with each heat of tank coverings, a sample eight inches square of the covering made up as applied to the tank. It must be vulcanized at the same time and under the same conditions as the coverings it represents, and be guaranteed to consist of the same materials. All materials and finished coverings are subject to inspection by the Inspection Section, Procurement Division, of the Air Service, and acceptance or approval of the materials in process does not infer acceptance of the finished product. All accepted coverings are plainly marked with the official acceptance stamp of the Air Service. The manufacturer's name or trade-mark, the Air Service production order number, style of covering and the date of manufacture are permanently impressed on the outside of each rubber covering, and the coverings or covered tanks are packed for shipment as directed by the purchaser.

The Air Service reserves the right of free access for its inspectors to all parts of the manufacturer's plant concerned in the manufacture of these coverings; also of adequate facilities for determining that the materials and coverings conform to specification, and of the opportunity to check and mark all materials in process or in stock.

The information and illustration used in this article were supplied by the Specifications and Standards Section, Engineering Division, Air Service, United States Army, Dayton, Ohio.

ADJUDICATED PATENTS.

Elyria National Rubber Heel Co. *vs.* I. T. S. Rubber Co. United States Circuit Court of Appeals, Ohio.

The Tufford reissue patent, No. 14,049, for a rubber heel, held not infringed on review of an order granting a preliminary injunction. ("Federal Reporter," volume 263, page 979.)

ST. LOUIS AS A MANUFACTURING CENTER.

The St. Louis, Missouri, Chamber of Commerce is circulating very convincing literature telling manufacturers who are contemplating a change of location, or the establishment of a branch office, just why St. Louis should be chosen.

The city's recent successes in inducing large business concerns to come there are chiefly due to central location, favorable transportation facilities and rates both by land and water, available raw materials, and the excellent living and housing conditions.

A Direct Method for the Determination of Rubber Hydrocarbon in Raw and Vulcanized Rubber.[1]

By W. K. Lewis and W. H. McAdams.

INASMUCH as this paper will not deal with the structural formula of rubber, the conventional formula $(C_{10}H_{16})n$ will be used to designate rubber hydrocarbon, with the understanding that this contains *2n* double bonds. Two types of reaction are possible, involving in the first case, addition, and in the second, substitution, of bromine.

$$(C_{10}H_{16})n + 2n\,Br_2 = (C_{10}H_{16}Br_4)n \quad (1)$$

$$(C_{10}H_{16})n + nBr_2 = (C_{10}H_{16}Br)n + nHBr \quad (2)$$

In the second reaction it will be noted that *two* atoms of bromine are necessary to substitute *one* atom of hydrogen, thereby producing one formula weight of hydrogen bromide.

This paper deals with the application of the McIlhiney method, developed for unsaturated oils, to rubber hydro-carbon. Briefly, it consists in determining by a volumetric method the substitution which does occur under the particular conditions of the analysis in question, and deducting twice the observed substitution from the bromine consumed, which gives the measure of the true bromine addition, from which the rubber hydrocarbon is readily calculated.

RAW RUBBER PREPARATION OF PURE RUBBER HYDROCARBON SOLUTION.

Plantation pale crêpe was extracted overnight with acetone in the standard extraction apparatus to remove the resins, then carefully dried, dissolved in pure carbon tetrachloride, and finally filtered to remove the proteins and other insoluble matter. The resulting hydrocarbon was analyzed by evaporation to determine the total solids present in a known volume, and this known rubber hydrocarbon content was used as a basis of comparison with the calculated figures found by bromine addition as described below.

PROCEDURE.

To a known volume of the above pure rubber hydrocarbon solution, containing approximately 0.2 g. $(C_{10}H_{16})n$, a measured volume of bromine in pure carbon tetrachloride corresponding to approximately 150 per cent excess bromine above that necessary for addition was added, and the mixture was allowed to stand in glass-stoppered bottles for varying lengths of time in a dark closet at room temperature. After this exposure to bromination, 10 cc. of a three per cent potassium iodide solution were added to take up the excess bromine, and the resulting iodine was titrated by means of 0.25 normal standard sodium thiosulphate, using starch paste as an indicator. In order to determine the substitution which had occurred, 10 cc. of five per cent potassium iodate were now added to convert the equivalent of the hydrogen bromide into iodine, which was then titrated to a second endpoint. A blank was run under the same conditions as the rubber determination in order to determine the bromine added to the rubber analysis, and to eliminate any error caused by impurities in the reagents used. The sample calculation given below indicates the relations of the various ratings:

Rubber taken = 0.2000 G. Thiosulphate Solution = 0.235 Normal
Equivalent Weight of Rubber Hydrocarbon, $(C_{10}H_{16})n$ = 34

	Cc. Thio.
For blank	70.00
Excess found by first titration	38.00
Consumed	32.00
Twice second titration, (2) (3.5)	7.00
True addition	25.00

$$\frac{25.00 \times 34 \times 0.235 \times 100}{0.2000 \times 1000} = 100 \text{ per cent theoretical addition}$$

Notes. In order to avoid loss of bromine vapor upon opening the bottle after the bromination period, the bottle was cooled by immersion for a few minutes in ice water, in the dark, and the potassium iodide solution was introduced by means of 1-inch rubber tubing attached to the neck of the bottle and extending up above the stopper.

The carbon tetrachloride was purified by subjecting it to the action of saturated chlorine water for several days in diffused daylight, followed by washing with water and drying with calcium oxide, previous to a distillation in which the fraction boiling within one degree C. of the proper boiling point was taken.

VULCANIZED RUBBER.

The above results have shown the method to be satisfactory for raw rubber; it remained to adapt it to vulcanized rubber. Since carbon tetrachloride will not "dissolve" vulcanized rubber, a new "solvent" had to be obtained, and the choice was tetrachlorethane.

In addition to the rubber hydrocarbon, resins, and proteins present in raw rubber, vulcanized rubber may contain fillers and compounding materials, such as mineral oxides or salts, carbon, mineral rubber, organic accelerators, vulcanized oils (factice), free sulphur, and sulphur combined as polyprene disulfide, $(C_{10}H_{16}S_2)_n$.

The acetone extraction of the finely cut sample was made to remove not only resins but also free sulphur and other acetone soluble materials. The rubber residue was dissolved by refluxing with tetrachlorethane[2] for several hours, diluted to a definite volume with carbon tetrachloride, and allowed to settle, then an aliquot part was pipetted out for bromination as in Brandegee's method. The finely divided fillers were excluded from the aliquot part so taken by placing a wad of cotton in the tip of the pipette, and applying a gentle suction.

COMBINED SULPHUR PROCEDURE.

The combined sulphur was found by evaporating to dryness in a porcelain casserole an aliquot part of the tetrachlorethane solution free from insoluble matter, and determining the sulphur by the method of Davies.[3] This consisted in adding 10 cc. of saturated arsenic acid solution, 10 cc. of fuming nitric acid, and three cc. of bromine water and evaporating to a sirupy consistency. (If all the organic matter is not destroyed, more fuming nitric acid is added, and the mixture again evaporated to a sirupy consistency.) After the addition of a few crystals of potassium chlorate, the solution is evaporated to dryness, heated to boiling with 50 cc. of ten per cent hydrochloric acid solution, filtered through paper, and diluted to 300 cc. with distilled water in a beaker. The sulphuric acid is precipitated as barium sulphate by the addition of barium chloride, and determined gravimetrically in the usual manner.

CALCULATION OF TOTAL RUBBER HYDROCARBON.

The rubber hydrocarbon combined with the sulphur thus found is calculated by multiplying the percentage of sulphur by

$$\frac{C_{10}H_{16}}{S_2}, \text{ or } \frac{136}{64} = 2.13.$$

---

[1]Published by courtesy of the American Chemical Society. Read before the Rubber Division of the American Chemical Society, at St. Louis, Missouri, April 12-16, 1920.

[2]This solvent was purified in the same manner as the carbon tetrachloride.

[3]"Chemist-Analyst," 15 (1915), 4. THE INDIA RUBBER WORLD, October 1, 1916, page 11.

The total rubber hydrocarbon is calculated by adding the rubber hydrocarbon combined with the sulphur and the uncombined rubber hydrocarbon found from the bromine addition.

PROCEDURE FOR VULCANIZED RUBBER.

Extract a weighed sample (approximately 1.5 to 2.0 g.) of vulcanized rubber with acetone for 8 hours in the standard extraction apparatus, evaporating the acetone to obtain the percentage of acetone-soluble material.[4] Aspirate carbonic acid through the rubber to remove the traces of acetone, reflux four hours, with approximately 100 cc. of tetrachlorethane, cool, and make up to mark in a 250-cc. calibrated flask with carbon tetrachloride. Remove a 25-cc. aliquot portion by applying gentle suction to a pipette containing a small piece of cotton in its tip. Place this sample in a glass-stoppered bottle of 250 to 500 cc. capacity, add from a burette a measured amount of bromine in carbon tetrachloride corresponding to at least 100 per cent excess bromine above that necessary for the addition reaction, insert the stopper tightly, and allow to stand for three hours in a dark closet. At the end of this time, darken the room, add 10 cc. of 10 per cent potassium iodide solution, shake, and titrate rapidly with 0.1 normal standard sodium thiosulphate, using starch paste as an indicator. As soon as the first end-point has been noted, add 10 cc. of 1 per cent potassium iodate solution, and titrate rapidly to the second end-point with thiosulphate. The titration of a blank run under similar conditions gives the thiosulphate equivalent of the bromine added.

The method of calculation of the results is entirely similar to that used in the case of raw rubber, except that, to get total rubber, the rubber equivalent to combined sulphur is added to that determined by bromination.

RESULTS.

TABLE I RUBBER HYDROCARBON BY ADDITION.

Sample.	Individual Runs, Per Cent.				Average Per Cent.
A	86.2	86.6	82.2	83.8	85.5
B	63.5	66.5	..	..	65.0
C	56.6	52.6	52.7	50.7	53.2
D	54.2	55.0	53.5	55.0	54.4
E	45.4	45.2	..	..	45.3
F	80.5	81.9	74.9	74.7	78.0

The final analyses are summarized in Table II.

TABLE II.

Sample.	Acetone Extract, Per Cent.	Nature of Compounding Material.	Combined Sulphur, Per Cent.	Rubber Equivalent of Combined Sulphur, Per Cent.	Uncombined Rubber (by Bromination) Per Cent.	Total Rubber (by Analysis), Per Cent.	Total Rubber Known Composition, Per Cent.	Error in Total Rubber Hydrocarbon, Per Cent.
A	3.46	None	3.4	7.2	85.5	92.7	93.7	—1.05
B	1.90	Litharge	3.1	6.6	65.0	71.6	75	—3.4
C	2.33	Zinc oxide	3.3	7.0	53.2	60.2	60	+0.2
D	2.33	Sublimed lead	1.6	3.5	54.4	57.9	60	—2.1
E	...	Zinc oxide and organic accelerator	1.1	2.4	45.3	47.7	48	—0.4
F	...	Mineral rubber and accelerator	2.16	4.6	78.0	82.6	80.5	+2.1

Table II compares the percentages of total rubber hydrocarbon as found by analysis with the known figures for rubber content supplied by the compounders of the samples. In no case did the analyst have any information as to the composition of the samples. The analytical figures average low, as they should do, because of the resin and protein content of the raw rubber. The analytical results are, however, probably high for true rubber hydrocarbon, because any sulphur combining with resin, protein, or accelerator to give a product insoluble in acetone but soluble in tetrachlorethane is figured over to its equivalent of rubber, and, further, any sulphur substituting in rubber hydrocarbon itself will increase the results. These factors are probably negligible, except for sulphur combined with artificial accelerators. Any unsaturated organic material insoluble in acetone but dissolved by tetrachlorethane will also increase the analytical results. This is probably a cause of the high figures in the presence of mineral rubber. Few compounding materials are sufficiently unsaturated, however, to be serious in this regard.

It is believed that this procedure is by far the simplest and most accurate direct estimation of the rubber content of vulcanized articles. It should prove especially useful in the evaluation of shoddies, because it shows the extent to which the unsaturation of the rubber has disappeared, due to previous vulcanizations.

Within the experimental error, the results prove that rubber hydrocarbon is unsaturated to an amount equivalent to four atoms of bromine for each $C_{10}H_{16}$, and further that "combined" sulphur reduces this unsaturation by two bromine atoms for each sulphur combined. These facts seem incompatible with any theory other than that the sulphur taken up by rubber on vulcanization is chemically combined.

[4] In case "factice" (vulcanized oil) is present, it should be removed by treatment in the usual manner by extraction with alcoholic potash. This treatment was unnecessary for the samples used.

£5,000 IN PRIZES FOR NEW USES OF RUBBER.

THE Rubber Growers' Association, Inc., offers the following awards for ideas and suggestions for extending the present uses or for encouraging new uses of rubber: one prize of £1,000; three prizes of £500 each; ten prizes of £100 each; a sum not exceeding £1,500 to be divided among the remaining competitors whose suggestions are considered to be of value, according to the relative value of their suggestions, but so that no competitor will receive more than £100.

Suggestions must be practical and likely to increase the demand for the raw material. Ideas will be welcomed for the application in new directions of existing processes, methods or manufactures, or for improvements or new processes which will facilitate or cheapen the production of rubber goods.

Competent judges (technical and otherwise) will be appointed to investigate and adjudicate upon the suggestions received.

All competitors must accept the following conditions:

CONDITIONS.

1. Special value will be attached to suggestions of a thoroughly practical nature, supported by reasons and detailed information likely to make them effective.

2. The relative value of suggestions which are deemed practical will depend upon the quantity of raw rubber their adoption would absorb, and special consideration will be given to practical suggestions likely to utilize rubber in *large* quantities.

3. No apparatus, method or process suggested is to be protected in any country by letters patent or otherwise by the competitor or the Rubber Growers' Association. Every successful competitor must be prepared, if requested by the Rubber Growers' Association, to make a statutory declaration (at the expense of the Association) that he has not made and does not intend to make, and that to the best of his knowledge and belief, except as disclosed by him in compliance with clause 5 (*f*) of these conditions, no other person has made or intends to make, any application for letters patent (or like protection) in respect of the method, apparatus, or process suggested by the competitor, and that, to the best of his knowledge and belief, the method, apparatus or process suggested is not the property of any person other than the competitor.

4. The Council reserves the right at any time to publish, test, and otherwise deal with suggestions made by any competitor, whether he receives a prize or not, in any manner which is thought likely to stimulate the demand for raw rubber, and all competitors shall be deemed to have authorized such publication, testing or dealing with as the case may be.

5. Each suggestion to bear a *nom de plume* or number, which should be placed upon the right hand corner of each page used. Particulars should be clearly and legibly written or typewritten on one side of the paper only.

In submitting suggestions competitors shall give the following particulars, with such others as they deem advisable:

(*a*) A short preliminary description of the suggestion.

(*b*) As full a detailed description as possible should follow, with explanations, samples (if any), diagrams and designs to enable the suggestions to be fully adjudicated upon by the judges and, if necessary, adopted by a manufacturer.

(*c*) The facts upon which the competitor bases his belief in the value and practicability of the idea, and his special means of knowledge (if any).

(*d*) Any information the competitor may have as to: (1) The cost of manufacture of the article; (2) the possible demand for it; (3) the quantities of raw rubber likely to be utilized in its manufacture.

(e) Whether the suggestion has been already adopted partially or wholly and by whom and when and with what results.

(f) Whether the suggestion is, in the competitor's knowledge, in any way covered by patent laws, or has been the subject of any application for letters patent by any person, or is in any way affected by any letters patent, etc., in any country.

6. The decision of the judge or judges shall be final and binding on all competitors and will be communicated direct to all the competitors.

7. In the event of the judges considering two or more suggestions to be of equal merit, or in the event of a disagreement between the judges, power is reserved to divide the prizes.

8. Suggestions must be accompanied by a sealed envelope bearing outside the *nom de plume* or number, and inside the real name and address of the competitor. Names of prize winners only will be published.

9. All competitors shall be bound by the conditions governing this competition.

10. The closing date for receiving suggestions from competitors is December 31, 1920. Envelopes will not be opened before this date.

11. Suggestions should be addressed to: The Rubber Growers' Association Prize Competition, care of Messrs. Fitzpatrick, Graham & Co., Chartered Accountants, 95a, Chancery Lane, London, W. C. 2.

N. B.—All inquiries in connection with the competition (other than the competitive suggestions) should be addressed to The Rubber Growers' Association (Dept. C), 38, Eastcheap, London, E. C. 3.

PEACHEY'S NEW VULCANIZATION PROCESS.[1]

By S. J. Peachey, M. Sc. Tech, F. I. C.

The vulcanization of rubber is effected at the present time by one of two methods, the hot cure, which is extensively employed in the production of the great majority of rubber goods, and the cold cure, which finds application mainly in the manufacture of thin sheet rubber goods, dipped articles and rubber proofed fabrics.

The first method consists in mixing the rubber with a certain proportion of sulphur, and heating the compound to a temperature of 130 to 150 degrees C. for a period of time, which varies with the amount of sulphur employed, and averages perhaps one to three hours.

The second process was discovered by Parkes. Its application in the industry is limited by the fact that it produces a mere surface vulcanization, and can therefore be employed only for thin rubber sheets or surfaces.

From the time of Parkes' discovery of the sulphur chloride process in 1846—three-quarters of a century ago—nothing in the nature of a chemically new method of vulcanization had been brought forward until the year 1918, when the process forming the subject matter of British Patent No. 129,826 was discovered by the writer, as the result of an investigation on the behavior of rubber towards the various allotropic forms of sulphur.

Briefly the new process consists in exposing rubber, alone or in admixture with practically any useful filling agent or pigment, successively to the action of two gases, sulphur dioxide and hydrogen sulphide. The gases diffuse into the rubber and there interacting produce a particularly active form of sulphur, which is capable of combining with and vulcanizing the rubber, even at the ordinary temperature. The reaction presumably takes place according to the equation:

$$2H_2S + SO_2 = 2H_2O + 3S.$$

Unlike the Parkes process, which yields an addition product containing both sulphur and chlorine, the new process leads to the formation, without the aid of the heat, of a sulphur addition product, comparable in every way with that produced by the hot vulcanization process.

The process is applicable not only to rubber in its ordinary form, that is to say, as an elastic or plastic solid, but also to dissolved rubber. The treatment of a rubber solution alternately with the two gases mentioned above brings about complete pectization of the solution to a jelly consisting of vulcanized rubber distributed through the solvent. On expelling the latter by evaporation a fully vulcanized rubber of excellent quality is obtained.

The new process, eliminating as it does the use of heat and of sulphur chloride, renders it possible to introduce into the rubber a large selection of coal tar dyestuffs and lakes, and even natural coloring matters such as chlorophyll, and to produce vulcanized rubbers possessing pure and delicate shades of color quite unobtainable under the old conditions. Further, organic filling agents, such as leather waste, sawdust, wood meal, and the like, which are decomposed or partly decomposed at the temperature employed in the hot vulcanization process, or by the action of sulphur chloride in Parkes' process, can be introduced by the new method into rubber mixings, yielding cheap vulcanized products possessing new properties and a high degree of durability.

In this manner, for example, employing wood meal and a small proportion of rubber, it becomes possible to produce a new and very cheap class of material to replace linoleum and other floor coverings, with distinctly superior qualities as regards color, durability and flexibility. Similarly, by incorporating leather waste (buffings or shavings) with a comparatively small amount of rubber, and vulcanizing by the new process, it becomes a simple matter to manufacture a reformed leather closely resembling the real article in appearance and character, and possessing even greater durability. The process lends itself to the manufacture, not only of hard-wearing leathers suitable for boot and shoe manufacture, but also of delicately tinted and grained leathers for upholstery and artistic work. Further, by the application of the new solution process, the reformed leather may be built up into any desired article, the seams united by vulcanization, and stitching and riveting wholly dispensed with. In regard to cost, the new process compares very favorably with the existing processes, in that it dispenses with the use of steam and of mechanical pressure, and employs in the place of sulphur and sulphur chloride two gases which can be prepared and manipulated on a large scale at a very cheap rate. The main drawback is the objectionable smell of the gases, but the writer is assured by expert rubber engineers that this presents no difficulty in the application of the process.

[1] "The India-Rubber Journal," London, England, June 19, 1920, pages 23-24.

(*Goodyear News Service.*)

Tree Surgery Is Practiced on the Goodyear 20,000 Acre Plantation in Sumatra. A Native Tree Surgeon Is Here Shown Operating on a Hevea Brasiliensis.

The "EverReady" Products—EverReady solid woven asbestos brake lining and EverReady solid woven asbestos clutch facings are claimed to be especially satisfactory, due to the care bestowed upon their manufacture under the direction of experts. (Kelso Manufacturing Co., Trenton, New Jersey.)

What the Rubber Chemists Are Doing.

THE ACCELERATION OF VULCANIZATION.[1]

Three methods are available for speeding up the vulcanization process: (1) raising the temperature, (2) increasing the proportion of sulphur relative to rubber, (3) introducing an accelerator.

EFFECT OF TEMPERATURE.

The effect of alteration of temperature is similar to that for other chemical reactions, the temperature coefficient being between 2 and 3 (for 10 degrees C.). The suggestion has been made that some accelerators, lead oxide in particular, are not genuine catalysts, but that they merely react with part of the sulphur with evolution of heat, thereby raising the temperature of the reacting mass above that of the surrounding heating medium.[2] The insufficiency of this explanation is evident from the fact that such an effect should be almost negligible at the surface of the rubber in contact with the molds, while in the interior it would be marked; thick slabs also would vulcanize much more rapidly than thin sheets; both these consequences of the theory are contrary to experience. It is quite possible, however, that many vulcanization accelerators do exert a slight thermal effect in addition to their purely catalytic influence.

The curves given in Fig. 1 represent results of some of our experiments as to the rate of vulcanization at temperatures ranging from 138 degrees C. (35 pounds' steam pressure) to 168 degrees C. (95 pounds) for a mixture of pale crêpe rubber (90) and sulphur (10). Pale crêpe rubber was chosen as showing greater uniformity in rate of vulcanization than other forms of rubber, and was taken as far as possible from one case. For the introduction of the sulphur a stock mixing of sulphur with approximately an equal weight of rubber was used. The composition of this mixture was checked by analysis, and the correct proportion weighed out for mixing with the remainder of the rubber. In this way the almost inevitable loss of sulphur dust during the customary method of mixing was avoided.

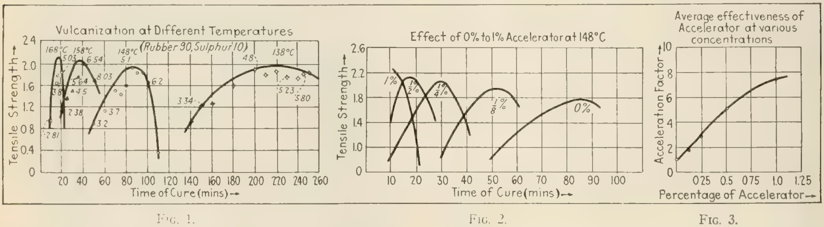


Fig. 1. Fig. 2. Fig. 3.

The progress of vulcanization may be followed in at least three different ways: (a) by the combination of sulphur; (b) by the gradual decrease in the extensibility of the rubber at a definite load (or increase of the load necessary to produce a definite elongation); within the range of the experiments in this paper, this shows a roughly rectilinear relationship with the period of vulcanization. Unfortunately, this method is influenced to a greater extent than either (a) or (c) by the mechanical treatment of the rubber during mastication and the subsequent mixing operation, increased working or heating having a tendency to exaggerate the extensibility figure. The approximation of the curve to a straight line and the close proximity of extensibility values for duplicate samples are evidence of the considerable degree of accuracy attainable with careful working. For the purpose of comparison between different samples an elongation of 600 per cent (including the original length) at a load of 0.5-kilo per square mm. has been arbitrarily assumed as a standard throughout this paper; (c) by the time required to produce maximum tensile strength.

The last method, although of less importance than might be expected in technical practice, is of considerable value in experimental work as supplying a convenient and rapid method for comparing rates of vulcanization, for example, of different rubbers or at different temperatures, the maximum tensile strength, determined within three days of vulcanization, being observed with a product containing approximately 5 per cent of combined sulphur calculated on the rubber. The actual value of the breaking strength of a rubber test piece is always more or less fortuitous; however, as vulcanization beyond the condition necessary for the attainment of the maximum strength causes a very rapid weakening, the position of the maximum is relatively easily determined. The peaked curves in Fig. 1 indicate the position of the maximum rather than the actual magnitude of the values.

It will be observed that the temperature coefficient manifests no tendency to any regular increase or decrease with rise of temperature, the mean value calculated (by all three methods of comparison) from the figures represented in the curves for the rubber-sulphur mixture at 128 degrees to 168 degrees C. approximating to 2.3[3]. This appears to indicate that the allotropic forms ordinarily present in molten sulphur in relative proportions dependent on the temperature, must possess equal or at least comparable vulcanizing activity.[4]

The extent to which the vulcanization period in technical work can be reduced by raising the temperature is limited by various considerations, not the least of which is the poor thermal conductivity of rubber and the consequent danger of unequal heating, involving local irregularities in the degree of vulcanization.

INCREASE OF PROPORTION OF SULPHUR.

Many old compounding ingredients and specifics of the rubber trade, often bearing fanciful names, contained—undeclared—considerable proportions of free sulphur; mixtures of sulphur with various waxes and also with antimony sulphide may be quoted as

[1]By D. F. Twiss and S. A. Brazier, "Journal of the Society of Chemical Industry," May 15, 1920, page 125-132T.

[2]Seidl, *"Gummi-Zeitung,"* 1911, 25, 710, 748.

[3]On account of the inconveniently rapid progress of vulcanization at 168 degrees C. and its slowness at 128 degrees C. the measurements at 138 degrees C. to 158 degrees C. are possibly to be preferred; a mean value of 2.6 is then obtained for the temperature coefficient.

[4]See Twiss, Annual Report of the Society of Chemical Industry, 1919, 4, page 327.

better class examples. As the rate of vulcanization of rubber-sulphur mixings containing less than, roughly, 10 per cent of free sulphur is directly proportional to the percentage of free sulphur, the effect of such additional sulphur-containing ingredients on the rate of vulcanization is obvious, and today is commonly realized.

For experimental work on the relative rates of vulcanization of different rubbers or on the effect of various catalysts, the selection of a mixture of rubber and sulphur containing as much as 10 per cent of the latter is advisable, not only because this quantity is more than sufficient to permit the progress of the change to well beyond the characteristic maximum strength, but also because it is sufficiently high to reduce in extent any disturbance arising from slight inaccuracies in the proportion of sulphur present. The possibility must always be borne in mind, however, that the activity of an accelerator may possibly be influenced by the proportion of free sulphur simultaneously present.

USE OF A CATALYST.

Almost all basic substances can act as catalysts to the vulcanization process, for example, magnesium oxide, lead oxide, lime, sodium hydroxide, potassium hydroxide, and also substances such as sodium amide, potassium glyceroxide and sodium phenoxide, which, by interaction with the traces of water invariably present in rubber, are able to give rise to alkalis or bases; typical examples of organic accelerators are piperdine, quinine (the crude alkaloid mixture known as "quinoidine" is commonly used) aniline, naphthylamine, *p*-phenylenediamine, hexamethylenetetramine, anhydroformaldehydeaniline, benzylidineaniline, aldehyde-ammonia, and simple carbon bisulphide or carbon dioxide derivatives of the amines, such as dimethylammonium dimethylcarbamate, the corresponding dimethyldithiocarbamate and thiocarbanilide. Compounds containing a nitroso-group substituted into an aromatic cyclic nucleus are also effective catalysts, the best known example being *p*-nitrosodimethylaniline. Clearly there is a wide range of possible accelerators of these various types.[5] In this connection there must also be mentioned the possibility of forming catalysts in rubber during its production. If the wet rubber clot, freshly coagulated from the latex, is kept for several days before being rolled and washed, partial decomposition of the nitrogenous constituents of the retained serum sets in with the formation of organic bases. These are not eliminated by the subsequent rolling and washing, so that the resulting rubber exhibits exceptionally rapid vulcanization.

As is illustrated clearly by our results in Fig. 1, the curve representing the rate of combination of rubber and sulphur does not follow the course expected from a simple chemical reaction, but, with less than 10 per cent. of free sulphur, is approximately rectilinear until the almost complete exhaustion of the sulphur.[6] This is probably to be explained by the occurrence of autocatalysis; with mixtures of rubber and sulphur containing more than 10 per cent of the latter, the progress of the fixation of sulphur follows the sinuous S course, which is commonly regarded as characteristic of an autocatalytic process.[7] In the presence of an artificial catalyst, therefore, the compensation relation between the effect of the disappearance of sulphur and the extent of the increasing catalytic effect may be disturbed, so that the fixation of sulphur no longer follows a rectilinear course.[8]

Although the results as to the rate of vulcanization of a simple sulphur mixing, as decided by these three methods, are comparable, in the presence of an extraneous catalyst, this is not necessarily so. The chemical action of sulphur on the rubber induces the physical alterations which constitute the advantage to be gained by vulcanization, but the chemical and physical processes are not necessarily strictly proportionate, and some "accelerators" influence one more than the other. In the presence of certain accelerators the physical or mechanical alteration is disproportionately rapid, and the tensile strength attains its maximum[9] at a coefficient of vulcanization (combined sulphur × 100 ÷ rubber) well below the normal value of 5 (see table below).

Other accelerators, on the other hand, reduce the sharpness of the optimum, so that the peak of the curve is less pronounced. In yet other cases the catalyst may give rise to a vulcanized rubber with an abnormal extensibility relative to its coefficient of vulcanization. Most of them, but not all, by reducing the time of heating necessary, cause the production of a rubber with a higher tensile strength than would be obtained by more tardy vulcanization at the same temperature without the catalyst, and in this direction reduction of the time of vulcanization by using an increased percentage of sulphur can have a similar effect.[10]

The effectiveness of one of the above-named organic catalysts, namely, aldehyde-ammonia, is demonstrated with a mixture of pale crêpe and sulphur (90: 10), at various temperatures from 148 degrees C. (51 pounds' steam pressure) downwards, in an oil bath vulcanizer. Even at a concentration of ⅛ per cent the effect is clearly observable while, with 1 per cent, vulcanization occurs so readily as to be possible in a reasonable period at 108 degrees C. (or less than 5 pounds' steam pressure); the progress of vulcanization has been recorded at 98 degrees C. It will be seen that the temperature coefficient calculated by the ratio of the speed of reaction at intervals of 10 degrees C. from 108 degrees to 148 degrees is practically the same as for the reaction in the absence of an artificial catalyst; the average value for the accelerated mixings being 2.4. This observation militates against the belief of some investigators in this field that vulcanization catalysts are not themselves able to expedite vulcanization, but that during the early stages of the process they combine with sulphur, giving rise to substances which possess the desired activity. This view may be correct in certain cases, but evidently cannot be accepted generally for all vulcanization catalysts. The average values of the coefficient with the various proportions of accelerator are given in the table:

AVERAGE TEMPERATURE COEFFICIENT.

Proportion of accelerator.	1% (108°-148° C.)	½% (118°-148° C.)	¼% (118°-148° C.)	⅛% (118°-148° C.)	Nil (128°-168° C.)
Method of testing -					
(a) Combination with sulphur	2.4	2.3	2.4	2.3	2.3
(b) Elongation at 0.5 kilo, per sq. mm..	2.5	2.5	2.5	2.4	2.3
(c) Maximum tensile strength	2.5	2.5	2.2	2.5	2.4

It is a striking fact that although the individual values of the temperature coefficient between 108 degrees and 148 degrees C. without exception oscillate closely about the mean value of 2.4, the interval 98 degrees—108 degrees C. shows a much greater value exceeding 5.0. This is doubtless due to the melting of the sulphur between these two latter temperatures, the normal melting point being lowered under the obtaining conditions. This observation supplies a confirmation of the argument as to the comparable effectiveness of the various allotropic forms.

The fact observed above, that the temperature coefficient pos-

[5]The presence of nitrogen in all such organic catalysts of vulcanization aids their detection in rubber. The organic accelerator to a considerable extent will pass into solution on prolonged extraction with acetone and the extract consequently will show an abnormally high percentage of nitrogen.

[6]Spence and Young, "Journal of the Society of Chemical Industry," 1911, 817; 1912, 81, 785.

[7]Skellon, Rubber Industry, 1914, 172; van Iterson, "Communications of the Netherland Government Institute for Advising the Rubber Trade and the Rubber Industry," 1916, 7, 247.

[8]van Iterson, *loc. cit.*

[9]This does not refer to the so-called "technical optimum" of vulcanization for which the corresponding coefficient of vulcanization in the presence of a catalyst may fall as low as 2 or 1. (Kratz and Flower, "Journal of Industrial and Engineering Chemistry," 1919, 11, 30.) The technical optimum cure is probably capable of less definite measurement than the maximum tensile strength in the type of mixing used above.

[10]van Rossem, *loc. cit.*, p. 210.

sesses comparable values for mixings with and without an artificial catalyst, appears from other results in our possession to be a general one for all catalysts. This facilitates the representation of the relative effectiveness of different catalysts by means of a numerical factor. A factor representing the ratio of the respective periods of vulcanization required for the attainment of a definite state of vulcanization in a rubber-sulphur mixing, with and without a definite proportion of accelerator, will be independent of the temperature; it will be essential that this comparison be made at a stage of the vulcanization process when the mixture still contains a considerable proportion of uncombined sulphur. The resulting "acceleration factor" may differ according to which of the three possible criteria—percentage of combined sulphur, maximum tensile strength and extensibility at definite load—is taken as fixing a definite state of vulcanization. In the case of the accelerator used in the experiments now quoted, the behavior may be described as normal, all three methods giving comparable results. The effectiveness calculated in this way for the accelerator at various concentrations and at different temperatures is given in the following table; the figures in each case represent the mean of the values obtained by the three different methods for the comparison of rate of vulcanization.

Stated otherwise, the presence of ⅛, ¼, ½ and 1 per cent, respectively, of the accelerator increases the rate of vulcanization at any ordinary vulcanizing temperature to 1.7, 3, 5 and 7½ times the normal.

ACCELERATION FACTOR.

Percentage	⅛	¼	½	1
Temperature C.				
118-128 degrees	1.7	2.8	5.1	7.5
128-138 "	1.7	3.0	5.4	7.6
138-148 "	1.7	3.0	4.8	7.1

A graphic representation of this result as to the relation between the proportion of the accelerator in question and the effect produced is given in Figure 3. The slight divergency from the course of the smooth curve of the points for the lower percentages is doubtless due to the relatively greater effect of the inevitable small loss of accelerator by vaporization during the mixing operation.

Comparison of the relative effectiveness of isomeric substances, namely *m*- and *p*-phenylenediamine as accelerators shows that the meta-compound is notably less active than its para-isomeride. It is of interest to note that the effectiveness of these two substances towards vulcanization falls in the same order as their affinity constants as determined by Bredig in 1894. The low value of the coefficient of vulcanization at the maximum tensile strength of the *p*-phenylenediamine will also be noticed.

The "acceleration factor" for *m*-phenylenediamine, calculated from the results in Fig. 3, has a mean value of approximately 1.5; for *p*-phenylenediamine judged by the physical methods the factor is approximately 3.3, whereas the rate of combination with sulphur indicates a value of only 3.0.

MIXED CATALYSTS.

The effectiveness of a mixture of catalysts in an ordinary chemical reaction is well known not to coincide invariably with the sum of the effects produced by each independently. This peculiarity is also observable with vulcanization catalysts.[11] Lead oxide with magnesium oxide, and *p*-nitrosodimethylaniline with aniline or one of its homologs, are cases which have already been quoted in the literature. A related phenomenon probably is also the power of zinc oxide, which alone does not accelerate vulcanization, to increase considerably the effectiveness of other organic catalysts such as hexamethylenetetramine and thiocarbanilide. As the latter by itself is practically inert, we have the interesting case of a mixture of two inactive substances exerting a distinct accelerating effect. In other cases we have found two vulcanization catalysts to be "incompatible" in the sense that the effectiveness of the more active catalyst is actually decreased by the presence of the other.

As has been intimated already, no acceptable general explanation is yet possible as to the mode of action of vulcanization catalysts. In addition to the theories already mentioned, others have also been proposed. An observation of considerable interest in this connection is that rubber in solution or wetted with benzene becomes vulcanized by successive treatment with sulphur dioxide and hydrogen sulphide at the ordinary temperature.[12] This reaction appears to be very suggestive in connection with the action of vulcanization catalysts. None of the three modifications, S^{λ}, S^{μ}, and S^{π} present in liquid sulphur appears to be in possession of exceptional chemical activity towards rubber (see above), but there is evidently a possibility that there is capable of existence yet another form of sulphur of much greater vulcanizing power. Such a view, needing considerable modification however, has already been tendered[13] but the scope for investigation in this direction is enormous; indeed, the evidence available as yet is insufficient even to exclude the possibility that vulcanization accelerators may activate the rubber and not the sulphur.

CHEMICAL PATENTS.

UNITED STATES.

METHOD OF COLORING FIBROUS MATERIAL.—The process of coloring and rubberizing fibrous material, which comprises dipping the material into a solution of potassium antimonyl tartrate and a solution of a sulphide of ammonium, whereby antimony sulphide is formed directly in or upon the fibers of said material, and coating the material with a vulcanizable plastic compound. (Willis A. Gibbons, Flushing, New York, assignor to American Rubber Co., Boston, Massachusetts. United States patent No. 1,332,982.)

ARTIFICIAL RUBBER.—An elastic composition comprising glycerin, two and one-fourth pounds; glue, five and five-eighths pounds; water, nine pounds; tannic acid, two and one-fourth ounces; and a solution of formaldehyde, four ounces. (Ernest E. Cathcart, Tecumseh, Nebraska. United States patent No. 1,335,-657.)

PROCESS FOR VULCANIZING RUBBER AND PRODUCT OBTAINED THEREBY.—A process for treating rubber or similar material which comprises adding thereto a dye, a vulcanizing agent normally tending to injure the coloring material under vulcanizing conditions and an agent itself having no injurious effect upon the coloring material and adapted to prevent injury by said vulcanizing material and inducing vulcanization to take place. (Iwan Ostromislensky, Petrograd, Russia, assignor, by mesne assignments, to New York Belting & Packing Co., New York. United States patent No. 1,342,457.)

PROCESS FOR VULCANIZING RUBBER AND PRODUCT OBTAINED THEREBY.—A process for treating rubber or similar material, which comprises subjecting the rubber to the action of sulphur and an organic vulcanizing agent containing oxygen and inducing vulcanization to take place under the action thereof. (Iwan Ostromislensky, Petrograd, Russia, assignor, by mesne assignments, to New York Belting & Packing Co., New York. United States patent No. 1,342,458.)

RUBBER VULCANIZATION AND THE PRODUCT.—The process of accelerating the vulcanization of rubber, which consists in vulcanizing the rubber in the presence of a compound of the amine bases produced from beet sugar residue combined with carbon disulphide. (Stuart Benton Molony, Wellesley Hills, Mass., assignor to Michigan Chemical Co., Michigan. United States patent No. 1,343,224.)

[11] Ditmar, *"Gummi-Zeitung,"* 1915, 29, 424.

[12] Peachey, "Journal of the Society of Chemical Industry," 1919, 688A.

[13] Dubosc, THE INDIA RUBBER WORLD, 1918, November 1, 78; 1919, February 1, 248.

THE DOMINION OF CANADA.

Art of Vulcanizing Caoutchouc. The process of effecting the curing of rubber which consists in first bringing together under reacting conditions sulphur and paranitroso-dimethylaniline in the presence of an excess of aniline to produce a sulphur nitrogen accelerator, and subsequently incorporating the latter in the caoutchouc mix and vulcanizing it.

The process of effecting the curing of rubber which consists in first bringing together under reacting conditions sulphur and thiocarbanilide or derivative thereof to produce a sulphur nitrogen accelerator, and subsequently incorporating the latter in the caoutchouc mix and vulcanizing it.

The process of effecting the curing of rubber which consists in first bringing together under reacting conditions sulphur and proteids or nitrogenous derivatives thereof to produce a sulphur nitrogen accelerator, and subsequently incorporating the latter in the caoutchouc mix and vulcanizing it. (The Goodyear Tire & Rubber Co., assignee of Clayton Wing Bedford, both of Akron, Ohio, U. S. A. Canadian patent No. 201,277.)

THE UNITED KINGDOM.

Bottle and Like Capsules. A solution of the chlorine derivative of india rubber known as "duroprene" is first applied to the bottle or other article, and then a medium which will cause the duroprene to precipitate is applied, any remaining solvent and precipitant being afterwards allowed to evaporate. The duroprene may be dissolved in benzene or other solvent, and the neck of the corked or stoppered bottle dipped into the solution and afterwards into methylated spirit or other precipitant. (A. Lamble and United Alkali Co., Cunard Building, Liverpool. British patent No. 141,220.)

Coloring and Vulcanizing India Rubber. The color bases of the basic synthetic organic dyes are mixed with natural or artificial caoutchouc or caoutchouc-like substances and sulphur, and the product is vulcanized under heat. These color bases act either as accelerators or as coloring agents, or both. In an example 57 parts of rubber are mixed with 40 parts of zinc oxide, three parts of sulphur, and one part of the color base of the basic dye auramine-O. Other dyes mentioned, of which the color bases are used, are: methyl violet B, methylene blue, Bismarck brown, magenta, rhodamine B, benzoflavine, safranine, Meldola's blue, thionine blue, thioflavine T. (L. Gaisman, Spring Bank House, Woodley, Stockport, Cheshire, and J. L. Rosenbaum, 11 Trafalgar Square, Ashton-under-Lyne. British patent No. 141,412.)

THE FRENCH REPUBLIC.

Reclaiming Rubber.—Improvements in process for reclaiming rubber. (Xylos Rubber Co., Limited. French patent No. 503,661.)

GERMANY.

Increasing Elasticity of Vulcanized Artificial Rubbers.—(Farbenfabriken formerly Friedrich Bayer & Co., Leverkusen, near Köln am Rhein. German patent No. 301,757.)

Process of Manufacturing Plastic Rubber-like Masses.—The liquor which settles out in the saponification of resins is purified by sedimentation or filtration, then treated in a stirring vessel with dilute sulphuric or hydrochloric acid in a finely-divided state, while heating at about 100 degrees C. The resulting mass is slightly acid, insoluble in water, soluble in alcohol, ether, and caustic alkali; it is plastic when warm and brittle in the cold. (P. B. Ribot, Schwabach. German patent No. 315,847.)

Plastic Composition.—Formation of rubber-like masses out of cellulose waste by adding emollients. (Franz Clouth, Rheinische Gummiwarenfabrik, Köln-Nippes. German patent No. 324,944.)

DENMARK.

Artificial Rubber.—Resin is melted, especially the balsam and refuse resin, with addition of calcium chloride, and the mixture is distilled with continued addition of calcium chloride and calcium chlorate, and the rubber-like mass is mixed with rubber or rubber regenerates freed from factice, tar or the like, and then vulcanized. (F. de la Rosée. Danish patent No. 24,565.)

HOLLAND.

Artificial Rubber.—Stearate of aluminum, manganese, chromium or iron is dissolved in hydrocarbon and introduced into linoleum at 200-300 degrees C. (Ali-Cohen, Dutch patent No. 3,293.)

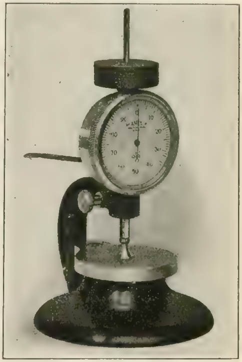
NORWAY.

Treating Vulcanizable Plastic Materials.—Consisting of admixing the vulcanizing agent and subjecting the combination to vacuum. (Rubber Regenerating Co. Norwegian patent No. 29,803.)

LABORATORY APPARATUS.

DIAL GAGE FOR SHEET RUBBER.

A modified form of the customary upright dial gage for sheet rubber is shown in the illustration. The pressure of the disk on the stock is regulated by removable weights on a spindle, instead of by a spring. This feature gives the instrument adaptability in gaging soft stocks and for that reason the gage is finding favor with rubber manufacturers. (B. C. Ames & Co., Waltham, Massachusetts.)



Rubber Thickness Gage.

LABORATORY DISH.

A standardized weighing dish for laboratory purposes has lately been perfected and made the subject of a recent patent. The method of standardization follows:

A standard weight is decided upon for the dish which may be selected by averaging the weight of a number of dishes. Each dish is then very carefully and accurately weighed with the equalizer attached. If the dish is found to be above the standard weight previously selected, the cap of the equalizer stud is ground to remove sufficient metal to bring the weight of the dish exactly to the standard selected. If the weight of the dish is below this standard the cap is removed from the stud and powdered lead placed in the container in sufficient quantity to bring the weight to the standard selected. (Mojonnier Bros. & Co., Chicago, Illinois.)

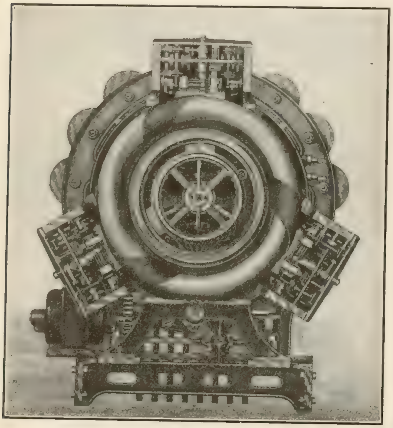
Standardized Weighing Dish.

"Crude Rubber and Compounding Ingredients" and "Rubber Machinery," by Henry C. Pearson, should be in the library of every progressive rubber man.

New Machines and Appliances.

AUTOMATIC CORD TIRE BUILDING MACHINE.

Due to the novel method employed in carcass construction, the production capacity of this machine, it is claimed, will average 25 tires per hour. Moreover, the construction permits the saving of materials that are wasted in ordinary cord tire building processes. The specifications for the tire provide for individual cords tensioned to absolute uniformity throughout the process of twisting the separate strands comprising the cabled cord and in the final cabling thereof. The individual strands are thoroughly impregnated with rubber compound that precludes frictional movement within the body of the cords.



The Dickinson Tire Builder.

The cords are laid on the core in a series of strips made up of a number of parallel cords formed in cross-section to compensate for the variable circumference between the bead and crown, and uniformly covering the full superficial area. The strip-cords are equally distributed on helicoidal lines representing the shortest path between the opposite beads in accord with the angle at which the cords are laid, so that each cord occupies the same relative angular position and bears its full proportion of the stresses and strains of service.

To form the cord strips that give the progressive increased width from bead to crown, the contour of the cord varies from cylindrical to elliptical, but the displacement is accomplished without rupture of the fibers and the original strength is not impaired. All cords are insulated to prevent frictional contact between them in the separate plies and between the cord plies themselves. To eliminate multiple frictional surfaces two plies only are used, as more plies increase the cross-sectional circumference between the first and succeeding plies, amplify frictional action and impose strains on the cords in attempting to meet the constantly changing conditions in the flexing of the tire in service.

The machine is practically automatic in operation, as the operator has only to do with starting, stopping, supplying the necessary material, setting the cores in place and removing them with the finished carcass thereon. The present type machine lays fifteen cords simultaneously in units of five cords each at three points over the core, one hundred and twenty degrees apart, the cords being fed from fifteen reels or bobbins through tensioning apparatus, imparting to each cord a fixed stretch or tension, automatically controlled to insure uniformity. Each unit of five cords is carried through a forming die in which pressure is applied throughout the strip length to obtain the required progressive shape to cover the variable area between bead and crown.

From the die the strip is fed to a swinging arm having grips at each end by which the strips are held under fixed tension. In this position the strip is cut to a predetermined length, in which there is no further trimming, thus obviating waste material. The arm is then swung over the core in position to lay the cord strip at the desired angle over the core. The cord strip is next transferred to laying fingers which carry each end in its path around the core; this path being mechanically regulated, there can be no deviation from it; therefore, each strip occupies the same relative position and the initial tension of the cord has been maintained throughout. Placing the bead then follows, after which the strip ends are brought around the bead toe and under it, the ends presenting a line parallel to the bead toe and heel, midway between them.

Laying the second ply is accomplished in the same manner as the first, the strip ends being laid under the bead heel, abutting the ends of the first ply and parallel thereto, thus providing angular locks, under mold pressure, preventing any slippage of the cords whereby the tension is relieved (Dickinson Cord Tire Corporation, 250 West 54th street, New York City.)

RUBBER BUFFING MACHINE.

Flexible shaft buffing equipment has come into use more recently in tire factories through its utility in removing small imperfections in finished tires, and for eradicating the name and serial number from defective tires.

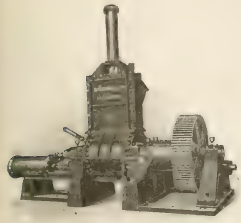
In tire rebuilding and repairing, these machines are invaluable for buffing the inside of the casing to prepare it for the reliner or inside repair. For repairing giant pneumatic tires, buffing tubes, and tool grinding, this portable device is of much practical use.

Flexible Shaft Buffer.

The machine here shown is furnished complete with a ¼-h.-p. motor, 10 feet of cord with plug to attach to the electric lighting socket, five feet of 7/16-inch flexible shafting, grinding wheel, and felt buff. (R. G. Haskins Co., 27 South Desplaines street, Chicago, Illinois.)

IMPROVED AUTOMATIC MILL AND MIXER.

Enclosed, automatic rubber mixers are now accepted as standard equipment in rubber mills. The machine here shown has demonstrated its efficiency in breaking down crude rubber and mixing compounds maximum quantities.



No. 9 Banbury Mixer

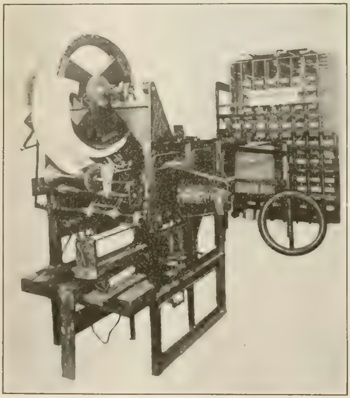
The mixer consists of an enclosed trough, in which operate rotating blades of special construction, both trough and blades being hollowed for cooling and heating purposes. The rubber and compounding ingredients are fed into a hopper and the finished batch is discharged by the turn of a valve, through the door at the bottom of the machine.

A recording thermometer records the temperature of the mix and also shows how many batches are mixed daily, and a timing device indicates by sight or sound when the batch is finished.

These mixers are made in two sizes, No. 3 and No. 9. The former will handle a batch of approximately 150 pounds of 1.5 gravity stock, and the latter, 450 pounds. Individual motor drive is commonly used but the machines may be driven from the mill line. (Birmingham Iron Foundry, Derby, Connecticut.)

COMBINED TIRE BUILDING MACHINE AND LOOM.

This machine makes it possible to begin the construction of a tire carcass on the doubling and twisting machine, where each thread, before becoming a part of a cord, is drawn through



The Schaffer Automatic Tire Builder.

rubber solution and impregnated, insuring a thorough distribution of rubber throughout the fabric, thus contributing largely to the elimination of one of the troubles that usually cause separation of the plies, internal friction and blow-outs.

After being rubberized, the threads are ingeniously woven on a magnetically operated loom and formed into a fabric on a double curve to approximate closely the final position of the fabric in the tire, as regards curve of the walls and circumference of the tire.

The saturated threads are then passed over electrically warmed pads that make them soft and sticky, when the skim-coat rubber is fed between the rolls and adheres to the warmed rubber of the plies, welding them closely together and insuring the expulsion of air.

The carcass made by this machine is unique in that it does away with all laps or joints. There is one continuous ply from start to finish, in which the distribution of warp threads may be regulated to give varying strengths for first ply, bead section, etc. The fabric contains one starting and one finishing end, with no waste of fabric, there is no trimming, and but little auxiliary stitching.

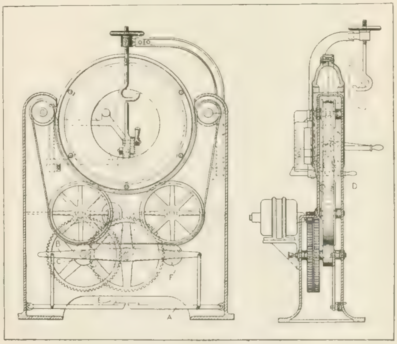
These machines will make tires up to 34 by 4 inches, with a capacity of two tires per hour, it being assumed that one man will be able to take care of eight machines and thus turn out sixteen tires per hour. (Automatic Tire Machine Corporation, Buffalo, New York.)

MACHINERY PATENTS.

MACHINE FOR BUILDING CASINGS AND TUBES.

This machine is provided with a rotatable annular channel-shaped form within which the tire casing or tube is built. Two annular portions secured together and arranged to be separated after the tire is built permit the removal of the tire from the form; a stitching device stretches the material from which the casings are formed, as it is placed within the form and shapes the tire casing.

The tread portion and side walls of the casing are first placed



Banner Tire Builder.

within the form after which the breaker strip is placed upon the tread or if desired the breaker strip may be applied to the tread before placing in the form. The form is preferably operated at a slow speed by depressing the treadle *A*, rocking the lever *B* into position to move friction roller *C* into engagement with the belt, and thus slowly rotating the form.

The fabric or cord is then placed within the form, and the stitching wheel *D* operated to press the fabric within the side walls and tread portion of the tire. The cushion strip being

placed in the form, the inner plies of cord or fabric are then stitched upon the inner surface of the tire.

If it is desired to operate the form at a comparatively fast rate of speed, the treadle *E* is depressed, moving the friction roller *C* out of engagement with the belt and throwing the friction roller *F* into engagement with the belt.

These inner cords or fabric may be composed of any desired number of layers according to the size or type of tire to be built, The beads are then placed in their proper position and the remainder of the cord or fabric plies placed over the beads and stitched in place by the stitching wheel.

After the tire is thus built up the form is separated and the tire removed and finished by vulcanization in the usual manner. (William R. Major and Frank H. Grove, assignors to the Banner Machine Co., Columbiana, Ohio, United States patent No. 1,343,399.)

OTHER MACHINERY PATENTS.

THE UNITED STATES.

No. 1,342,646. Rubber core tensioning mechanism for braiding machines. F. W. Plumb, assignor of Narrow Fabric Co.—both of Wyomissing, Pa.
1,342,916. Repair vulcanizer. S. Kenchen, New Haven, Conn.
1,342,970. Last for rubber boots. R. B. Price, New York City, assignor to The Goodyear's Metallic Rubber Shoe Co., Naugatuck, Conn.
1,343,121. Flexible coupling for adjacent ends of shafts. W. J. Francke, assignor to The Francke Co.—both of Highland Park, N. J.
1,343,377. Apparatus for treating vulcanizable rubber in sheets to reduce shrinkage. J. J. Shea, assignor to The Hartford Rubber Works Co.—both of Hartford, Conn.
1,343,413. Flexible coupling device with interposed floating ring, etc. R. A. Smith, Mahwah, and J. J. Sorrell, Elizabeth, assignors to Smith & Sorrell, Mahwah, a copartnership—all in New Jersey.
1,343,425. Mold for mechanical goods. C. P. Whisler, assignor to The Miller Rubber Co.—both of Akron, O.
1,343,460. Apparatus for opening tire molds, etc. Colin Macbeth, Birmingham, assignor to the Dunlop Rubber Co., Limited, Westminster—both in England.
1,343,504. Collapsible core for tires. A. H. Harris, Barberton, O.
1,344,313. Expanding core for tires. O. A. Peterson and O. M. Brancel, Minneapolis, Minn.
1,344,702. Mandrel for making inner tubes for pneumatic tires. F. R. McCarty, Erie, Pa.
1,344,838. Tire repair tool. C. Wieland, Yankton, S. D.
1,344,847. Repair vulcanizer for tire side walls. J. W. Arthur, assignor to The Williams Foundry & Machine Co.—both of Akron, O.

REISSUES.

14,879. Apparatus for manufacturing tires or inner liners. W. F. Ray, Chicago, Ill. (Original No. 1,292,052, dated January 21, 1919.)

THE DOMINION OF CANADA.

200,584. Device for securing couplings to flexible hose. J. R. Ruse, Spencer, W. Va., U. S. A.
200,666. Expansible core for tires. E. A. Krannich, Chicago Heights, Ill., and L. A. Andregg, Mansfield, O., each an assignee of ½ interest, both in the U. S. A.
200,687. Apparatus to resole rubber boots. J. Anctil and J. O. Landry, coinventors, both of Montreal, Que.
200,860. Tire vulcanizing press. The Dunlop Rubber Co., Limited, Westminster, County of London, assignee of Colin Macbeth and H. Willshaw, Birmingham, County of Warwick—all in England.
200,863. Apparatus for vulcanizing tires. Firestone Tire & Rubber Co., assignee of C. A. Myers—both of Akron, O.
201,157. Repair vulcanizer. E. Fetter, Baltimore, Md., U. S. A.
201,259. Pneumatic shoe press. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of C. J. Stuart, New Haven, Conn.
201,463. Machine for making pneumatic tire covers or casings. The Dunlop Rubber Co., Limited, Westminster, County of London, assignee of Colin Macbeth and C. K. Jones, Birmingham, County of Warwick—all in England.

THE UNITED KINGDOM.

138,915. Apparatus for treating rubber for removal of moisture. Hunter Dry Kiln Co., 2571 Cornell avenue, assignee of H. Hunter, 2802 Ashland avenue—both of Indianapolis, Ind., U. S. A. (Not yet accepted.)
141,210. Apparatus for recovering volatile solvents, especially in the rubber industry. D. V. Plumbridge, Holmewood, South Kilworth, near Rugby, Warwickshire.
141,421. Apparatus for drilling, turning, or analogously treating studs for pneumatic tires, etc. B. Clews, 37A, Agamemnon Road, West Hampstead, and H. M. Petersen, 46 King's Road, Willesden Green—both in London.
142,368. Apparatus for making pneumatic tires. E. Hopkinson, 1790 Broadway, New York City, U. S. A.

GERMANY.

324,972. Apparatus to cut out rubber heels, soles, and strips for shoes and other rubber articles. Wood-Milne, Limited, Gaythorn, Manchester, England.

PROCESS PATENTS.

THE UNITED STATES.

No. 1,344,503. Manufacture of composite soles for boots or shoes, having cord fabric incorporated therein, with ends of cords presented to wearing surface. J. E. Grosjean, Lima, assignor by direct and mesne assignment of ¼ each to L. F. Montgomery, Fort Recovery, and F. L. Maire, Lima—all in Ohio.

MACHINES FOR VARNISHING AND VULCANIZING AUTO TOP FABRICS.

In the manufacture of auto top fabrics the success of the final varnishing and curing processes is largely dependent on certain machines of special design and construction.

Double texture fabric is not varnished and is not sticky and when ready to be cured, the festooning machine shown in Fig. 1 is utilized. This is shifted in front of the vulcanizer and two rolls of double-texture fabric are placed in the machine which delivers the sheets, one upon the other, in festoons into the heater.

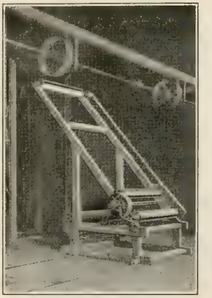


Fig. 1. Double Texture Fabric Festooning Machine.

Single texture fabrics are first calendered or coated on a spreader and then varnished and cured, the two latter operations being performed on the apparatus shown in Fig. 2. This machine takes the fabric from the roll, varnishes it and delivers it into the heater in festoons of single sheets. (Cyrus Currier & Sons, Newark, New Jersey.)

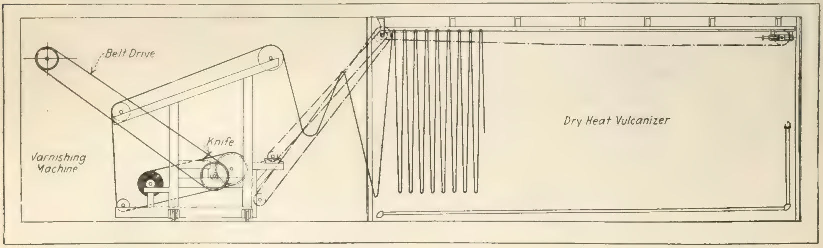


Fig. 2. Single Texture Fabric Varnishing and Festooning Machine and Dry Heat Vulcanizer.

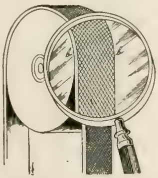
New Goods and Specialties.

LATE AUTOMOBILE FAN BELTS.

The development of the automobile business has apparently resulted in multiplying the number of accessories on the market, and many of these employ rubber in some form in their composition or construction. The automobile fan belt often is in this class and two of the late types are illustrated herewith. The upper one is the newer of the two and is an endless V-belt made like a cord tire, molded to fit the pulley, thereby minimizing the tendency to slip. The cross-sectional view shows the construction of this belt, which is made in standard sizes to fit passenger cars, trucks, or tractors.

"Vulco-Cord" V-Fan-Belt.

The picture below shows a magnified view of a section of a bias-woven fan belt. Being woven on the bias makes it elastic and gives it a firm grip on the fan pulley, assuring the user of its always remaining tight. This belt is made under a United States patent granted to Charles C. Gates, the inventor, for what is known as the "Vulco-Cord" process. (Gates Rubber Co., Denver, Colorado.)



"Vulco-Cord" Bias Belt

THE "EVERLOC" HOUSEHOLD PATCH.

A patch that will mend the ordinary articles of fabric, leather, or rubber, such as rubber shoes, automobile tops or tires, footballs, umbrellas, etc., is called the "Everloc." In addition, there is a cobbler kit containing self-vulcanizing patch material in a strip. (Everloc Sales Co., Minneapolis, Minnesota.)

THE "BIG" AND THE "LITTLE" IN MOTOR TRUCK TIRES.

The big tire shown here is the "Samson," 40 by 12 inches, weight approximately 400 pounds, believed to be the largest solid motor truck tire ever made in Canada. The smaller one is a 3½-inch tire, shown for the sake of comparison. It is claimed that the 12-inch tire contains a greater proportionate volume of rubber than any other and that it is exempt from such troubles as splitting and coming loose from the steel base. Some idea of the tremendous undertaking involved in manufacturing a tire of this size can be gained from the fact that the mold equipment necessary to handle it weighs approximately two tons. While the manufacturer will continue to make the 6 and 7-inch dual tires, it is sure that better service is obtained from the use of single "Samsons," because what is practically combining the duals into one single broad tire offers greater cushioning and carrying capacity. The 12-inch "Samson" will carry a load of 10,000 pounds as against an 8,000-load for the 6-inch dual, while the 7-inch dual carries the same, 10,000 pounds. The company will next produce a 14-inch "Samson." (Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ontario, Canada.)

Big and Little "Samsons."

GOGGLES TO GUARD AGAINST DUST AND POWDERS.

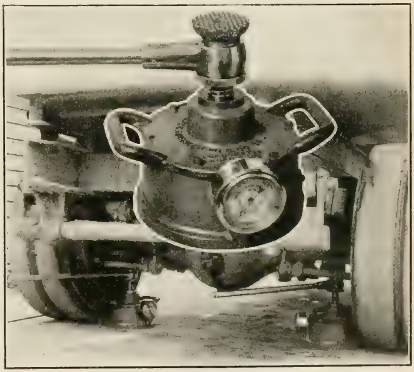
The King "Dustsafe" C goggle is designed to protect against dust and powders. The rigid aluminum cups are bound with rubber composition, as is also the connecting chain. The C. model has ventilating side ports and elastic straps for adjusting and fastening. (The F. W. King Optical Co., Cleveland, Ohio.)

The King "Dustsafe" C Goggle.

A METER TO MEASURE TRUCK LOADS.

To prevent overloading, with consequent damage to motor trucks, tires and especially to the highways, the Loadometer has been invented. It is a portable instrument having a screw jack mounted on its plunger. The base of the instrument is an oil-filled cylinder in which the plunger operates, and the weight carried by the plunger is indicated on a high-pressure gage connected to the oil chamber.

By placing a pair of Loadometers under the rear axle of a truck where the greatest weight is carried and jacking up the rear wheels clear of the ground, the maximum load per inch of tire width is easily determined. The jack handles can be readily detached from the instrument so that a pair of Loadometers can be easily carried about in a small automobile. County and state road commissioners are using these devices extensively to prevent abuse of improved roads. (The Black & Decker Manufacturing Co., Baltimore, Maryland.)



The B. & D. Loadometer.

The "SlaPatch" for large blow-outs, has live rubber self-adhering surface which holds patch to inside of tire casing and double weight canvas back, while canvas flaps fit under rim. (The Wilson Rubber Co., Des Moines, Iowa.)

RUBBER BLOOMERS FOR CHILDREN.

The "Everychild" wading bloomer is a recent product on the market. It is made of good heavy rubber stock, in three fast colors—blue, red, and green, in three sizes—small, medium, and large, for children from three to ten years of age. Elastic is cemented within the hems at the waist and legs so that there is no bother with strings and buttons—something both children and mothers will appreciate. The garment is well shaped, being made in two pieces, with cemented seams, and is decidedly good looking, due to the excellent grade of rubber used in its manufacture. The "Everychild" bloomer may be slipped on over the child's clothes, thus forming a needed protection, whether in playing or wading. The child thus clothed may sit on the beach in the sand without danger of a wetting if a wave creeps up suddenly. One of the advantages of this bloomer is that it requires no washing except dipping in clear water. (Arthur Frankenstein & Co., 514-516 Broadway, New York City.)

"Everychild" Rubber Wading Bloomer.

"SUPER PATCH RUBBER-TITE" TUBE REPAIR OUTFIT.

An outfit for repairing inner tubes includes patches of high-grade, properly cured red rubber, to which is added a cloth protector, and a tube of cement, all contained in a small can with a screw-top. It is claimed for this patch that it cannot leak, will not creep, and stretches with the tube. (The Polson Rubber Co., Cleveland, Ohio.)

"WISCO" ATHLETIC SHOES.

The shoe shown here, intended for wear by basket-ball players, is made on the "Wisco Turnwelt" principle, which affords great flexibility and extremely light weight for a shoe of its kind. The uppers are of the finest black calf. The notable feature is the soft and pliable fiber-rubber vacuum suction-cup sole, which prevents slipping on a polished floor. The shoe protects the ankle and laces from the toe up. The sizes range from 5 to 11.

"Wisco" Basket-Ball Shoe.

The indoor running shoe, also illustrated, has the best quality corrugated rubber tap sole, with light kangaroo horse uppers, cut under at the heel to secure a snug fit. The sizes run from 3 to 11. Both of these styles of athletic shoes are made by the same concern, and, like its other goods marked with the "Wisco" trademark, are guaranteed to give satisfaction and reasonable service when used for the purpose for which they are intended under the ordinary conditions and with fair treatment by the wearer. (Wisconsin Shoe Company, Milwaukee, Wisconsin.)

"Wisco" Indoor Track Shoe.

THE "LOCKTITE" PATCHER.

Already a part of the standard equipment on a large number of cars, the "Locktite Auto-New-Matic" patcher seems to fill a long-felt need. Patching inner tubes by this method is claimed to be superior to ordinary ways of mending tubes on flat surfaces, as the tube is held and the edges of punctures, cuts, and blow-outs are prevented from curling under and wrinkling. An illustrated instruction sheet accompanies the device and gives simple directions. (Locktite Patch Co., Detroit, Michigan.)

"Auto-New-Matic" Inner Tube Patcher.

HICKORY GARTERS FOR CHILDREN.

The Hickory garter is made with a body of fine mercerized sateen with straps across the front and back to hold it in place, while the garters themselves are attached to the belt at the bottom of the body part. The garters have a patented rubber cushion loop which saves wear on hosiery, and the webbing and elastic are of excellent quality. (A. Stein & Co., New York City and Chicago.)

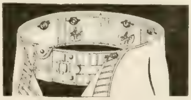
SKOOTER ON RUBBER-CUSHIONED TRUCKS.

The "Brownie" skooter for children has a strong 20-inch footboard mounted on four ball-bearing skate wheels carried on rubber-cushioned trucks, and is guided by a 24-inch handle conveniently placed. The toy is painted bright red and comes packed by the dozen in corrugated fiber cases. Extra parts, including the rubber cushions for the trucks, may be ordered separately, as needed. (F. D. Kees Manufacturing Co., Inc., Beatrice, Nebraska.)

"Brownie" Skooter.

TROUSER SUPPORTER UTILIZES RUBBER.

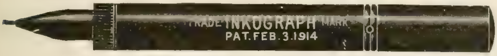
The Faust trouser supporter, made from 26 to 44 inches long and from 4 to 8 inches wide, fastens with flat buttons and reinforced buttonholes, while rubber "finger" pads hold the shirt down. The belt strap is adjustable and there is an invisible leather money-pocket. The wide sizes are designed especially for stout men. (Faust Manufacturing Co., Chicago, Illinois.)



Faust Trouser Supporter.

THE "INKOGRAPH."

An ink pencil with a one-year guaranty is an article sure to



An Ink-Pencil with Rubber Plug.

interest the many who rely upon pencils and fountain pens. Its points of superiority are as follows: (1) three or four carbon copies may be made at once; (2) lines may be drawn with a ruler without blotting and blurring; (3) the smooth, hard, round gold point will not break or bend; (4) it can be carried in any position without danger of leakage; (5) it is ready for instant use the moment the cap is taken off.

The "Inkograph" is made in many different styles, for a wide range of prices. The latest model has a rubber plug inside the cap which prevents leaking while upside down. (Inkograph Co., Inc., 670 Sixth avenue, New York City.)

CARPET WASHER WITH RUBBER BRUSHES.

A new washer for rugs and carpets is shown in the accompanying illustration, which makes it no longer necessary to remove them from the floor in order to have them perfectly clean and sanitary. The "Hamilton Beach" carpet washer is a combination of washing machine and vacuum cleaner, equipped with two rubber brushes that oscillate 500 times a minute, duplicating the action of the human hand perfectly, it is claimed, only in a more thorough manner. No water touches the rug or carpet, however. Only the warm, sudsy cleaning compound is scrubbed down to the bottom of the nap in so thorough a manner that every thread is cleaned. The dirt is removed by the powerful suction, simultaneously with all moisture. The soap compound intended to be used with this carpet washer is said to contain no harmful chemicals or animal fats, being based on a vegetable oil that leaves the carpet sweet-smelling and sanitary. (Hamilton Beach Carpet Washer Co., 114 Liberty street, New York.)

Hamilton Beach Carpet Washer.

REPAIR TOOL FOR DIVERSE USES.

The Schrader "Universal Five-in-One" valve repair tool, it is claimed, performs three repair and two utility operations namely: (1) repairs the inside thread on valve and (2) the outside thread on valve stem for valve cap; (3) smooths down valve-cap washer seat on valve; (4) removes or inserts valve inside; (5) deflates tube by holding down valve inside, by screwing deflater into mouth of valve. These valve-repair tools are put up ten to a counter display board, with easel back for convenience in displaying. (A. Schrader's Son, Inc., 783 Atlantic avenue, Brooklyn, New York.)

Schrader Valve Tool.

THE "ALLWEATHER" AUTOMOBILE TOP.

A handsome custom built automobile top for individual cars is called the "Allweather." The frame is of hard wood, reinforced with sheet steel, padded with felt. The side panels are of clear glass set solidly into hard-wood frames covered with material to match the waterproof topping. The glass is held in place by a leak-proof rubber compound. The side panels may be removed, frame and all, for summer driving. Curtains with celluloid windows are provided as a substitute, and these may be folded and carried under the seat of the automobile. The curtains also match the top material. (The Allweather Top & Body Co., Inc., 6545 Carnegie avenue, Cleveland, Ohio.)

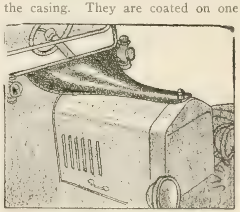
"Easy-Rest" Cushion.

PRACTICAL AUTOMOBILE ACCESSORIES.

An excellent wedge-shaped back cushion, for use by women automobile drivers or persons of small stature, is made of heavy 32-ounce rubberized fabric with a black enamel finish. It is stuffed with a high-grade sea moss which does not pack hard or get lumpy, because tufts are sewed in nine places with black upholstering buttons, to help preserve the shape. The maker claims that the "Easy-Rest" cushion shown in the illustration above retains its resiliency indefinitely.

The same manufacturer is putting out the "Wear-Ever" leather reliners for tires, prepared on regular tire forms, shaped to fit the inside curve of the casing. They are coated on one side with a heavy layer of rubber cement that is moistened with gasoline when applying the reliner to the tire casing.

Another specialty of this manufacturer is a rain guard to cover the crack between the hood cover and cowl on a Ford automobile. It is made of durable rubberized duck and prevents moisture running down to the wires. The back fastens under the wind shield with nickel-plated snaps and the front over the radiator top, while two straps hold the sides snugly. The guard is easily removed when not required for use. (A. J. Stephens Rubber Co., Kansas City, Missouri.)



"Stephens" Rain Guard for Fords.

THE EDITOR'S BOOK TABLE.

"EXPORTER'S GAZETTEER OF FOREIGN MARKETS." 1920-1921. Compiled and edited by Lloyd R. Morris, editor of "The American Exporter," New York City. The Johnston Export Publishing Co., New York City. (Cloth, 6 by 9 inches, 766 pages.)

THIS BOOK is prepared with the object of providing in readily accessible torm facts about the world's markets which may be used for reference by the American business man concerned with foreign trade.

The countries of the world are listed alphabetically by continents; units of currency, measurement, capacity and weight are converted into units commonly understood by Americans; maps of the different countries are provided, along with information regarding area, population, commerce, production, industry, railroads, telegraphs, telephones, money, weights, measures, commercial language, principal shipping routes, customs tariff, consular regulations and representation, cable rates, mail time, postal rates, regulations with respect to parcel post, money orders and reply coupons, and other statistics. Supplementary tables and a complete index are given at the close of the book.

NEW TRADE PUBLICATIONS.

THE CAMERON MACHINE CO., 57-61 POPLAR STREET, BROOKLYN, New York, is issuing to its friends neatly framed illustrations of the various types of slitting and rewinding machines, made by this company for the rubber trade; and also views, both exterior and interior, of its well-equipped plant in Brooklyn.

PORTABLE MACHINERY CO., PASSAIC, NEW JERSEY, HAS JUST PUBlished a 24-page catalog entitled, "Portable Conveyors," complete with illustrations showing the various uses of the scoop conveyor and other portable conveyors manufactured by this company. The catalog describes clearly the labor, time and money saving features of the machines in storing, reclaiming, loading and unloading material, such as coal, coke, ashes, sand, gravel, crushed stone, fertilizer, cement, chemical, etc.

THE RUSSELL MANUFACTURING CO., MIDDLETOWN, CONNECTIcut, issues a neat booklet describing the "Rusco" products. Since its organization in 1830 by the great-grandfather of the present president, the company has grown from one mill to thirty-eight, with a floor space of 450,000 square feet. Some of the goods manufactured to-day are: brake linings, cone and disk clutch facings, fan belts, tire straps, anti-squeak webbing and hand lacings.

THE "TWENTIETH YEAR BOOK AND ANNUAL REPORTS," OF THE Rubber Association of America, Inc., is just off the press. It was prepared by the general manager and secretary, and contains a list of the officers and committees of the association proper, and of the various divisions.

A membership list is included, along with photographs and other matters of interest to the members of The Rubber Association.

THE NATIONAL INDIA RUBBER CO.'S NEW FACTORY JOURNAL, "Keds Live Wire," the name embracing the shoe and wire departments, made its initial appearance at Bristol, Rhode Island, on Saturday, June 26, and was a very creditable and breezy paper. It is to be issued weekly on Thursday for distribution among the employes of the concern. Frank Damrosch, Jr., has been appointed editor; Francis J. McIsaac, sporting editor; John T. Ashton, photographer; Pietro Vaccaro, Italian translator, and Anthony Alfred, Portugese translator. There will be a reporter for each room and the paper will include all items of interest in and about the factory.

"CURRENT DIFFICULTIES IN DOMESTIC DISTRIBUTION" WAS THE subject of an important address by W. O. Rutherford, general sales manager of The B. F. Goodrich Rubber Co., Akron, Ohio, before one of the group meetings at the annual convention of the Chamber of Commerce of the United States at Atlantic City, New Jersey. In it he discussed the condition of American business, with pertinent comment and constructive suggestions regarding transportation by rail and motor truck, factory production, labor conditions, finances, individual and industrial economics and the circle of rising costs. Although money is the controlling factor in the situation, he concludes that we are suffering more from mental than financial instability and that there is nothing seriously wrong with the country.

INTERESTING LETTERS FROM OUR READERS.

FROM AN AGED FATHER.

TO THE EDITOR.

DEAR SIR:

I want to locate the address of my son, Alfred Dunn, who I am told, is a superintendent of a rubber company about 45 miles from San Francisco, California.

If you can give me any information how I can locate him, I will be much obliged.

I. R. DUNN.

Aged Men's Home,
51 Belmont street,
Toronto, Canada.

A DEFENSE OF THE FILIPINOS.

TO THE EDITOR:

DEAR SIR:—Allow me to make some comments upon your editorial of last month entitled "'A Setback to Filipino Progress."

While everybody is entitled to his own opinion, I do believe that it is not fair to state that the act of the Philippine Government in refusing to amend the laws that limit the extension of land that can be acquired by a company and that prohibiting the importation of Chinese laborers, is a crass folly; and it is the height of unfairness to say that this action shows the absolute incapacity of the Filipinos for self-government.

Similar laws are enforced in some states of the Union, among them California, and we doubt your readiness to brand these states as incapable for self-government. The Government of the United States is really responsible for the exclusion of Chinese laborers from the Philippine Islands. The laws limiting the extension of land that can be acquired by any corporation have been dictated by a wise sense of national protection and according to one of your own contributors, Lieutenant Colonel H. F. Cameron, of the Engineers Corps of the United States Army in an article published in the same issue where your editorial appears, "these laws were framed by an early American administration."

Furthermore, Colonel Cameron states that: "The Philippine Government has under serious consideration the necessary law changes to permit large responsible industrials to operate. Understanding the present situation as outlined above, it is believed that capital with faith and courage in the Philippine Government may take the maximum land area allowed by present laws and develop, using Filipino labor, with an assurance that amended laws will soon permit this operation to expand on as favorable a business basis as now pertains to the rubber-producing Dutch Netherlands and British Colonies of the Far East."

ARSENIO N. LUZ, Manager,
Philippine Commercial Agency.

Grand Central Palace,
New York City.

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

(811.) A correspondent desires to know the best commercial method of finding the percentage of lead hydrates and lead carbonates in ordinary white lead.

(812.) A correspondent wishes to know address of owner of patent on or manufacturer of a machine for forming rubber balls, toys, etc., before they go into the molds.

(813.) A request is made for the addresses of manufacturers of brass fittings for rubber bath and basin stoppers.

(814.) The name and address of the manufacturer of the "Sorelle" rubber heel is desired.

(815.) A correspondent wishes to obtain the names and addresses of the concerns making machines for the manufacture of small hose.

(816.) Directions for making a dipping solution for toy balloons are desired.

(817.) The name of the manufacturer of the Daisy milk bottle stopper is requested.

(818.) A foreign correspondent wishes address of reputable manufacturer who will make reservoir sacks for self-filling fountain-pens strictly according to specifications.

(819.) Inquiry is made by a foreign correspondent for the names of any firms manufacturing a machine for rolling finger cots.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Requests for each address should be on a separate sheet, and state number.

District Offices.	Cooperative Offices.
New York: 734 Customhouse.	Cleveland: Chamber of Commerce.
Boston: 1801 Customhouse.	Cincinnati: Chamber of Commerce; General Freight Agent, Southern Railway, 96 Ingalls Building.
Chicago: 504 Federal Building	Los Angeles: Chamber of Commerce.
St. Louis: 402 Third National Bank Building.	Philadelphia: Chamber of Commerce.
New Orleans: 1020 Hibernia Bank Building.	Portland, Oregon: Chamber of Commerce.
San Francisco: 307 Customhouse.	Dayton, Ohio: Dayton Chamber of Commerce.
Seattle: 848 Henry Building.	

(33,137.) A firm in South Africa desires to purchase machinery for the manufacture of tires and tubes. Quotations c. i, f. South African ports.

(33,149.) A trading company in Argentina desires the exclusive agency for the sale of rubber belting. Quotations by mail or cable c. i. f. Argentine port.

(33,170.) A company in Norway wishes an agency for the sale of rubber and rubber goods. Quotations c. i. f. Norwegian port. Payment through banks in Norway and New York.

(33,211.) A manufacturer's agent in Australia desires an agency for the sale of all kinds of rubber goods, except tires.

(33,218.) A company in Danzig desires exclusive agency for motor cars and cycles, as well as tires. Quotations c. i. f. Danzig in United States currency. Correspondence in German.

(33,224.) A firm of engineers and merchants in Wales wishes agency for sale of motor tires and rubber goods. Quotations c. i. f. English ports.

(33,254.) A commercial agent in Bulgaria wishes agency for sale of fine quality raincoats. Quotations c. i. f. port of Varna. Correspondence in French.

(33,255.) A commercial representative from Colombia who is now in the United States wishes to secure an agency for sale in Colombia of rubber goods.

(33,261.) A merchant in Norway desires to purchase five tons of washed Pará rubber. Quotations c. i. f. Bergen.

(33,277.) A surgical supply company in Canada wishes to purchase elastic webbing. Quotations f. o. b. shipping port. Cash payment.

(33,280.) A commercial agent in Italy wishes to secure representation of firm for sale of rubber goods. Correspondence may be in English.

(32,924.) A trading firm in Australia desires an agency for motor accessories. Quotations c. i. f. Australian port.

(32,927.) An import firm in Ceylon wishes to purchase motor cars and motor accessories. Quotations c. i. f. Ceylon.

(33,306.) A commercial agency firm in Brazil desires an agency for the sale of automobiles, supplies, and rubber goods. Quotations c. i. f. Brazilian ports and f. o. b. American ports. Correspondence may be in English.

A HAND-POWER STUMP PULLER

Clearing land for rubber planting involves the removal of stumps and therefore a stump puller that is already in use on rubber plantations in the Far East, will be of more than passing interest.

This hand-power puller, as its name indicates, is operated by hand with either one or two men, and its light weight makes it readily portable to any point where it may be

The "K" Power Puller at Work.

needed. The simplicity of construction and operation is such that any one, even of the most ordinary intelligence, can use it with a few minutes' instruction. With a hundred pounds' pressure on the handle, the machine will develop a pull of 48 tons, which is more than two large tractors or one compound locomotive will develop. It can be carried into position by two men or wheeled about by one, and works equally well in the air or on the ground. (The Fitzpatrick Products Corporation, 99 John street, New York City.)

RESISTANCE OF RUBBER OBTAINED BY COAGULATION OF LATEX.

By coagulating latex with sulphuric acid in the presence of phenol it is possible to obtain sheets of raw rubber of surprising strength and elasticity, the breaking strength being 190 grams per square milimeter and the permanent set small. After heating for 20 minutes at 100 degrees C. the extensibility and permanent set are greater but the breaking strength is unaffected; heating for 4 hours at 110 degrees C., however, causes the rubber to become very weak and plastic. If strips of the rubber are vulcanized in the sulphur bath at 135 to 140 degrees C., a very elastic product is obtained with a breaking strength of 666 grams per square milimeter.—V. Henri, in *"La Caoutchouc et la Gutta-Percha,"* 1920, 17, pages 10196-10202.

Summer Outing of The Rubber Association of America.

GEDNEY FARMS HOTEL, WHITE PLAINS, NEW YORK.

FAIR WEATHER greeted the three hundred and fifty rubber men and their guests on Wednesday, July 28, at Gedney Farms Hotel, near White Plains, New York, where the Nineteenth Annual Summer Outing of The Rubber Association of America was held.

Easily accessible from New York City by train or motor, Gedney Farms, with its comfortable modern hotel, beautiful country surroundings, and every facility for sport and recreation, is an ideal spot for a summer outing.

The members and guests commenced to arrive by train or motor as early as 10 o'clock and soon the hotel lobby was filled with a jolly crowd of rubber men who had forgotten business in a day's outing where good fellowship reigned supreme.

Among the first on the grounds were the golfers, who took possession of the 19-hole golf course and the club house, situated on a shady knoll not far from the hotel proper, and providing every comfort and convenience of a first-class country club. With clear skies and a cool breeze, the ball was driven from the first tee promptly on time and the golf tournament was on.

The contestants in the tennis tournament were on hand early, also, and occupied the excellent courts adjacent to the hotel. With an entry field of some 25 in the singles and 8 teams in the doubles the day was hardly long enough for the elimination contests in singles and doubles and the playing of the prize-winning finish.

Impromptu contests were soon in progress in the bowling alleys where picked teams representing rubber manufacturers and importers contended for the satisfaction of beating the other fellows.

The knights of the cue took possession of the billiard room, where match games of billiards and pocket billiards afforded amusement for the devotees of these sports. The adviser-general was W. G. Kelly, of Poel & Kelly, credited with the invention of kelly pool.

During the heat of the day the swimming pool was well patronized by those aquatically inclined and in the afternoon a water polo match between picked teams afforded amusement for the players and interested spectators.

Between 1 and 2 p. m. an excellent luncheon was served in the hotel dining hall, accompanied by the latest music and popular songs, led by an efficient jazz band.

THE TENNIS TOURNAMENT.

In the inter-firm doubles, the plan of a team of players representing firm members was not followed and the players teamed up as they entered the courts. After the eliminations, the finals were played by the following teams: S. H. Johnson, of J. H. Lane & Co., and H. G. Smith, of the United States Rubber Co., vs. D. S. Kubie, of Raw Products Co., and H. P. Farrington, of Pennisular Trading Agency. The score was 6-3, 6-4, the former team winning the first prize, two gold-mounted leather pocket books, and the second prize, two silver-mounted belts, went to the latter team. E. H. Baker, of W. H. Bass & Co., won the ten-

MEMBERS AND GUESTS OF THE RUBBER ASSOCIATION AT THE SUMMER OUTING AT GEDNEY FARMS.

nis singles from H. G. Smith, of the United States Tire Co., score 6-3, 6-4, whereby Mr Baker won a leg on the perpetual challenge cup, donated by The Rubber Association, to be won

The Banquet Hall.

three times, and a gold-mounted pocketbook. The second prize, a silver-buckled belt, went to Mr. Smith.

Aeroview of Gedney Farms.

THE GOLF TOURNAMENT.

The golf committee had arranged a handicap play golf tournament open only to members of the Association with prizes for the low gross, first low net, and second low net scores. The

Hotel Lobby.

entries were divided into Class "A" and class "B", according to handicaps, two distinct contests for members being held.

In Class "A" the prize for the low gross score, a leather golf-bag, was won by G. G. Yule, of the Falls Rubber Co., Cuyahoga Falls, Ohio, with a score of 79. A mantel clock, the prize for the first low net score, was won by W. E. Kavenaugh, of the Plymouth Rubber Co., Canton, Mass., with the following score: Gross 93, handicap 20, net 73. E. H. Sprague, of the Sprague Tire & Rubber Co., Omaha, Neb., won two thermos bottles with the second low net score of 86 gross, 10 handicap, 76 net

The Swimming Pool.

In Class "B", A. D. Lown won a leather golf-bag with the low gross score of 103. The first low net prize, a smoking set, went to E. P. Gwillim; score 103 gross, 26 handicap, 77 net. H. Hardenburgh was the second low net man, scoring 103 gross, 23 handicap, 80 net, and won a dozen golf balls.

In the special contest for guests, a cocktail shaker, the prize

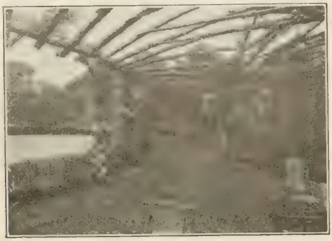
The Golf Course.

for the low net score was won by A. E. Betteridge, who scored 82 gross, 8 handicap, 74 net.

The putting was open to everyone and the first prize, a leather pocket cocktail case, went to F. A. Goddard, of the Sterling Tire Corporation, Rutherford, N. J. D. A. Paterson, of Balfour-Williamson & Co., and P. E. Young were tied for the second prize, a silk umbrella. Mr. Young won on the toss.

THE BASEBALL GAME.

An impromptu ball game was arranged between teams representing rubber manufacturers and rubber importers, umpired by



OVERLOOKING THE TENNIS COURTS.

H. W. Jenkins, of the New York Insulated Wire Co. The battery for the manufacturers was: Flint, pitcher, and Scranton, catcher. Utley and Millenthal pitched and Bouton caught for the importers. The score was 9 to 7 in favor of the manufacturers.

It was a tired and hungry, but happy, crowd that took places in the banquet hall for the final entertainment of the day. The menu was excellent, and the informal character of the dinner, accompanied by jazzy music and chorus singing, inspired a happy mood in everyone. The time for leaving came too soon and members and guests, after the usual friendly salutations, departed for home, while the orchestra played appropriate music in the Italian garden in front of the hotel.

The unqualified success of the outing was due to the efficient

THE HOTEL TEA GARDEN.

work of the outing committee: A. H. Brown, George A. Ludington and W. O. Neil; the sub-committee, A. H. Brown and R. L. Chipman for golf; and Roger S. Hardy and Harold French for tennis; and General Manager Viles and his competent assistants.

ACTIVITIES OF THE RUBBER ASSOCIATION OF AMERICA.

BULLETINS.

THE SUBJECTS relating to industrial relations covered by bulletins sent to members of the association last month include: "Wages and Output," "Two Successful Profit Sharing Plans," "Women Workers in Five Major Industries," "Incompetence the Leading Cause in Business Failures," "Wage Increases in the United States and in Great Britain," and "A Successful Small Hospital Plan."

WAGES AND OUTPUT.

It is frequently asserted that to increase wages is a sure way to secure increased output. That there is a point at which even so strong an influence as a money incentive may not be able to overcome technical conditions in production—a point of diminishing returns beyond which increased wages do not result in proportional increased production—is usually not recognized. For this reason wage and output data obtained in the course of the National Industrial Conference Board's investigations of the hours of work problem are of interest. The Board found that increased wages did not, except in some cases, result in increased output, and that on the whole no definite relationship between wages and changes in output could be traced.

SMALL HOSPITAL PLAN.

That first aid hospital service is a success in a plant of three to four hundred employes, has been demonstrated by the Essex Rubber Co., of Trenton, New Jersey. The management states that, aside from the excellent medical assistance taken advantage of by the workers at the plant, the reduction in liability insurance premium for one year, as a result of installing this service, offset the cost of the equipment.

It is not the purpose to render any aid that should properly be subject to the attention of a physician, and it is necessary that this phase of the service should be in accordance with the State laws. An efficient nurse, and assistant, capable of administering first aid, keep closely in touch with the factory workers and report to the management each month—an example follows:

REPORT OF FIRST AID WORK FOR MONTH ENDED JUNE 30, 1920.

MEDICAL CASES.	
Headache	27
Cramps	8
Faintness	2
Indigestion	5
Toothache	2
Hives	2
Hysteria	1
Sore throat	2
Total	49

CLASSIFIED ACCORDING TO DEPARTMENTS.	
Press	4
Office	12
Vulcan	1
Power	4
Trimming	11
Heel packing	5
Specialty	3
Carpenter	1
Cutting	3
Stock weighing	4
Light work	1
Total	49

SURGICAL CASES.	
Incised wounds	19
Punctured wounds	3
Slivers wounds	3
Abrasions wounds	16
Burns wounds	12
Eye conditions	10
Ear conditions	1
Infections	1
Blisters	4
Sprains	2
Dislocations	1
Contusions	3
Boil	2
Bee sting	1
Total	78

CLASSIFIED ACCORDING TO DEPARTMENTS.	
Mechanical	3
Mill	12
Inner tube	3
Power	2
Stock weighing	2
Machine shop	4
Yard	3
Press	8
Cutting	1
Specialty	7
Vulcan	8
Trimming	11
Shipping	4
Light work	4
Heel packing	5
Office	1
Total	78

Total cases, medical and surgical 127
Total treatments 152
Four accident insurance cases during the month included in the above.

Of the 114 calls made during June, 87 were for the purpose of investigation, 22 were sick and accident calls, and five were to request applicants to report. The 87 home calls revealed the following reasons for absence: personal illness, 26; personal business, 11; illness at home, 5; working elsewhere, 19; unsatisfactory excuses, 17; nobody home, 9.

Four of the applicants asked to report had taken other positions and only one reported to the Employment Office.

HAGEMEYER & BRUNN, 82 BEAVER STREET, NEW YORK, AN OLD and respected firm of crude rubber importers, were not able to meet their contracts last month and voluntarily requested the appointment of the following investigating committee: Edward Maurer, Edward Maurer & Co., Inc., chairman; William E. Bruyn, L. Littlejohn & Co., Inc.; A. H. Brown, Meyer & Brown, Inc.; C. R. Swaney, William J. Kelly, Poel & Kelly, and A. W. Stedman, Arthur W. Stedman, Inc., secretary of the committee.

News of the American Rubber Industry.

DIVIDENDS.

Ames-Holden-McCready, Limited, Montreal Quebec, Canada, declared its quarterly dividend of one and one-quarter per cent, payable July 2 on preferred stock of record June 21, 1920.

The Canadian-Connecticut Cotton Mills, Limited, New York City, and Sherbrooke, Quebec, Canada, has declared the following dividends: ten per cent on both A and B stock and an extra dividend of one-half of one per cent, all payable August 2 on stock of record July 15, 1920.

The Corn Products Refining Co., New York City, declared the regular quarterly dividend of $1 a share on common stock, payable July 20, and one and three-quarters per cent on preferred, payable July 15, besides an extra dividend of one-half of one per cent, all on stock of record July 6, 1920.

The Firestone Tire & Rubber Co., Akron, Ohio, declared the following quarterly dividends: $2 on common stock, payable June 20 on stock of record June 10, and one and one-half per cent on six per cent preferred stock, payable July 15 on stock of record July 1, 1920.

The General Tire & Rubber Co., Akron, Ohio, declared its quarterly dividend of one and three-quarters per cent on preferred stock of record June 20, payable July 1, 1920.

The Hood Rubber Co., Watertown, Massachusetts, has declared its quarterly dividend of one and three-quarters per cent, payable August 2 on preferred stock of record July 20, 1920.

The Kelly-Springfield Tire Co., New York City, has declared the following dividends: quarterly, $2 per share, payable August 16 on eight per cent preferred stock of record August 2; quarterly, cash, $1 per share, and quarterly, stock, three per cent, payable August 2 on common stock of record July 17, 1920.

The Manufactured Rubber Co., Philadelphia, Pennsylvania, declared its quarterly dividend of one and one-half per cent, payable July 7 on stock of record June 30, 1920.

The Meyer Rubber Co., Columbiana, Ohio, declared its quarterly dividend of two per cent, payable July 15 on outstanding preferred stock of record June 30, 1920.

The A. J. Stephens Rubber Co., Kansas City, Missouri, declared and paid its quarterly dividend on common stock July 1, 1920.

The Sterling Tire Corporation, Rutherford, New Jersey, has declared the following dividends: quarterly, one and three-quarters per cent outstanding seven per cent preferred stock; quarterly, two per cent on outstanding series B. preferred stock; and one per cent on outstanding common stock—all payable July 20 on stock of record July 6, 1920.

The Tyer Rubber Co., Andover, Massachusetts, declared its regular quarterly dividend of $1.50 per share, payable July 15, 1920, on common stock.

The United States Rubber Co., New York City, declared its regular quarterly dividends of $2 per share, payable July 31 on both common and first preferred stock of record July 15, 1920.

The Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, declared dividends of two per cent on both preferred and common stock, payable July 15 and July 31, respectively, on stock of record June 30, 1920.

FINANCIAL NOTES.

The United States Rubber Company has sold Kuhn, Loeb & Co. $20,000,000 ten-year 7½ per cent notes, secured by $25,000,000 of 6 per cent bonds, issued under the company's first and refunding mortgage of January 2, 1917. Owing to the present time being unfavorable for long-term bonds it was in the interest of the company to borrow upon the bonds for a shorter period of time rather than to sell them under existing conditions. The bonds themselves run for thirty years from January 2, 1917. The proceeds, with the current surplus earnings, will give the company sufficient funds for the completion of the plant extensions now in progress at Detroit, Hartford, Providence and Indianapolis, for the increase of the company's tire production, which is far below the demand. The company does not contemplate any further financing and it is not expected that there will be another meeting of the board of directors before the middle of September

Lee Rubber & Tire Corporation sales for the first six months of 1920 were approximately $4,400,000 and net profits before taxes amounted to $500,000. Estimated sales for the year are placed at $8,500,000. Business is active, though June as usual was the low month of the year. Almost 50 per cent of Lee's sales are now of its puncture-proof cord tires.

Westinghouse Electric & Manufacturing Co. is again shipping orders at the annual rate of fully $160,000,000. The transportation congestion has been entirely relieved, and orders are now being shipped without delay. Orders at the parent plant during first quarter of the fiscal year, which began April 1, were approximately $41,000,000, against $16,000,000 in first quarter of the last fiscal year. Annual rate of bookings is thus over $160,000,000 for the parent plant alone, and for all plants is running well above $180,000,000.

The remarkable growth of the automobile industry the last four years, especially since the close of the war, is reflected in expanding production and growing prosperity of rubber companies.

Total sales of rubber tires in the United States this year will exceed $1,000,000,000. In 1916 they were less than $500,000,000. In the current year approximately 40,000,000 tires will be produced, compared with 18,500,000 in 1916. In addition, millions of dollars' worth of rubber footwear, clothing and mechanical goods will be turned out.

The following tabulation from the Boston News Bureau, of four leading rubber companies, shows net profits after taxes per share on common, dividends paid on common, and net sales for 1916 and 1919 and estimates for 1920:

U. S. Rubber	Net Profits After Taxes	Per Share on Common	Divs. Paid on Common	Net Salee
*1920	$23,000,000	$22.00	a$8.00	$300,000,000
1919	17,730,237	17.59	b2.00	225,589,465
1916	10,302,195	15.12	.....	126,759,129
Goodyear:				
*1920	‡30,000,000	c42.00	b12.00	225,000,000
1919	‡23,277,245	98.58	12.00	168,914,982
1916	7,003,330	35.65	e12.00	63,950,000
Goodrich:				
*1920	‡18,000,000	30.00	6.00	210,000,000
1919	‡17,304,813	25.09	4.00	141,343,419
1916	9,568,764	12.75	4.00	70,990,782
Kelly Springfield:				
*1920	2,500,000	9.00	g4.00	†.....
1919	2,422,522	9.82	h4.00	†.....
1916	1,908,819	8.62	3.75	†.....

*Estimated annual rate.
aStock dividend of 12½ per cent declared January.
bCommon dividends at $8 annual rate resumed October, 1919.
‡Before federal taxes.
cOn basis of common capitalization after giving effect to 150 per cent stock dividend declared June, 1920.
dAlso 150 per cent stock dividend.
eAlso 100 per cent stock dividend.
gCurrent dividends are at annual rate of $4 a share cash and 12 per cent stock.
hAlso 9 per cent stock dividend.
†Not available.

United States Rubber Co. is the largest producer of rubber footwear in the world. It ranks second in production of tires. Large demand for rubber footwear which will accrue this fall, when dealers replace stocks depleted by last winter's severe

weather, and the steadily increasing output of tires resulting from operation of new plants nearing completion, should bring sales this year close to $300,000,000, a $75,000,000 increase over last year and two and one-half times business in 1916. After almost four years of no dividends on the common, disbursements at annual rate of $8 a share were resumed last October. As a further reward to junior shareholders a stock dividend of 12½ per cent was declared in January. It is not unlikely that another stock distribution will be made before the end of this year.

Goodyear Tire & Rubber Co. expects to earn $30,000,000 before federal taxes this year. This would be equivalent to about $42 a share on 618,900 shares of common which will be outstanding on conclusion of present financing and payment of 150 per cent stock dividend declared last month. The company has been paying common dividends at annual rate of $12 a share in cash since 1900. In the same period 450 per cent in stock dividends has been distributed.

The B. F. Goodrich Co. will do a business this year approximately three times greater than in 1916 and net profits before federal taxes, estimated to reach $18,000,000, will be almost double 1916 net of $9,568,764. Although the company was obliged to do some financing recently, issuing $30,000,000 five-year 7 per cent notes, the common was placed on a $6 a share annual dividend basis in January, compared with previous rate of $4 a share.

Kelly-Springfield Tire Co. has not shown an increase in earnings in the same proportion as the others, for the reason that its manufacturing capacity has not been expanded. It has under construction a new plant at Cumberland, Maryland, which will have a capacity greater than all its existing plants. The new factory will not be completed before end of this year, but Kelly-Springfield should show results of this development in 1921.

NEW INCORPORATIONS.

Aetna Tire & Rubber Co., June 30 (New York), $300,000. O. C. Meyer; E. W. Hallam; F. Trautwein, Jr.—all of 587 Manhattan avenue, New York City.

Ames Holden Rubber Boot Co., Ltd., May 5 (Canada). Preferred stock, $800,000. Common Stock $2,200,000. T. H. Rieder, president; directors—R. W. Ashcroft, D. L. McGibbon, H. Wellein, W. B. Wiegand. Principal office, Montreal, Quebec, Canada. Factory, Kitchener, Ontario, Canada. To manufacture and deal in rubber boots and shoes and all other things of which rubber forms a part.

Anderson Tire & Rubber Co., July 12 (Delaware), $7,000,000. L. Horty, M. C. Kelly, S. T. Mackey—all of Wilmington, Delaware.

Argonaut Tire & Rubber Co., February 5 (California), $3,500,000. R. Whitson; H. G. W. Dinkelspiel—both of Chronicle Building, San Francisco, California. Principal office, Oakland, California. To deal in auto tires and rubber goods for automobiles.

Cowart Non-Blow Out Tube Co., January 2 (Texas), $150,000. M. A. Dees, president; S. A. Cowart, vice-president; J. T. Simmons, secretary. Principal office, Midlothian, Texas. To manufacture tube that does away with all pinches, punctures and will not blow out if protected from the ground with small boots, no matter how old the casing.

Eastern Rubber Reclaiming Co., July 1 (Massachusetts), $30,000. H. E. Rooney, 24 Everett avenue; F. V. O'Neill, 196 Hamilton street; J. E. Marden, 42 Harvard street—all in Dorchester, Massachusetts. Principal office, Boston, Massachusetts. To conduct general rubber reclaiming and manufacturing business.

Eclipse Cord Tire Corp., June 16 (Delaware), $1,000,000. L. E. T. Connett, White Plains; W. J. Cullen, New York City; C. M. McKeever, Brooklyn—all in New York. To manufacture tires.

Erie Cord Tire Co., Inc., The, July 22 (New York), $50,000. F. X. McFarland; J. J. Cosgrove, both of 72 West 93rd street; T. Lyons, 122 West 102nd street—both in New York City. To deal in tires and automobile accessories.

Gillette Tire Company of New Jersey, Inc., May 25 (New Jersey), $25,000. F. F. Mitchell, 176 Peshine avenue; J. J. Keller, 46 North 17th street; U. G. Taylor, Jr., 163 Elizabeth avenue—all in Newark, New Jersey. Principal office, 164 Market street, Newark, New Jersey. Agent in charge, T. Furst. To deal in tires

Goody Rubber Co., Inc., June 28 (New York), $50,000. H. F. Vortkamp, 240 Broadway; R. M. Williams, 286 West 127th street, both in New York City; I. B. Joselow, 4922 New Utrecht avenue, Brooklyn—both in New York. To manufacture rubber and gutta percha.

Hartigan, Inc., John D., July 22 (New York), $5,000. J. D. Hartigan; E. J. Barnett; J. M. Kennedy—all of Lockport, New York Principal office, Lockport, New York. To deal in tires and automobile accessories.

Hydro-Speedway Tire Corp., July 9 (New York), $25,000. W. Stahlka, president and treasurer; A. A. Burkard, vice-president; H. Seitz, secretary. Principal office, 146 East Genesee street, Buffalo, New York. To deal in automobile tires.

Lion Tire & Rubber Co., Ltd., The, February 17 (Canada), $2,500,000. J. H. Greenberg, president; A. Tipling, vice-president; J. A. Campbell, secretary and treasurer. Principal office, 502 Kent Building, Toronto, Canada. To manufacture automobile tires, tubes and any other line of goods of which rubber forms a part.

Mason Rubber Plantations Co., The, April 5 (Ohio), $6,500,000. O. M. Mason, president; J. H. Diehl, vice-president; R. W. MacKinnon, vice-president; D. M. Mason, treasurer; W. A. Cluff, secretary. Principal office, Kent, Ohio. To own rubber plantations; to buy and sell crude rubber.

Mead Rubber Co., Inc., July 6 (New York), $100,000. J. F. Mead, 244 Jefferson avenue; J. L. Hagan, 1208 Dean street; A. P. Hagan, 114 Prospect place—all of Brooklyn, New York. Principal office, Brooklyn, New York. To manufacture tires.

Mechanical Rubber Manufacturing Co., May 19 (Massachusetts), $200,000. F. H. Nesmith, 6 Riedesel avenue, Cambridge; M. A. Tobin, 43 Fenwood Road, Boston; J. S. Stone, Wayland—all in Massachusetts. Principal office, Boston, Massachusetts. To manufacture, buy, sell, and deal in rubber articles.

Model Glue Mfg. Co., Inc., July 6 (New York), $10,000. F. Auerhahn, 470 55th street; M. Spivack, 1213 41st street, both of Brooklyn; H. Sherman, 541 West 144th street, New York City both in New York. To manufacture glue, rubber cement, etc.

No-Air Auto Tire Co., Inc., July 8 (New York), $100,000. I. Trautman, 1909 52nd street; G. A. Carlucci, 188 President street, C. P. Carlucci, 239 Union street—all of Brooklyn, New York. Principal office, Brooklyn, New York. To manufacture tires.

Nojar Rubber Co., June 15 (Massachusetts), $100,000. T. Lithgow, 15 Gray street, Boston; A. E. Whittemore, 32 Winthrop Hall, Cambridge; V. G. Hopkins, 24 Hall avenue, Watertown—all in Massachusetts. Principal office, Boston, Massachusetts. To buy, sell and deal in any and all products made in whole or any part of rubber.

Poughkeepsie Tire Sales Co., July 16 (New York). $20,000. Raymond O. and Signor J. Seevers, 29 Market street, Poughkeepsie; J. F. Snyder, 245 West 55th street, New York City—both in New York. Principal office, Poughkeepsie, New York.

Prize Tire & Rubber Co., June 10 (New York), $7,500. H. Zaum, M. M. and R. Forma—all of 145 West 117th street, New York City. To make automobile tires.

Regent Tire & Rubber Co., Inc., June 28 (New York), $20,000. H. O. Kahan, president and treasurer; J. M. Saunders, secretary; I. L. Jacobson, vice-president. Principal office, 8 Stuyvesant street, New York City. To buy, sell, import, export and generally deal in tires and tubes.

Reliable Tire Service, Inc., June 24 (New York), $10,000. G. L. Jones, 489 Washington avenue; V. L. Belding, 25 Ten Eyck avenue; E. A. Piersen, 618 Myrtle avenue—all of Albany, New York. Principal office, Albany, New York.

Sanitary Rubber Products Co., June 10 (Delaware), $275,000. F. R. Hansel; J. V. Pimm; E. M. MacFarland—all of Philadelphia, Pennsylvania.

Service Rubber Co., The, March 5 (Ohio), $25,000. V. W. Rothe, T. E. Wilson, R. C. Goode, H. O. Hoffman, F. B. Wilson. Principal office, 381 Windsor street, Akron, Ohio. To manufacture dipped rubber goods, specializing in toy balloons.

Smith Tire Corp., Ray, June 21 (New York), $500. R. L. Smith, Hollis. Long Island; E. A. London, 792 Sutter avenue, Brooklyn; D. Fried, 317 Stanton street, New York City—all in New York. To conduct tire business.

Standard Rubber Co., June 23 (Delaware), $5,000,000. T. L. Croteau, M. A. Bruce, S. E. Dill—all of Wilmington, Delaware. To manufacture rubber articles.

Standard Rubbers Finance Co., June 23 (Delaware), $250,000. T. L. Croteau, M. A. Bruce, S. E. Dill—all of Wilmington, Delaware. To deal in rubber securities.

Tire Service Corp., June 16 (Delaware), $100,000. C. T. Cohee; G. G. Steigler; E. E. Aberlee—all of Wilmington, Delaware. To do a wholesale and retail tire and automobile accessory business.

Valentine-Fitch Rubber Co., May 28 (California), $100,000. W. D. Valentine, 229 Western Mutual Life Building, Los Angeles, California. Principal office, Los Angeles, California. To deal in all kinds of rubber goods.

Zaun Tire & Rubber Co., Inc., H. C., July 6 (New York), $100,000. R. Forma, 145 West 117th street; F. Fischer, 309 Broadway, both of New York City; H. C. Zaun, 107 Beebe avenue, Queens, both in New York. To manufacture tires.

SIXTH NATIONAL EXPOSITION OF CHEMICAL INDUSTRIES.

Returning to New York City, the Sixth National Exposition of Chemical Industries will open in Grand Central Palace, September 20 and continue until September 25, inclusive. The expansion in the chemical industry, as shown by the increased number of exhibitors, necessitates the use of four floors in the Palace, and applications for space are still being received almost daily, so great is the interest in the exposition. Total applications for space up to June 30, were 358, which is a new record. The exposition this year will be more pretentious than ever; in fact, it will be the largest distinctly industrial exposition ever held, and will surpass its own predecessors by one-third.

Two new sections will feature the exposition this year. These are the Fuel Section and the Materials Handling Section. Both are considered very important. The business side of the exposition will have many interesting features. These include sessions on subjects which will be developed in the two new sections of the exposition, and sessions on chemical engineering for which elaborate programs have been planned. Motion pictures which will have keen interest for technical men, will be part of the program and there will also be addresses for the education of the public.

A WIDELY KNOWN FACTORY MANAGER.

John Kearns, manager of the Lee Tire & Rubber Co., Conshohocken, Pennsylvania, was born in Boston, Massachusetts, in 1860, and was educated in the public schools of that city, graduating later from Comer's Commercial College. His first employment was with the Boston Car Spring Co. in 1879. In 1891 he joined the Overman Wheel Co., where he had charge of the rubber departments until 1898, when he went to the India Rubber Co., of Akron, Ohio.

John Kearns.

Three years later he went to Melbourne, Australia, to join the Dunlop Rubber Co. forces, where he remained until 1913, when he became associated with the Fisk Rubber Co., Chicopee Falls, Massachusetts. In 1916 he went to the Lee Tire & Rubber Co. and is at present its manager.

Mr. Kearns has had an exceptionally varied experience in the rubber business. He is almost as well known in England and the British Colonies as in America. In Ceylon he is interested in a rubber plantation and has many acquaintances throughout the Far East. He is a member of several fraternal orders and president of the Tuberculosis Relief Association of Springfield.

PERSONAL MENTION.

A post card from Raymond B. Price, one of the directors of the United States Rubber Company, dated Singapore, Straits Settlements, May 25, reports him visiting the Sumatra plantations of the company on the way to Japan.

Bushnell Bigelow, who for some time has been manager of eastern sales for The New Jersey Zinc Co., Inc., 116 Front street, New York City, now is assistant general sales manager for the company. Walter L. Hess takes Mr. Bigelow's place as manager of eastern sales.

Murray S. Bierer has entered the rubber brokerage business, with offices at 299 Broadway, New York City.

A. L. Viles, of The Rubber Association of America, has been honored by appointment upon the recently created New York Terminal Committee, to represent the shippers' interests. The other members are A. J. Miller, of the Delaware, Lackawanna & Western Railroad Co., representing the carriers; James Maybury, Jr., of the Public Utilities Commission of New Jersey, and Alfred M. Barrett, of the Public Service Commission, First District, New York.

The duties of the committee are somewhat similar to those of the terminal committees which served while the Government was operating the railroads. Their primary object is to bring about the greatest measure of cooperation among all the elements connected with the transportation situation.

Charles Mulier, general manager of the Standard Emarex Co., Chicago, Illinois, has severed his connection with the company and will engage in the mineral rubber business for himself. He has been identified with the company since its inception and is largely responsible for its success. During an experience of fourteen years he has studied the requirements of rubber manufacturers and has made many friends in the trade.

Edward J. Brown, formerly a salesman in the employ of the Acme Rubber Manufacturing Company, Trenton, New Jersey, and now connected with the Hood Tire & Rubber Company, of Pittsburgh, Pennsylvania, was recently married to Miss Mae St. Clergy, of Rockford, Illinois. The wedding took place at Erie, Pennsylvania.

Henry C. Pearson, Editor of The India Rubber World, New York City, has accepted an invitation to join the Honorary Advisory Council of the Fifth International Exhibition of Rubber, Other Tropical Products and Allied Industries and of the International Conference to be held in connection therewith in London in June, 1921, under the chairmanship of Dr. Joseph Torrey, A.M., Ph.D.

FACTORY MANAGER, SYRACUSE RUBBER CO.

William E. Greer, factory manager and third vice-president of the Syracuse Rubber Co., Inc., Syracuse, New York, is a native of Akron, Ohio, where he was born April 24, 1884. He attended the grammar and high schools in that city and in 1898 entered the employ of The B. F. Goodrich Co., with which firm he remained until 1906, the first four years in the druggists' sundries department and the last four in the automobile tire department.

William E. Greer.

Going to the Firestone Tire & Rubber Co. for a year as inspector of automobile tire casings, he then took a position with The Miller Rubber Co., starting its automobile casing and inner tube departments and remaining in charge for ten years. In 1917 he went to the Mid-Continent Tire Manufacturing Co., Wichita, Kansas, as factory superintendent, and on June 1, 1919, became factory manager and third vice-president of the Syracuse Rubber Co., Inc.

Mr. Greer's wide experience in some of the leading tire factories of the country and his specialized knowledge of cord tire construction well fits him for the task before him with this flourishing young company.

Mr. Greer is a Royal Arch Mason and a member of the Elks and Rotarians.

THE RUBBER TRADE IN THE EAST AND SOUTH.

By Our Regular Correspondent.

NEW YORK NOTES.

The Electric Storage Battery Co. has removed its New York office from 100 Broadway, where it had been for the last twenty-two years, to the National Association building, 23-31 West Forty-third street.

The Hohmann, Nelson Co., Eau Claire, Wisconsin, manufacturer of a complete line of temperature, time and condensate controllers, recording and indicating thermometers, steam pressure regulators, etc., has opened an eastern sales office and sample room at 1599 Nostrand avenue, Brooklyn, New York, in charge of B. O. Pallin.

Mecke & Co., New York City, importers of crude rubber, etc., have admitted Nicholas Bruning, Orange, New Jersey, to the partnership whose other members are Hugo Volkening and Henry A. Ahrens.

The Hodgman Rubber Co., Tuckahoe, New York, is adding four additional stories to a one-story, reinforced concrete building already constructed, for the purpose of consolidating certain manufacturing operations.

The newly elected officers and directors of The Polack Tyre & Rubber Co., Broadway and 62d street, New York City, are as follows: Samuel Mundheim, chairman; Hugo Hoffstaedter, president; Reuben Mundheim, treasurer; Milton Dammann, secretary, and John F. Crowley, auditor.

The Powertown Tire Corporation, Rochester, New York, which was formerly The Rochester Tire & Rubber Co., has announced the following officers: Thomas J. Costello, president and general manager; Henry J. Crowder, vice-president; Dr. Ernest W. Ewell, treasurer; Arthur M. Johnson, secretary, and E. O. Benning, director.

The Niagara Rubber Manufacturing Co., 246 Herman street, Buffalo, New York, is a partnership of brothers organized for the pulling or reclaiming of fabric for manufacturers and to make blow-out patches, reliners, and skived patches. H. Heimerl is manager.

The Ajax Rubber Co., Inc., has found it necessary to move its Philadelphia branch office to larger premises, at 846 North Broad street.

CONNECTICUT NOTES.

The Kelley Tire & Rubber Co., Inc., New Haven, Connecticut, has increased its capital stock from one million to five million dollars. The company moved from its temporary headquarters into its new office building on July 14. The foundation and part of the first story of the main factory are well under way, indicating that the plant will be in operation late this fall, and making 500 cord tires and 2,500 inner tubes daily.

The New Haven Sherardizing Co. announces the removal of its main office from New Haven, Connecticut, to 868 Windsor street, Hartford, Connecticut. The factory was removed some time ago, as previously stated in our news columns.

SOUTHERN NOTES.

The Hopewell Insulation & Manufacturing Co., Inc., Hopewell, Virginia, which was incorporated in March, 1920, has installed extensive equipment for the manufacture of insulating compositions, insulators, and parts for electrical transmission, as well as for use with wireless apparatus. It expects to begin production at an early date and be able to build dies in addition to making molded insulation parts for electrical use. S. S. Sonneborn is president and general manager.

The Dixie Rubber Co., 768 Randolph building, Memphis, Tennessee, has practically completed the sale of its stock and authorized placing of contracts for its new factory, which it expects to have completed and in operation by January of next year. The factory equipment will cost approximately $220,000 and the powerhouse equipment over $100,000. The total cost of the plant and equipment is estimated at $434,600. William J. Greene is factory manager.

The Cord Tire Corporation, Chester, West Virginia, maker of "Superior" cord tires, has raised its capitalization from $500,000 to $1,000,000, in order to take care of increased business. The officers are: J. D. Comstock, president; H. B. Woodbury, vice-president, and H. J. Powers, secretary-treasurer.

E. T. Dempsey has been appointed manager of the Baltimore branch of the Mason Tire & Rubber Co., Kent, Ohio.

"Truckportation" is proposed as a term to replace the words "truck transportation," in the interests of ease in use, descriptive value, and headline adaptability.

THE RUBBER TRADE IN NEW JERSEY.

By Our Regular Correspondent.

TRENTON NOTES.

The Luzerne Rubber Company, Trenton, has purchased a large tract of land along Brunswick avenue, fronting on the East Trenton Railroad. Since it was bought for investment purposes the consideration was not given. The property has a frontage of 60 feet and a depth of 900 feet and contains about five acres of land. It is an excellent one for manufacturing purposes, with good railroad facilities.

The K. B. Rubber & Tire Co., 117 East Hanover street, Trenton, New Jersey, has been made the New Jersey distributer for Bergougnan tires and tubes.

Charles H. Semple, president of the Semple Rubber Co., Trenton, has been made a director of the Carteret Club, which organization will shortly erect a new club house at a cost of $200,000.

Thomas Hydes, a crude rubber broker, has purchased a three-story factory building at 109 Chancery street, Trenton. Mr. Hydes has had his headquarters on East Hanover street for the past twenty years and will now have considerably more room in his new location.

Three of the Trenton rubber manufacturing companies have taken out permits for the erection of additions. The Woven Steel Hose & Rubber Co. has let a contract to John Carrigan for a one-story boiler house on Prospect street to cost $2,000. The United & Globe Rubber Co. will erect a one-story cement block addition to cost $1,500. The Home Rubber Co. will build a one-story frame building on Woolverton avenue to cost $1,500.

The Thermoid Rubber Co. has awarded a contract to the American Metallurgical Corporation, Philadelphia, for the installation of electric oven equipment to take care of the production of a special processed product to be placed on the market by the Trenton concern. The installation involves a number of new principles, especially pertaining to solvent recovery and automatic control of heat temperatures. The ovens will be placed in the new addition now being erected.

John E. Thropp's Sons Co., Trenton, New Jersey, has a new foundry under construction, which will cost about $80,000. The building will be 75 by 250 feet, and all necessary equipment has been purchased and is ready for installation.

MISCELLANEOUS NEW JERSEY NOTES.

The Duratex Co., Newark, New Jersey, expects to occupy the new addition to its plant by September 1. Ground for the new buildings was broken in December, 1919.

Announcement is made of the removal of the Bayonne, New Jersey, store of The Hudson Packing Co. to 67 East 21st street, Bayonne.

The Braender Rubber & Tire Co., Rutherford, New Jersey, has practically completed a one-story power house addition, which is expected to be in operation by the first of the year. The new building is 73 by 75 feet.

The Ford Tire Co., Erie, Pennsylvania, contemplates establishing a tire manufacturing plant at Burlington, New Jersey William James Whittom and Harry Raflovich, of the Ford company, called upon the city officials of Burlington and said they wanted to erect a plant for the manufacture of reconstructed tires and new tires. They announced that about $250,000 would be raised to start the factory and that the concern would eventually be capitalized at $2,000,000.

The factory will be two stories high and will employ about 300 men. Messrs. Whittom and Raflavich are said to have purchased a tire factory at Erie and the machinery is now being made at Trenton. The company claims to have a new mold which cuts

down the time of making a tire. The Burlington officials agreed to donate a parcel of land to the new tire company.

The Manhattan Rubber Manufacturing Co., Passaic, New Jersey, has let to the Stone & Webster Company, Broadway, New York, the contract for the erection of its reinforced concrete brick and steel plant. The estimated cost is $1,000,000.

The Eastern Tire & Equipment Co., with principal offices at 22-26 Union avenue, Rutherford, New Jersey, has filed a certificate of dissolution in the office of Secretary of State Martin at Trenton.

The Dural Rubber Corporation, Flemington, New Jersey, by arrangement with the Automatic Safety Tire Valve Corporation, 1765 Broadway, New York City, will include the "Whistler" tire valve as part of the regular equipment of all Dural tubes, adding only 35 cents to the cost of each tire. This tire valve was described on page 366 of The India Rubber World, March 1, 1920.

The Whitall Tatum Co., 46-48 Barclay street, New York, will soon have increased facilities at its druggists' sundries plant at Keyport, New Jersey. Ground for a three-story steel and concrete addition has already been broken, and the company hopes to occupy it by October first. The addition and equipment will cost about $200,000. The steady increase in the sale of "dependable goods" has made the extension necessary, though in the face of almost prohibitive building conditions.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent

The feature of the business situation among the Rhode Island manufacturing rubber industries and their auxiliary and coördinate branches, during the past month, has been the vacation period, practically all the plants in the State having been closed one or two weeks. Advantage has been taken of this opportunity for an overhauling of power and machinery, renovations, alterations and improvements.

In accordance with a plan announced this spring, the Alice Mill of the Woonsocket Rubber Co., at Woonsocket, closed down for one week, beginning July 31 and opening August 9. This plan is not in accord with usual custom of one department shutting down after another, but all were shut down on the same day and all started up again on the same day.

The National India Rubber Co., at Bristol, shut down its entire plant on July 31, for a period of one week, to reopen August 9. This is to be a vacation with pay for all the employes of the factory who reported for work after the recent cessation without the necessity of recourse to the reemployment plan.

The following changes in the organization of the National India Rubber Co., Bristol, were recently announced, to become effective immediately: James W. Franklin, assistant to the vice-president; Edward I. Cooper, factory manager; Edward A. Currier, Jr., industrial relations manager; A. W. Anthony, manager of central stores. Mr. Franklin had been superintendent of the plant and Mr. Cooper, assistant superintendent. Mr. Currier had been an office executive and Mr. Anthony had been industrial relations manager.

A three-day conference of the truck tire experts of the United States Tire Co. was held July 12, 13 and 14. The conference opened with a session at the Hotel Astor, New York, July 12. A banquet in the evening was followed by a theatre party, after which the convention proceeded to Providence, where Harlow W. Waite, factory manager of the Revere Rubber Co.'s plant, Valley street, Providence, addressed the conference. He commented on the fact that the motor truck industry seemed to be on the verge of an expansion fully as great as that which came to the passenger car industry a decade ago, and that Providence, as the centre of the United States Tire Co.'s truck tire activities, was destined to have a large share of it.

The conference, which was attended by more than 100 truck tire experts in the employ of the United States Tire Co., representing every State in the country, assembled at the new truck tire manufacturing plant of the Revere Rubber Co., which has been named the Colt plant in honor of Colonel Samuel P. Colt. Tuesday and Wednesday were devoted to the conference on truck tire development, at the first session the subject being solid tires, with C. K. Whidden, of New York, manager of the solid tire department, presiding. On Wednesday, W. V. Logan, manager of the pneumatic truck tire department, was in charge of the discussion. An inspection of the new Colt plant, with its special equipment of the most modern solid-tire-making machinery, was a prominent feature of the conference programme.

One of the most interesting events of the convention was the presentation to George S. Shugart, vice-president and general sales manager, of a set of platinum and pearl studs and buttons.

The rubber bathing suits that are being made by the Revere Rubber Co. at its plant on Valley street, Providence, were given a picturesque introduction to the public the latter part of June when some half a hundred Providence children appeared in a pretty bathing beach scene at one of the theatres. While the particular costumes used in the scene were designed expressly for the act, they were manufactured in exactly the same manner as the regular goods. The costumes are cut from a roll of thin rubber sheet a yard wide and 50 yards in length. This is done on the upper floor of one of the several buildings which compose the plant. Here, more than 300 young women, working under ideal sanitary conditions, cut most of the patterns and trimmings. The machine assembling is done on this floor, but the finer work of assembling is done on a lower floor. The trimmings, such as birds, butterflies and other decorations, are cemented on the caps, and the goods are inspected for the second time before going to the vulcanizing room, after which they are inspected for the last time, and any defective ones thrown out. At the theatrical performance, where hundreds of persons learned for the first time of the existence of such garments, many expressed surprise at the bright coloring of the costumes.

On July 15 the figures of the State Board of Tax Commissioners of the State revenue from corporate excess, franchise, public service and bank share taxes were made public, together with a list of all individuals, firms and corporations having an excess of $100,000 or more. Included in this list are the following, with the amount of their excess: American Electrical Works, Phillipsdale, $2,652,932.44; American Multiple Fabric Co., $124,296; American Wringer Co., New York, $1,034,252.95; Anchor Webbing Co., Pawtucket, $252,420.06; Arbeka Webbing Co., Pawtucket, $163,438.99; Atlantic Tubing Co., Cranston, $244,574.50; Bourn Rubber Co., $276,700.29; Collyer Insulated Wire Co., Pawtucket, $505,759.07; Davol Rubber Co., $384,364.66; Everlastik, Inc., Boston, $351,695.20; Federal Felting Co., Westerly, $126,103.60; Glendale Elastic Fabric Co., Easthampton, Massachusetts, $327,520.53; Goodby-Rankin Co., $139,366.66; The B. F. Goodrich Rubber Co., Akron, Ohio, $279,073.26; The Goodyear Tire & Rubber Co., Akron, Ohio, $291,601.79; Hamilton Webbing Co., Hamilton, $259,347; Hill & Lacross Co., $257,534.65; Hope Webbing Co., Pawtucket, $1,855,467.54; International Braid Co., $1,409,900.80; Jenckes Spinning Co., Pawtucket, $8,059,520; Mechanical Fabric Co., $577,446.97; Mount Hope Spinning Co., Warren, $465,791.81; National India Rubber Co., Bristol, $2,213,025.04; O'Bannon Corporation, Boston, $1,394,939.87; Phillips Wire Co., Pawtucket, $2,159,288.83; Revere Rubber Co., $524,114.01; Tamarack Co., Pawtucket, $529,541.80; Tubular Woven Fabric Co., Pawtucket, $243,921.90; United Lace & Braid Co., Auburn, $512,951.51; United States Rubber Co., New York, $2,105,090.29; Washburn Wire Co., Phillipsdale, $1,375,956.45; Woonsocket Rubber Co., Woonsocket, $607,025.83. The enormous increase of $3,994,861.70 over the tax of 1919 is shown in the assessment of the Jenckes Spinning Co., which has a corporate excess of $8,959,920.

A contract has been awarded to the Flynt Building & Construction Co., of Palmer, Massachusetts, for the erection of a three-story addition, 95 by 42 feet, to the storage house of the American Wringer Co.'s plant in Woonsocket, and work thereon will be commenced shortly. One floor of the addition is to be used for the manufacture of boxes and crates, and machinery for this purpose will be installed. The remaining two floors of the new building are to be devoted to storage purposes.

Frederick E. Luth, for the past 15 years in the employ of the Glendale Elastic Fabric Co., Providence, during several years of which time he was foreman in one of the departments, died June 27 in his 47th year. He was born at Newport, Rhode Island, and is survived by his widow, four sons, a sister and two brothers.

Clyde O. Dudley, for the past four years traffic manager at the National India Rubber Co.'s plant, Bristol, has resigned to accept the position of traffic manager of the Woonsocket Chamber of Commerce and assumed his new duties July 12. He is succeeded by J. D Cruickshank of the purchasing department.

FIRST GOODRICH SALESMAN IN NEW ENGLAND.

Ellsworth E. Leach, Boston manager of mechanical and sundry sales for The B. F. Goodrich Rubber Co., was born at North Easton, Massachusetts, in 1862. Upon completing his course in the Stoughton High School in 1878 he began his career in the rubber trade as errand boy for the American Rubber Co., Boston. During most of the twelve years he remained with this concern he was engaged in sales, first as a traveling salesmen of general rubber lines in New York State and Canada. In 1884 Robert D. Evans, president of the company, appointed him associate manager to open the first New York office of the company as assistant to Eben H. Paine, who was later sales manager of the United States Rubber Co., Mr. Evans being the second vice-president of the latter company following Joseph Banigan. Mr. Leach's sales work covered footwear and clothing from New York west to Chicago and south to the Ohio River, including Philadelphia, Baltimore and Washington.

Ellsworth E. Leach.

In 1890 Mr. Leach opened in Boston the largest wholesale and retail rubber store in New England, known as the Metropolitan Rubber Co. From 1894 to 1899 he was engaged in the manufacture of rubber clothing and mackintoshes under the firm name of E. E. Leach & Co., Boston.

In the latter year Mr. Leach became the first traveling salesman for The B. F. Goodrich Co. in the New England territory. In 1902 the Goodrich company opened a small office carrying a small stock of specialty and mechanical goods in addition to tires, and Mr. Leach was made manager of both the mechanical and specialty departments. The company moved into a larger store on Columbus avenue in 1905, and five years later to the present six-story building on Boylston street. Mr. Leach did all of the traveling sales work from 1899 to 1910. Since then the New England traveling force has grown to seven men with Mr. Leach still on the job.

On May 1, 1920, Mr. Leach rounded out twenty years of loyal and faithful service and the sales force and department managers of the company remembered the anniversary by giving a dinner in his honor and presenting him with twenty $20-gold-pieces, one piece for each year of service. Mr. Leach has a very wide acquaintance and many friends in the rubber goods trade and he has played an important part in guiding the destinies of the Goodrich company in this part of the United States. He is a member of the Boston Athletic Association, Bay State Automobile Club, G. A. R. Associates and has been for many years a trustee of the Universalist church of Stoughton.

THE RUBBER TRADE IN MASSACHUSETTS.

By Our Regular Correspondent.

"Truckportation"—new terminology for freight hauling by pneumatically equipped motor trucks—has been given tremendous impetus in Boston and adjacent territory by the establishment of fifteen motor truck routes by The Goodyear Tire & Rubber Co. to give speedy and regular deliveries to service stations in the vicinity of Boston.

More than 68 per cent of all distribution from the local branch is being made by motor trucks, approximately 400,000 pounds of rubber products being transported each month. It is planned to deliver eventually by truckportation 95 per cent of sales made by the Boston office. Over 350 service stations are served by the fifteen truck routes. The company plans similar lines for those of its 74 branches in the United States affected by railroad transportation tie-ups.

The longest route running from the Boston branch is a two-day "Cape Cod" trip of 250 miles from Boston to Orleans, made weekly with stops at Plymouth, Sagamore, Brewster, Chatham, Woods Hole, Buzzards Bay and Wareham. The trip serves 40 distributers. The shortest line is the 50-mile run to Brockton, requiring less than eight hours and serving 12 distributors.

The 110-mile trip to Worcester is made tri-weekly in less than a working day to serve 33 service stations. Other routes run to Lowell, Weirs, Portsmouth, New Hampshire; Marlboro, Fitchburg, Athol, Rutland, Millbury, Haverhill and Gloucester, with many intermediate stops. Keene, New Hampshire is the terminus of a 168-mile route that will be established shortly.

BOSTON NOTES.

The O'Bannon Corporation, 30 State street, Boston, has had the honor of being recently cited by the War Department for meritorious service in the War.

The Central Automobile Tire Co., 111 Staniford street, Boston, is now a direct factory distributer for the Sterling Tire Corporation, Rutherford, New Jersey.

Lehigh tires are now available to New England motorists, a branch of the parent firm known as the Lehigh New England Tire Co. having been opened at 559 Columbus avenue, Boston. Fred W. Dogherty is manager and will be assisted in developing business in this territory by Paul H. Bradley, eastern sales representative.

The Croker Pen Co., 36 Bromfield street, Boston, has awarded a contract for a one-story addition to its plant at Everett, Massachusetts, 60 by 120 feet, to cost $45,000 to $50,000.

L. J. Waldron, for the last five years assistant manager of the Boston branch of the Pennsylvania Rubber Co., Jeannette, Pennsylvania, has been promoted to the position of manager of the New England territory of the same company, with headquarters at Boston.

H. H. Greenwood, a pioneer in the automotive industry, and for the past five years general sales manager for the Hood Tire Co., Boston, is New England distributor for Syra-Cord tires, with offices and salesrooms at 739 Boylston street, Boston. Mr. Greenwood's firm, the Syra-Cord Tire Sales Co., has established twenty agencies throughout New England.

MISCELLANEOUS MASSACHUSETTS NOTES.

The first of a series of Harvard University summer school visits to industrial plants in this vicinity was made July 13, when G. F. Miller conducted fifty students through the plant of the Hood Rubber Co. at Watertown.

One of the best features of the service work of the Hood Rubber Co., Watertown, is the nursing of employes who are ill. Rain or shine, a corps of efficient nurses makes a daily round visiting the homes of Hood operatives who are out because of sickness. Each nurse has her Ford coupé for better comfort and in order to make the most of her time. In working conditions, medical and dental attention, and care in sickness the company is doing everything possible to build up a body of stable working men and women.

The Tyrian Service Association of the Tyer Rubber Co., Andover, Massachusetts, has recently approved a set of badges which will be awarded to those completing one, ten, fifteen, twenty, twenty-five and thirty-five years of service. Several employés, including the general manager, will receive the thirty-five year badge.

Hood Nurses Starting Their Daily Rounds.

For the last few months, groceries have been supplied to the employes through a cooperative buying plan. The cost of goods has thus been reduced, and a supply of sugar for the canning season secured. An athletic committee has lately been appointed, and a baseball team organized.

The recreation department of The Fisk Rubber Co., Chicopee Falls, has long been a potent factor in building up a contented, efficient working force, and this season its activities take on new interest through the addition of new buildings and facilities at Fisk Park, including a new restaurant and handball court. The park night season of Friday evening entertainments was ushered in July 16, when the park was officially opened for the year. There were the usual Red Tops' baseball game, handball, tennis, quoits, trap shooting, special track events, motion pictures, fireworks and dancing with music by the Fisk jazz orchestra. The restaurant makes it possible for Fiskers to go direct to the park after working hours, get a good meal and make the most of the long summer evenings afforded by daylight saving.

Friday afternoons there are special festivities for the mothers and children of Fisker families, and this year the playground section of the park has more new equipment for the kiddies, such as swings and slides. Admission is by identification card obtainable free of the recreation department.

The Metropolitan Air Goods Co., Athol, Massachusetts, a subsidiary of the Athol Manufacturing Co. of the same place, is building a new two-story plant, 50 by 140 feet, to be equipped with modern machinery for the manufacture of hospital rubber goods. The original company was formed in Boston in 1891 and survived under difficulties until 1913, when it was taken over by R. A. Whall, now its manager and treasurer, and incorporated as one department of the Athol Manufacturing Co. Outdoor pneumatic rubber goods are its specialties, but it also makes mattresses and cushions for hospital and domestic use. L. S. Starret is president of the company.

THE RUBBER TRADE IN THE MID-WEST.

(By Our Regular Correspondent)

MID-WEST RUBBER MANUFACTURERS' ASSOCIATION.

The monthly meeting of the Mid-West Rubber Manufacturers' Association, held July 13, at the Chicago Athletic Club, was largely attended. Much interest was shown by the members present in the business of the Association that continues to expand as the membership increases. At this meeting the following new regular members were elected. The Automobile Owners Tire Corporation, St. Paul, Minnesota; The Giant Tire & Rubber Co., Findlay, Ohio; Rotary Tire & Rubber Co., Zanesville, Ohio; The Sponge Tire & Rubber Co., St. Paul, Minnesota. The associate members elected were The Utility Manufacturing Co., Cudahy, Wisconsin, and The Towar Textile Mills Corporation, Toledo, Ohio.

The first annual outing and summer meeting will be held at the Hotel Breakers, Cedar Point, near Sandusky, Ohio, on Monday and Tuesday, August 16 and 17, 1920. The price of tickets has been fixed at $10.

As this is the first general rubber trade outing ever held in the Middle West, where so large a number of the rubber manufacturing plants are located, it has been decided to make the invitation general to everyone in the trade whether members of this association or not.

Cedar Point is an ideal spot for a summer's outing. There are commodious modern hotels, shady groves, amusement parks, a fine bathing beach, and a trip to historic Put-in-Bay, the scene of Commodore Perry's victory, is an added attraction.

It is but a fifteen-minute boat trip from Sandusky to Cedar Point, and boats run on regular schedule from Cleveland and Toledo. The Cleveland boat leaves at 8:30 a. m., arrives at Cedar Point 11:45 a. m. The Toledo boat leaves at 8:15 a. m. and arrives at Cedar Point 1:15 p. m.

The outing committee is as follows: H. S. Vorhis, chairman; E. T. Meyer, F. R. Henderson & Co., Chicago; Paul A. Bloom, Fred Stern & Co., Chicago; C. H. Taveniere, Charles E. Wood, Chicago; G. Matthias, Jr., Mineral Point Zinc Co., Chicago.

MISCELLANEOUS MID-WESTERN NOTES.

H. G. Olivier, formerly associated with the Goodrich and Diamond rubber companies at Pittsburgh, Pennsylvania, and well known in the automobile tire trade through his fifteen years of selling experience, has been appointed manager of the Indianapolis branch of the McGraw Tire & Rubber Co.

H. G. Olivier.

The Altenburg Tire Equipment Co., Davenport, Iowa, has purchased six and one half acres of ground at West Davenport, on the Rock Island railroad, and the new foundry and machine shops now being erected on that site will be ready for occupancy by September 1. The goods manufactured will include complete tire repair equipment and molds, cores and machinery used in the manufacture of new tires. The capital stock of the company has been increased from $125,000 to $150,000.

The Surety Tire & Rubber Co., St. Louis, Missouri, is one of the new companies that are prospering. Two small buildings

have just been completed, and a third one is being started. For over a year the company has been manufacturing inner tubes, and now has begun to make cord and fabric tires of high quality.

The Hannibal Rubber Co., Hannibal, Missouri, has completed its factory buildings at a cost of $150,000, and as soon as the equipment is installed it will start operations. Both cord and fabric tires will be manufactured under the name "Mark Twain;" the inner tube is to be called "Indian Joe," after a Mark Twain character who still lives in Hannibal at the age of 92. Hannibal, it will be recalled, was the early home of the author. The officers of the company are: William J. Richards, president; H. M. Still, vice president; A. E. Gibson, secretary, and S. O. Osterhout, treasurer. Mr. Gibson will also serve as general sales manager and advertising manager.

Mason Scudder, a son of the founder and principal stockholder of the Rawlings Manufacturing Co., St. Louis, Missouri, has been elected vice-president of the company. The company manufactures game-balls of various kinds, including the "Ruko" which was described in The India Rubber World April 1, 1919.

L. N. Burns, who recently became associated with the Racine Auto Tire Co., Racine, Wisconsin, has been made head of the Horse Shoe Rubber Co. of Missouri, the distributing organization for Horse Shoe tires in Kansas and Missouri. Mr. Burns, until January 15, was vice-president and general sales manager of the J. I. Case Plow Works Co., of Racine. The Horse Shoe Rubber Co. of Missouri succeeds the Lindman-Funk Co., distributors, who introduced the "Horse Shoe" tire line in the two states. Offices are already established in Kansas City and St. Louis. Mr. Burns will be directly in charge of all sales in the two states. W. E. McClurg will be vice-president of the new organization and will be in charge of the St. Louis office.

L. N. Burns.

Jacob Warner Culver, who has been promoted to the position of central district manager of the Federal Rubber Co., at Chicago, Illinois, is a native of that State. Born in Galesburg and a graduate of the high school, business college and Knox College there, he first worked in the local postoffice for four years. In 1899 he went to Chicago as a stenographer for the Ayer & Lord Tire Co. For five years he was an accountant for railroad contractors, and for ten years he was a salesman and district manager for the Boston Woven Hose & Rubber Co. Prior to his promotion he had for some time been manager of the Federal company's mechanical rubber goods department.

Mr. Culver is a member of the South Shore Country Club and various tire and rubber trade associations.

A. Daigger & Co., Chicago, Illinois, dealers in rubber ingredients, have inaugurated a free rubber manufacturers' service as an adjunct to their laboratory research department. At its head is an expert chemist and rubber man who is prepared to take up without charge or obligation any problems and technical difficulties pertaining to chemicals, colors and oils submitted by the trade. A market letter including technical notes will be issued from time to time.

The Brunswick-Balke-Collender Co., 623-633 South Wabash avenue, Chicago, Illinois, is making extensive additions to its plant at Muskegon, Michigan. One new group includes four separate buildings in which the cord fabric is impregnated. These buildings have been completed and the machinery installed, at the cost of $1,000,000, so they will soon be ready for occupancy. The company has recently increased its capital stock from $12,000,000 to $56,000,000.

The Athol Manufacturing Co., Athol, Massachusetts, is erecting at Marysville, Michigan, a new plant consisting of main building, store house and churn room, giving about 34,250 square feet of floor space. The most modern ideas of factory building and machine layout are utilized. A hundred men are to be employed. By the middle of August it is hoped that the company will begin the production of a high-class rubber-coated fabric, for use in the manufacture of automobile tops.

The India Tire & Rubber Co., Akron, Ohio, has placed its southern Wisconsin territory under the supervision of Calvin F. Troupe, former branch manager for the Fisk Tire & Rubber Co., with headquarters in Milwaukee, where he will work in direct connection with The Ramler Rubber Co., India distributer in that city.

Work has been begun on the new factory of The Wilson Rubber Co., Des Moines, Iowa, and the accessory factory is already in operation, manufacturing the Wilson "SlaPatch." This company was incorporated December 16, 1918, capitalized at $2,000,000, but active organization work did not begin until the spring of 1919. The executive offices are at 402-403 Hubbell Building, Des Moines, and the plant on the outskirts of the city, at West 63d street, River to River Road, and the Chicago, Milwaukee & St. Paul Railway. The officers are: W. E. Wilson, president and general manager; S. S. Wilson, vice-president; W. G. Richardson, secretary and treasurer. R. A. Torrey is mechanical engineer, and H. E. BeSaw is superintendent.

Some of the leading commercial artists of the country have prepared for the Standard Four Tire Co., Keokuk, Iowa, a series of twenty-six paintings portraying Indian lore and legend, to be used in an advertising campaign. The Indian Chief, Keokuk, who is said never to have broken a promise, once lived in the same locality, and the company has chosen his spirit and character to typify its own policy and aims. Consequently, Indian subjects were chosen for these paintings and the company has been to considerable expense for research work preliminary to their production, in order that they should be accurate in detail as well as characteristic portrayals of Indian life. They are said to compare favorably with the famous Remington paintings of Indians.

The Essenkay Products Co., Chicago, Illinois, has acquired 14 acres of ground at 83d street and Wentworth avenue, on which it will build a plant for the manufacture of its tire filler and rubber substitute known as "Essenkay." The first building, to be of concrete and steel, will be erected at an estimated cost of $300,000. F. D. Mayer is president.

The Hoosier Rubber Co., Mishawaka, Indiana, which manufactures "Service" rubber heels, is a partnership consisting of Ted Nicar and N. V. Robertson. Mr. Nicar was formerly with the Firestone Tire & Rubber Co., Akron, Ohio.

The Synthetic Rubber Products Co., Fort Branch, Indiana, has been making plans for extracting rubber from cactus and expects to have the first plant in operation August first.

"FLEXYDE" FOR MEN'S BELTS.

A material adapted for use as a substitute for leather is called "Flexyde" and is made of rubberized fabric pebbled on one side to imitate the grain of seal leather. It comes in either black or cordovan, but any special grain, color, or thickness can be made on special order. The standard size is 1/32-inch in thickness, in sheets 36 by 36 inches. One of the recent adaptations of this material is for use in the manufacture of men's belts, which are, of course, washable and therefore eminently practical and entirely sanitary. (The Marathon Tire & Rubber Co., Cuyahoga Falls, Ohio.)

THE RUBBER TRADE IN OHIO.

By Our Regular Correspondent.

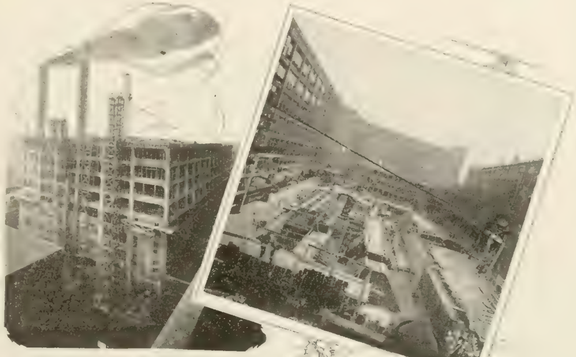
AKRON NOTES.

One of the largest building expansions in the rubber industry at present is that of The B. F. Goodrich Rubber Co. at Akron. New construction is in progress which will increase the size of the plant twenty per cent and cost, with the new equipment and machinery, in excess of ten million dollars.

The new buildings will provide 779,000 square feet additional floor space, making a total of 4,554,304 square feet devoted to the manufacture of tires, hose, boots and shoes, and other rubber goods. Several thousand additional workers will be required next year to turn out the increased production planned.

The largest of the new buildings under construction is an eight-story warehouse for raw materials with 530,000 square feet of floor space. When completed it will be the largest factory building in the city. The second largest building will have nearly 200,000 square feet and will be used exclusively for tire building.

Other new buildings being erected include a giant water softening plant, an electric current transformer station, a large refrigeration building, and an extension to the boiler house of Mill 2. In spite of annoying delays in securing materials the work is going rapidly ahead, day and night, and it is expected that the program will be nearly completed before winter.



This New Building Expansion Provides 779,000 Square Feet of Additional Floor Space, Making a Total of 4,554,304 Square Feet Devoted to the Manufacture of Goodrich Products

This new construction emphasizes the steady growth of the Goodrich company since it was organized fifty years ago, many years before any other rubber factory was opened in the "Rubber City." The original plant of the Goodrich company was a building 40 by 100 feet and only 35 employes were on the first pay-roll. To-day this original building could be tucked away and lost in any one of a dozen of the company's buildings. The force of 35 employes has grown to an army of 28,000 men and women.

An opportunity for employes of The B. F. Goodrich Rubber Co. to become holders of the company's common stock and to share in its profits is afforded by an employe's stock subscription plan recently approved by the company's executive committee.

The stock will be sold to the employes for $65 a share on weekly payments of 25 cents, each employe being allowed to buy one share for each $300 of his annual earnings. Stock will be sold in this way only to employes who have been with the company for three months or longer.

In the working out of the company's plan, stock purchased by the employe can be paid for at the end of three years and 24 weeks, even though the payments during this period will total only $44.98 per share. Accumulated stock dividends and service credits will make up the difference between this amount and the stock purchase price plus interest.

Every time the company pays a dividend on its common stock it will credit a like amount toward the payment of each share of stock on which employes are making payment. At the present dividend rate, such dividends will amount to $21 per share during the payment period.

The employe will receive through the service credit plan an additional credit of $6 on the payment of each share purchased. This service plan provides $1 credit on each share a year from date of first payment, $2 at the end of the second year, and $3 at the end of the third year. The service credits will be given even after the stock is paid for. At the end of the fourth year, $4 cash will be given on each share held and at the end of the fifth year, $5 cash. This will reduce the net amount cash paid for the stock of $35.98 per share.

The Akron Gear & Engineering Co., operating a machine shop at the corner of South and High streets, Akron, is contemplating building a large modern machine shop on its property con-

sisting of four and one-half acres of land on East Market street, with frontage near Martha avenue. The company manufactures all kinds of gears as well as rubber machinery, cores, and molds. Contracts for the new structure will be let at an early date. The officers of the company are: J. Asa Palmer, president; W. F. Warden, vice-president; W. J. Frank, secretary and assistant treasurer; Otis E. Prier, treasurer and assistant secretary; T. A. Seacrist, general manager; J. R. Triplett, sales manager; William A. Brubaker, superintendent and mechanical engineer. The above, in addition to N. C. Stone, president of the National City Bank, Akron, comprise the board of directors.

During the past month the men on the Akron city street-car lines struck for increased wages and the rubber companies, in order to bring their operatives to work, were compelled to organize one of the greatest truck transportation systems ever devised in the city. Sufficient warning of the coming of the strike was given and the whole emergency system of transportation was completed and officially announced in factory publications at least one week before the men actually went out.

Another opportunity was presented by the coming of the strike to show the importance the automobile and the truck holds in the business world of to-day. Reports from the various factories indicate production was affected little, if any.

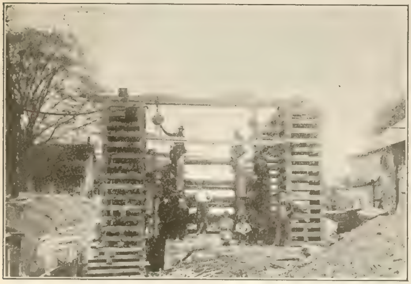
Ralph Upson, C. R. Johnson and C. M. McCreery, all in the aeronautical department of The Goodyear Tire & Rubber Co., and their wives, set a new record when they took their Fourth of July picnic dinner in a free balloon several thousand feet in the air.

More than 600 factory foremen were guests of H. S. Firestone, president of the Firestone Tire & Rubber Co., at an outing given on Mr. Firestone's farm the latter part of June. It required a line of automobiles more than a mile and one-half long to transport the men to the farm. The day was spent in sports of various kinds, followed by a country dinner. The outing this year was the seventh given the foremen by Mr. Firestone.

John Gammeter, of the experimental department of The B. F. Goodrich Co. has been named a member of the newly created State Aviation Commission.

F. W. Work, brother of B. G. Work, president of The B. F. Goodrich Co., was grand marshal of an Independence Day parade in Akron, Monday, July 5. Approximately 8,000 persons were in line.

Plans for an aviation exhibition to be given by the Akron Flying Club in the fall are being discussed. The plans provide for a more elaborate show than was held at Wright Field here recently.



IN ORDER TO SAVE TIME AND TO COMMENCE PRODUCTION AT THE EARLIEST POSSIBLE DATE IN HIS NEW PLANT AN ENTERPRISING RUBBER MANUFACTURER IN THE AKRON DISTRICT INSTALLED THE CALENDER BEFORE THE BUILDING WAS ERECTED.

H. C. Berry, of the Berry Airship Co., of California, has spent some time in Akron superintending the building of a dirigible by The Goodyear Tire & Rubber Co. for himself. The new machine will embody several features patented by Mr. Berry which will increase the speed of dirigibles.

Daily flights to Cleveland were made by airships from Akron during the aviation show held in that city July 2-7. The "pony" blimp, the only one-man dirigible on the market, was among the ships which made the flight.

FIRESTONE WINS INDUSTRIAL TRACK CHAMPIONSHIP AT PITTSBURGH, PENNSYLVANIA.

1. THE FINISH OF THE 100-YARD DASH, MATT BROWN ON THE LEFT. 2 JOHN MILLER TAKING SECOND IN THE 440-YARD DASH. 3. PETERSON BRINGING FIRESTONE'S COLORS HOME FIRST IN THE MILE RELAY, THE ISSUE WHICH PRACTICALLY DECIDED THE OUTCOME OF THE MEET. 4. THE RUNNING BROAD JUMP, IN WHICH PITTENGER TOOK FIRST AND MILLER THIRD.

A total of 4,200 men and women enrolled in the Americanization classes conducted this year in Akron under the auspices of the Board of Education. E. C. Vermillion, formerly in charge of the Firestone Americanization work, is director. A total of 136 classes was served by 105 teachers. Classes were held in basements of churches, homes, factories and in rooming houses. The outlook for next year is still brighter.

The Industrial Salvage Co., organized by George W. Sherman, formerly in charge of the salvage department of The B. F. Goodrich Co., is upon a paying basis and will be able to declare a small dividend this year. The company has dealt largely with salvaged boilers and machinery during the past year. The war left a large amount of machinery in factories which is now useless in its present location and the company has been busy buying it up and shipping it to other locations where it is needed. The plan to make a house-to-house collection of salvage was postponed because of the amount of business coming to the company.

The Miller Rubber Co., Akron, increased its sales 63½ per cent during the six months ended July 1, 1920. From 1915 to 1919, the company's sales have increased 1,300 per cent. The business of the present year, it is estimated, will total $50,000,000.

The India Tire & Rubber Co., Akron, has made the following appointments: J. E. McGinnes, formerly branch manager for the Firestone Tire & Rubber Co. in Milwaukee and manager of

tire sales for The General Tire & Rubber Co., Akron, has been placed in charge of sales promotion work and K. C. Burtscher, well known in railroad circles, has been appointed traffic manager. He was formerly connected with the Wheeling and Lake Erie railroad and with the traffic department of The Goodyear Tire & Rubber Co., Akron.

The Supreme Cord Tire & Rubber Co., Akron, Ohio, with an authorized capital of $2,000,000, is erecting a new plant on Home avenue. The main factory building is 60 by 300 feet, of brick and steel, and a power plant, 40 by 50 feet, is of the same construction. The officers and directors of the company are:

R. C. Witwer, president; A. G. Kaufmann, vice-president; Charles O. Patier, secretary-treasurer. The other members of the board of directors are: L. C. Koplin, William J. Kaufmann, Hon. Thomas H. Moore, S. W. Sweet, P. E. Welton, J. L. Swartz, B. L. Eaton, and W. B. Campbell.

MISCELLANEOUS OHIO NOTES.

Jay Chamberlin has been appointed manager of the Cleveland branch of the Pennsylvania Rubber Co., Jeannette, Pennsylvania. For the last two years he has represented the company in the Chicago territory.

The Pharis Tire & Rubber Co., Newark, Ohio, is erecting a 100 by 120-foot, three-story brick and steel addition and a new power house, and adding 100 per cent to the machinery equipment for the purpose of increasing production to 1,000 tires and 1,000 tubes daily. This company was one of the first to build 30 by 3½ clincher cord tires, and the growing business, principally with large jobbers, requires additional factory facilities. By November the company expects to be building all sizes of cord tires. The officers are: A. R. Lindorf, president; C. H. Otto Meyer, vice-president; Charles O. C. Lindrooth, secretary; R. S. Wyeth, treasurer; Carl Pharis, general manager.

The Hercules Rubber Corporation, with main offices at 908 Union Central Building, Cincinnati, Ohio, has purchased 35 acres of land on which it will erect a modern factory and power plant for the production of its special airless inner tube.

The Columbus Tire & Rubber Co., Columbus, Ohio, is installing machinery for the purpose of manufacturing fabric tires, in addition to its equipment for the manufacture of cord tires. It expects to produce fabric tires about August 1, 1920.

The Kee-Spears Rubber Co., Clinton, Ohio, which was incorporated November 3, 1919, to manufacture a general line of molded and mechanical rubber goods and hard rubber goods, including interior doors, door and window casings, room moldings, etc., has purchased a factory and is nearly ready to begin manufacturing. An additional building will be built at an early date, which will double the capacity of the plant. The officers of the company are: George A. Griffiths, president and general manager; W. W. Spears, vice-president; Culley B. Hall, secretary; A. J. Kee, treasurer; directors—Dempsey Lowe and Benjamin Blackmore.

Charles H. Wheeler has been elected a director of The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio.

C. D. Rockwood, purchasing agent of the Mason Tire & Rubber Co., Kent, Ohio, has returned from the Far East, which he visited in the interest of the Mason Rubber Plantations Co. He found conditions there very promising. J. P. Matthews, former purchasing agent of the company, remains at Singapore as far eastern representative.

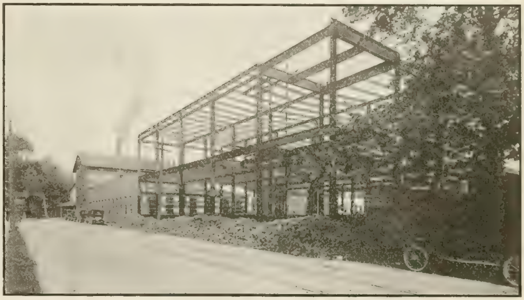
The Premier Rubber & Insulation Co., Dayton, Ohio, has increased its capitalization from $150,000 to $250,000, owing to the great increase in business. The plant is now running night and day, in order to meet the heavy demands for hard rubber and bakelite products. The newly-elected officers of the company are: William Grether, president and treasurer; William F. Grieser, vice-president; John H. Shively, secretary.

The above-named, with Joseph Westendorf and Harry H. Gerstnor, comprise the board of directors. Henry Spatz has been appointed factory manager.

The National Rubber & Specialties Co., Chickering avenue and C., H. & D. Railway, Cincinnati, Ohio, manufacture a line of cements for bicycle, motorcycle, and automobile tires, as well as braziers, vulcanizers, enameling ovens, etc., for tire repair work.

The population of Kent, the home of The Mason Tire & Rubber Co., has been announced by the census bureau as 7,070. In 1910 the village had a population of 4,488. The increase was 57.5.

Ohio C. Barber, match king, capitalist and agriculturist who died in January, left an estate of more than $5,000,000, it was shown, when his will was offered for probate recently. Some of the buildings on the Anna Dean farm, containing 1,000 acres, are being converted into dormitories and manufacturing buildings. The Babcox-Wilcox Co. of Barberton has leased one of the buildings for dormitories for additional men.



New Building for the Pharis Tire & Rubber Co.

GENERAL HILLS, A NEW AKRON SUBURB.

An unusual scheme to beat the high cost of homes and at the same time solve the housing problem has been put in effect by the General Tire & Rubber Co., Akron, Ohio. The employes of the company, by adopting a plan of W. O'Neil, general manager, took over a 243-acre tract of land on the Massillon road about 1¼ miles from the General plant and formed a development syndicate with Mr. O'Neil as trustee. This is believed to be the first time that the employes themselves have got behind a home-building project and undertaken its financing and development.

One thousand homes will be constructed to cost $5,000 to $6,700 and compare identically with property which has been bringing $9,000 or more. Quite a sum of money is being saved by finding various men in the factory who have had experience in lumbering, road building and construction work, and these men were put in charge of the work with which they were familiar, thus eliminating contractors.

When completed the section will be known as General Hills.

It lies about 500 feet from Springfield lake, overlooking the lake and the valley. All conveniences, such as electricity, sewer, pavements and sidewalks, will be provided. Plans call for the formation of a community waterworks. A business center has been laid out and buses will operate from the community every 30 minutes.

In working out the General Hills plan, enabling the men to finance the enterprise, a double purpose has been accomplished, because while overcoming the financial handicap in home building, the men at the same time have been given something to take the place of unwise investments in the numerous wildcat stocks and other promotions which have been sweeping the country and which have contributed to the unrest of good workmen.

A DESIGNER OF RUBBER MACHINERY.

Curt Kuentzel, experimental engineer with The B. F. Goodrich Co., Akron, Ohio, was born in Erfurt, Germany, in 1880. After studying at the Technical High School in Charlottenburg and the universities of Jena and Berlin, he graduated in 1903.

Curt Kuentzel.

His first position was with Siemens & Halske Gummiwerke in Berlin, and he was later with the Gummiwerke Oberspree of the General Electric Co., in Berlin, Gummi & Kabelwerke, Dr. Cassirer & Co., in Charlottenburg, and Süddeutsche Gummiwerke, in Mannheim.

In 1909 he came to America as assistant superintendent in the insulated wire department of the Diamond Rubber Co., Akron, Ohio. His training and inclination tended toward development work rather than management, and since that time he has held the positions of experimental engineer with the Goodyear Tire & Rubber Co., Akron, Ohio, and the Republic Rubber Co., Youngstown, Ohio, and is at present engaged in that capacity with The B. F. Goodrich Co.

In 1917 he planned and installed the Neumaticos Nacional, a rubber factory in Barcelona, Spain, of which he is now temporary manager. After a stay of a few months this year he will return to The B. F. Goodrich Co.

The patent records furnish eloquent testimony to Mr. Kuentzel's initiative and activity. He is the inventor of numerous rubber manufacturing machines, devices and processes, especially in the tire building branch of the industry.

THE RUBBER TRADE ON THE PACIFIC COAST.

By Our Regular Correspondent.

LOS ANGELES NOTES.

The Samson Tire & Rubber Co., 333 Pico street, Los Angeles, has just shipped a cargo of tires and tubes to San Salvador, Peru, and New Zealand, and is planning a considerable extension of its export trade.

The Pacific Rubber Co., coast distributer of Horseshoe tires, has moved into its new general offices at 415 East 8th street, Los Angeles, a commodious, two-story, up-to-date building. According to Roy R. Meads, president and general manager of the company, the San Francisco branch has within a few months increased its sales several hundred per cent.

The "Wingfoot Clan" is the title of a bright, new weekly shop paper which made its début at the Los Angeles Goodyear plant in July. It is in charge of F. H. Fuller, manager of the personnel department of the Los Angeles factory.

The Keaton Tire & Rubber Co., maker of the Keaton non-skid tire, has established a branch salesoffice in a new two-story building of its own at 1337-1339 South Flower street, Los Angeles. Alan T. Tarbell is in charge.

The first tires or tubes to be shipped east from Los Angeles have been sent out by the George W. Eno Rubber Co., of 1026 South Los Angeles street, Los Angeles, which recently forwarded 3,600 inner tires, as the endless liners made by the company are called, to Milwaukee. The same concern is preparing to ship a carload of the liners to New York at an early date, and will begin the manufacture of tubes in August.

M. C. Hale, president of the United States Compression Inner Tube Co., Tulsa, Oklahoma, announced on July 9 that his company had finally decided to establish its West Coast factory in Burbank, a suburb of Los Angeles, California, and had bought a site of 12½ acres there. Work on the factory will be started at an early date. A pneumatic tube, said to be practically punctureless, is the company's chief product. At the company's main plant in Oklahoma 2,000 tubes and 200 tires are turned out daily. C. R. Privett has charge of sales. The company's Los Angeles office is at 411 Citizens' Bank Building, and it also maintains a sales branch in Pittsburgh, Pennsylvania.

R. M. Merriman will be technical superintendent of the new factory of the Fabri-Cord Tire Co. about to be erected at San Pedro. Mr. Merriman held a similar position with The B. F. Goodrich Co. for twelve years. At present he is in Akron, Ohio., buying machinery, etc., for the new plant. He holds many valuable patent rights on tires, tubes, and machinery.

Of much interest to local rubber manufacturers who are anxious to get materials cheaply and quickly from the East, was the recent arrival at Los Angeles of the *Artigas,* the first vessel to be sent here from Philadelphia, via the Panama Canal, by the North Atlantic & Western Steamship Co.. The voyage was made in 18 days and 18 hours. Three other vessels will soon be placed in service.

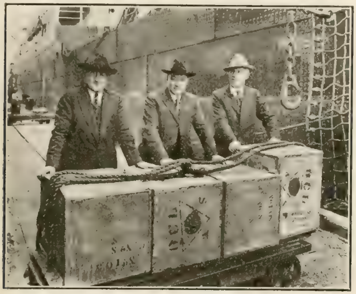
James H. Christian.

James H. Christian, president of the Fabri-Cord Tire Co., the latest rubber manufacturing enterprise in Los Angeles, California, was the first president of the Perfection Tire & Rubber Co., of Fort Madison, Iowa; and patented the well-known asbestos breaker strip. Having disposed of his interests, he took up cotton growing in Arizona, later formed the San Gabriel Reservoir Co. in Southern California, and finally the Fabri-Cord Co. Mr. Christian was born in 1866 at Mt. Carroll, Illinois, and has been in the real estate and building business in Detroit and Chicago.

The Kelly-Springfield Tire Co., the Goodyear Tire & Rubber Co., the Firestone Tire & Rubber Co., The B. F. Goodrich Rubber Co., and the United States Rubber Co. helped to finance a

recent ship-by-track run of 636 miles between Los Angeles and Imperial Valley, in the demonstration of the value of motor freighting under adverse conditions.

A direct shipment of 600 tons of crude rubber valued at $750,000, from the Goodyear plantation in Sumatra, arrived in Los Angeles last month by the Los Angeles-Pacific Steamship Co.'s freighter, the *West Hika,* and is the first to come to the local Goodyear plant through the Los Angeles harbor. The illustration shows C. H. Kelly, W. J. Yarnell, Goodyear crude rubber department, C. W. Case, traffic manager, and the first sling of rubber to be unloaded. It is said that the Goodyear plant will use 18,000 tons of rubber annually when running to capacity.



Plantation Rubber Cargo Arrives at Los Angeles.

It is stated at the Goodyear works that, while 2,000 are now employed, the company has applications from 7,000 for positions in the new plant. Eastern rubber workers are accordingly advised to hold their jobs and not to migrate to Southern California for a while at least.

J. O. Ward, manager of the Los Angeles branch of the Miller Rubber Co. of California, at 1233 S. Hope street, Los Angeles, is making a trip through the East and will spend some time at the Miller factory in Akron.

The California ad Arizona sales of Midco tires, manufactured by the Mid-Continent Tire Co., of Wichita, Kansas, will be handled by Bradford-Fuller, Inc., Figueroa and Eighth streets, Los Angeles.

SAN FRANCISCO NOTES.

B. M. Schreckengost, general factory representative of the Globe Rubber Co., of New York, who recently made an inspection tour on the Coast, reports that his business shows a healthy increase.

The Luthy Electric Storage Battery Co. has moved into its new building on Geary street, near Larkin, San Francisco. J. P. Schiller is in charge.

The Federal Rubber Co. of Illinois, Cudahy, Wisconsin, is erecting a new five-story warehouse and office building at Second South Park and Taber Place, San Francisco, according to E. L. Rettig, Pacific Coast manager for the Federal company. A large stock of tires will be kept here for Coast and export trade. The building, which will be completed this fall, will have approximately 70,000 square feet of floor space, and will cost about $125,000. One of its features will be a special track extending through the building which will greatly facilitate the handling of incoming freight.

Good headway with its new building plans is reported by the Coast Tire & Rubber Co., of Oakland. A building is being erected on East 12th street, between 48th and 50th avenues, and machinery and general equipment have just arrived from the East. The company has been having its cord and fabric tires made in Akron, but after September 1 it expects to do all its own manufacturing.

The exclusive agency for Owen cord, fabric, and solid tires for Northern California and Nevada has been acquired by the Owen Pacific Tire & Rubber Co., of 135 Hyde street, San Francisco, for which Harry A. Parker is sales manager.

George E. Machen and J. Dickson Smith have formed the Machen-Smith Tire Co., 1240 Van Ness avenue, San Francisco, specializing in half-sole tire work.

L. M. Simpson, for two years manager of the clothing and footwear department of the Los Angeles branch of the United States Rubber Co., has been transferred to Sacramento, where he will have entire charge of the U. S. R. Co.'s branch in that city. Mr. Simpson is a graduate of the University of Illinois, and very popular with his Los Angeles associates.

The Kelly Tire Service Co. has moved its headquarters from San Francisco to Stockton.

SOUTHWESTERN NOTES.

That success has followed the introduction of the bonus and premium plan of compensating workmen is the report of the Spreckels "Savage" Tire Corporation, San Diego. The system provides a premium for workmen making a required number of points contingent upon the work to be done, which must meet a certain standard. On the other hand, a penalty is imposed on workers for manifest carelessness. A decided improvement in the quality and quantity of the output and a better morale are said to be the outstanding results.

As many as 25,000 toy balloons are being made daily by the Pacific Balloon Co., of Riverside, a branch of the Howe-Bowman Balloon Co., Newark, New Jersey. Chain stores are among the largest buyers of the goods. Harold A. Dodge is the manager of the factory.

The entire town of Marinette, Arizona, fourteen miles northwest of Phoenix, and 7,800 acres of adjacent land have been bought by the Southwest Cotton Co., a subsidiary of the Goodyear Tire & Rubber Co. This territory now brings the total amount of land owned by the company and to be used for raising long staple cotton for tire fabrics up to 36,000 acres. This does not include 20,000 acres that have also been leased by the company for the same purpose, but which are held for future needs. The company is planning to erect dwellings on the newly-acquired land similar to those provided for the 2,000 employes who work on the company's plantations at Litchfield and Goodyear in the Salt River Valley.

Of the 30,000 acres planted to cotton in the San Joaquin Valley, California, most of it has been devoted this year to the raising of the Pima long-staple cotton needed for automobile tires. A government crop expert reports the cotton there as further advanced than in any other part of the Southwest. In experimental patches last year the Pima cotton in the valley averaged 520 pounds to the acre, but allowing 500 pounds to the acre for 1920 and with the cotton selling at $1.50 a pound, a return of $750 on each acre can be counted upon. The Mexican boll-weevil has done considerable damage to short-staple cotton in Texas and other Southern states, but so far the long-staple cotton crop in the Southwest has escaped injury.

NORTHWESTERN NOTES.

According to C. H. Boyer, western district manager for the General Tire & Rubber Co., of Akron, Spokane, Washington, is being considered as a probable site for a Pacific Coast branch factory.

R. S. De Orell, formerly with the Hartford, Knight, and Lee tire concerns, has been appointed superintendent of the Washington Tire & Rubber Co., which started in Spokane two years ago, and is now turning out 75 Western States tires a day.

The Western Rubber Co., Tacoma, Washington, has begun operations in its new plant. Tires are being manufactured in limited quantities only and chiefly for testing purposes, but the plant and equipment are equal to a capacity of 1,000 tires and 1,000 tubes a day.

The Tri-State Tire Co., distributer of Perfection tires, has leased a new building being erected at the corner of 10th and Stark streets, Portland, Oregon. A few stores in the building, which is 108 by 120 feet, will be subleased to accessory dealers, but the remainder will be occupied by the Tri-State Tire Co. A service station will be maintained, with a repair shop in the rear, reached by a driveway from the street.

Barry Wilson, formerly with the United States Rubber Co., and well known in the trade in San Joaquin and Sacramento Valleys, has taken charge of Firestone's Nevada tire business, with office at Reno, Nevada.

TIRE REPAIRING ON THE PACIFIC COAST.

Coincident with the rapid development of the automobile trade on the Pacific Coast, and influenced in no small degree by the rising cost of tires, has come about a notable growth in the tire-repairing industry. A year ago there were scarcely 400 vulcanizing shops on the Pacific coast, but to-day there are close to 600, over one-half the number being in California.

PIONEER PNEUMATIC-TIRED TRUCK.

A Packard truck equipped with Goodyear cord pneumatic tires has established the world's record for motor trucks in a coast to coast run from Los Angeles, California, to New York City. The total distance of 3,451 miles was covered in a total elapsed time of 13 days, 13 hours and 15 minutes. The actual running

GOODYEAR TRANSCONTINENTAL TRUCK AND MEN WHO DROVE IT FROM NEW YORK TO LOS ANGELES. INSERT, LEFT TO RIGHT, HOWARD SCHOLDER, HERBERT TEMPLE.

time was 8 days, 12 hours and 55 minutes, and the average speed was 15.8 miles. Not a single tire change was made on the trip, which demonstrates the practicability and advantages of pneumatic tires in truck transportation.

As direct evidence that pneumatic tires prolong the life of a truck, the history of this one is interesting. Built in 1918, it has been in continuous service a little more than two years and has traveled approximately 120,000 miles. It has a three-ton chassis with a five-ton motor and carries a big enclosed body in which is a sleeping bunk, as well as room for a consignment of freight.

Its initial service was on the Akron to Boston express route, carrying Goodyear products to eastern points and bringing back fabric from mills, round trip 1,500 miles, time 5½ days. In 1918 and 1919 it was part of the motorcade carrying boy scouts on long tours through the eastern states. In the autumn of 1918 it made the first transcontinental trip from Boston to San Francisco and return carrying a consignment of airplane tires, round trip, 7,763 miles. Its second transcontinental trip was made in July, 1919, with the army motor convoy to San Francisco over the Lincoln Highway and return, carrying the Goodyear band which furnished music for the soldiers in convoy.

CANADIAN NOTES.

The Premier Tire & Rubber Co., Limited, Hamilton, Ontario, has been incorporated, under the laws of Ontario, with letters patent granted January 10, 1920. A fectory building, one story in height, 50 by 150 feet, is going up rapidly at Beamsville, Ontario, probably to cost $27,000. The company hopes to be turning out tubes at the rate of 400 to 1,000 a day by January, 1921. The officers are: Heber Tremaine Pyke, president, and William S. Attwood, vice-president. Estelle Margaret Pyke is a director, in addition to the above-named, and Messrs. Barr & McBride have been appointed auditors.

F. M. Morgan has returned to the Ames-Holden-McCready System, Regina, Canada, as manager of the Saskatchewan division, with headquarters at Regina.

Following the return of J. Westren, general manager of the Dunlop Tire & Rubber Goods Co., Toronto, Ontario, Limited, from England and the Continent, W. B. Northam, general sales manager of the Dunlop company, has sailed for England to be gone two months.

The building operations and the installation of the machinery in the new cord tire plant of the Dunlop Tire & Rubber Goods Co., Limited, at Toronto, are nearly completed and manufacturing will probably begin early in August.

The Dunlop Tire & Rubber Goods Co., Limited, Toronto, Canada, has inaugurated an employes' insurance plan as an evidence of their interest in the welfare of their employes and their goodwill toward them. More than 2,000 people are insured for amounts ranging from $500 to $2,500 according to length of service. The policy increases as the term of service lengthens, and the premiums are paid by the company, the employe being under no obligation. However, in the event of an employe becoming totally and permanently disabled before the age of sixty he or she receives the proceeds of the policy.

In 1919, Canadian automobile factories manufactured 94,000 motor vehicles and sold more than $100,000,000 worth. There were 325,000 automobiles registered in the Dominion, compared with about 90,000 in 1915. The demand for motor trucks is increasing.

TARIFF NOTES.

Modifications of existing tariffs have been made in several European countries: Belgium, from June 21 on, adds to the tariff duties for rubber tires a "coefficient of increase of 2." Poland until further notice suspends the duties on rubber packing. Portugal imposes an export tax, from June 5 on, of 10 per cent ad valorem on wares of rubber, gutta percha, balata and similar products in any condition. A license to export is required.

THE ALL AMERICA CABLES CO. HAS OPENED A NEW CABLE service connecting Rio de Janeiro and Santos with the United States, and the rate from New York to Brazil has been reduced from 85 to 65 cents. The new cable system embraces over 22,500 miles of cables and land lines, and has recently entered Bolivia. Cables from Colon to points on the north coast of Colombia are now being laid, and soon a triplicate cable from Ecuador to Peru will be in operation.

S. YAMADA, WELL KNOWN IN THE JAPANESE RUBBER TRADE AND formerly director of the "Gomu-Sekai" (Rubber World), has been appointed editor-in-chief of the "Gomu Jiho" (Rubber Times), the monthly journal of the Tokio Rubber Association.

THE OBITUARY RECORD.

PRESIDENT OF THE PENNSYLVANIA RUBBER CO.

Harry Wilfred DuPuy, president of the Pennsylvania Rubber Co., Jeannette, Pennsylvania, died July 4 at the French Hospital, New York City, where he had been taken following a stroke of apoplexy eleven days previously while on a visit to New York. He was only thirty-nine years old. For the past year he had been in poor health and had planned to sail for a trip to Switzerland with his family on July tenth.

Harry W. DuPuy.

Born at Pittsburgh in 1880, Mr. DuPuy was educated in the high school at Pottstown, Pennsylvania, and in 1903 was graduated from Yale University with the degree of B. A. The following year he started in business with the Pennsylvania Rubber Co., first in the testing department, then advancing to assistant treasurer, later treasurer, and finally to president and treasurer in 1912.

Before the United States entered the war, Mr. DuPuy trained at Plattsburg, New York, for his commission, and entered the service in 1917. The arduous nature of the training which he again underwent, both at Plattsburg and Fort Niagara, it is said, left its permanent imprint upon him, and was indirectly the cause of his illness. He was a member of The Rubber Association of America, Society of Automotive Engineers, Association of National Advertisers, Aero Club of America and Motor and Accessory Manufacturers.

Mr. DuPuy is survived by his father, Herbert DuPuy, chairman of the Pennsylvania company's board of directors, and by his widow and son, all of whom live in Pittsburgh, where the family is active both in a social and business way. His brother, Charles M. DuPuy, is vice-president of the Pennsylvania company.

A PROMINENT SHOE TRADE JOURNALIST.

Frederic Farley Cutler, who was prominent in shoe trade journalism, died July 16, 1920, at his home in Newton Centre, Massachusetts. Since last December illness had prevented his being active in business. He was in his fifty-fifth year.

Mr. Cutler was born in Boston in January, 1866, and graduated from the Boston Latin School in 1885, but, after taking the entrance examinations for Harvard University, decided to enter business and took a position with the leather firm of Proctor, Hunt & Haskell. Five years later he entered the field of trade journalism and became manager of the Shoe and Leather Reporter Company, and in 1901 became president and treasurer of this company, afterward becoming the owner. In 1898 he established "The Shoe Retailer," and was also owner of that publication.

Mr. Cutler held membership in The Country Club, the Bræ-Burn Country Club, Algonquin Club, Boston Athletic Association and in several other clubs in Newton, also in Hyannis, where he had a summer home, and at Pinehurst, North Carolina. He was also a member of the Masonic fraternity.

A PROMINENT GERMAN RUBBER MAN.

The last copy of the *"Gummi-Zeitung"* to hand contains the news of the death at the age of 68 years of Commercial Councilor Friedrich Bayer, second chairman of the board of the Farbenfabriken Friedrich Bayer & Co., in Leverkusen, near Cologne, and son of the founder of the enterprise.

UNITED STATES IMPORTS AND EXPORTS—NEW CLASSIFICATION.

Tables showing the imports into and the domestic exports from the United States in the calendar year 1919, stated in the terminology of the classification adopted by the International Statistical Congress, are issued by the Division of Statistics of the Bureau of Domestic and Foreign Commerce.

Quantities are shown in United States denominations and values in dollars and in "Pan Americanos," a proposed international money of account equal to one-fifth of a dollar. The import values represent the wholesale price of the merchandise at the time of exportation in the foreign countries from which imported, including the value of containers. The value of exports represents the cost of the merchandise at the time of exportation in the ports of the United Staes from which shipped. The ton equals 2,240 pounds.

The classification and figures relating to rubber are:

III. Materials, raw or partly manufactured.
62. India rubber and substitutes (including scrap). Unit of quantity, pound; units of value, dollar and Pan Americano.

Calendar year 1919.	Pounds.	Value. Dollars.	Value. Pan Americanos.
Imports	576,708,524	221,626,122	1,108,130,782
Exports	13,362,685	1,648,931	8,244,655

IV. Manufactured articles.
132. Rubber manufactures.

		Dollars.	Pan Americanos.
Imports		1,004,051	5,020,255
Exports		46,950,625	234,753,125

PRINTERS' ROLLERS OF RUBBER.

It has been known for more than a generation that the printer's roller is an unsatisfactory product. Made of glue, molasses and glycerine, it spread the ink well, but was subject to changes of temperature and must be often renewed. Makers of these composition rollers all had their own special formulas. The simplest were about equal parts of glue and molasses for summer but for winter twice as much glue as molasses. One formula called for the addition of a little Paris white, while another maker added linseed oil, whiting and rosin.

From time to time rubber manufacturers sought to oust the glue and molasses roller by supplying one of rubber. For a long time these attempts were futile. Success has, however, at last been attained.

The B. F. Goodrich Co. are now supplying a roller of rubber, the "One-Set," that is soft and pliable, not destroyed by ink, distributes perfectly, is unaffected by winter's cold or summer's heat, requires no adjusting when properly set, and outlasts by a big margin the old-time roller. Another signal triumph for rubber.

BENT RIMS CAUSE MUCH TIRE TROUBLE.

Many motorists, were they to examine the wheels on their cars, would be surprised to notice that their rims are bent along the edges. Bent rims are a direct cause of rim cuts, of tires blowing from the rim, and of the breaking of the wire cables at the base of the tire.

When the wheel hits a frog or a switch of a street car track or a hole in the road, there is a tendency to flatten the rim, especially if the tire is under-inflated. The support of the rim is essential to the life of a tire. If it is bent so that it does not fit the tire and allows the sidewalls to bulge, trouble is to be expected unless immediate precautions are taken.

The Miller Rubber Co., Akron, Ohio, issues a timely warning that by truing-up their rims, motorists can prevent much tire trouble. A good rule to follow is to have both tires and rims inspected fortnightly. When rim trouble is found, it may usually be corrected by careful tapping with a ball hammer.

The State Savings & Trust Co., Akron, and the Merchants National Bank, Massillon, have been appointed receivers of the Biltwell Tire & Rubber Co., Barberton, Ohio, due, it is said, to money stringency, though the company claims solvency.

The Rubber Trade in Great Britain.

By Our Regular Correspondent.

TRADE generally shows a falling off from the activity of last year and the opinion is freely expressed that we are in for a period of slackness all around. Another claim for increased wages is confronting the managements of the works and the indications are that the matter will not be easily settled.

The development of rubber planting on the Amazon is a matter of interest to many besides those primarily concerned. The increase in the yield in the last ten years shows the latent possibilities of this district in the future for making up any deficiencies in the Eastern supply which may be caused by the spread of pests like the worm pest. This appears to be unknown in Brazil where the main bar to progress seems to lie in transport and labor difficulties, which will have to be overcome if the rubber is to compete economically with the product of the Far East. With regard to quality, I have not seen any definite statement as to whether the Brazilian plantation rubber ranks equally with the product of the wild trees in the same locality. If it does, then it would follow that the age of the tree is not a prime factor. But if it does not, one would still expect the plantation rubber grown in its original home and presumably coagulated by the native method to be free from the irregularities associated with the Far Eastern product.

Certain seers predicted a shortage in the supply of raw rubber for the world's requirements during the current year. There is no sign of this yet, judging by market quotations, and it may be taken that until world conditions get back to normal—always supposing there are not a series of revolutions—what may be considered the legitimate trend of trade will not be observable. No doubt a lot of people want rubber in some form or other, but they have got to pay for it and this is just where the difficulty comes in.

There is general agreement among manufacturers that business is very quiet at present and buyers seem to be waiting until sales are forced by the difficulty, monetary or otherwise, of holding large stocks. An interesting market feature which is causing comment is that Fine Hard Pará is quoted within a half penny of the price of plantation rubber and I have heard the opinion expressed that the demand will go up. It seems doubtful, however, if this will eventuate, because if both were purchasable at, say two shillings per pound, allowing for the loss on washing alone, the Brazilian would be two shillings sixpence per pound and the now increased cost of washing and drying have to be added to this.

A matter which is of deep concern to the trade is the recent death of W. G. Wilson, secretary of the India Rubber Manufacturers' Association and Joint Secretary of the National Joint Industrial Council of the Rubber Manufacturing Industry. Mr. Wilson was only forty-four years of age and there can be little doubt that he over-taxed his strength in his devotion to the interests of his duties during the strenuous times of the last few years. It will be by no means easy to fill his place.

UNITED RUBBER PRODUCTS CO., LIMITED.

The United Rubber Products Co., Limited, which has a capital of £250,000 in shilling shares, owns the Urpco works of the New Urpco Rubber Co., Manchester, and has lately obtained control of the rubber works of G. W. Laughton & Co., Limited, of Clayton, Manchester. A certain amount of mystery attaches to the business which is being carried on, this being associated with some recent method of utilizing waste rubber. Louis Alexander, who was prominent in the promotion of the Sorbo Rubber Sponge Co., is the leading spirit of the United Rubber Products Co., Limited.

CALLENDER'S CABLE CONSTRUCTION CO., LIMITED.

Callender's Cable Construction Co., Limited, showed an increased profit of £161,524 in 1919 and has paid 15 per cent against 12½ per cent in 1918. As the works at Eritt, London, and Leigh, Lancashire, are now relieved of special government work the additional plant and buildings which were erected during the war period are now available for the largely increased ordinary business. In order to finance this a new public issue of £400,000 Preference shares and £100,000 Ordinary shares has been made, the former at par and the latter at £1.2*s*. per share. It is stated that the sales for 1920 are double those for the same period of 1919.

CARRIAGE OF DANGEROUS GOODS.

A memorandum has recently been issued by the Board of Trade with reference to the carriage of dangerous goods on board ship and there are several references not without interest to the rubber trade. Not for the reason that the rubber manufacturer ships his own chemicals or is responsible for the safe carriage of goods which come from overseas, but rather because the remarks in the text are of general import. Thus with regard to carbon bisulphide it is stated that the vapor has a tendency to travel and if it finds its way to any surface sufficiently warm to ignite it the flame will flash back and ignite the liquid. This has occurred at twenty feet from the warm surface. The mere striking together of two pieces of iron within the inflammable atmosphere may cause ignition.

Aniline oil is stated to give off vapors which are poisonous if inhaled for some time. "Some time" strikes one as rather too indefinite. It is interesting to note that nothing is said regarding reclaimed rubber although some of the shipping companies decline to carry it, without much reason, in my opinion. The association with oil has raised the bar, as so many oiled materials are liable to spontaneous combustion. In the memorandum it is recommended that cases containing oiled goods intended for exportation as merchandise should be perforated or otherwise ventilated. When oiled materials are used for packing, care should be taken to see that they have been properly dried and that the various folds do not overlap in such a way as to bring several thicknesses of the material together. If oiled clothing has been seasoned for at least a month after manufacture and is packed in hermetically sealed metal lined cases there should be no risk of spontaneous combustion. With regard to this it would be interesting to know if any cases of fire have occurred in the case of oil clothing in transit since the large expansion of the business in recent years.

It is stated that spontaneous combustion in the case of lampblack is extremely rare, but as there is a possibility of its taking place it should be kept protected from the wet. With regard to this somewhat disputatious matter, all I can say here is that spontaneous combustion of lampblack was not so extremely rare in rubber works in the past, whatever may be the case to-day. But a great deal depends upon the exact nature of the lampblack or what is sold as lampblack, some blacks being much more liable to fire than others. The Board of Trade is advised that india rubber solution comes under the heading of dangerous goods, and that it must not be treated as general cargo and covered with other goods. It may be shipped under deck provided it is made up in small collapsible lead tubes or in one-quarter and one-pound tins packed in sawdust in tin lined cases. The same precautions are to be taken with solutions of gutta percha in tetrachloride of carbon, because, although it is non-inflammable, it is an anesthetic like chloroform.

DUMPING.

What exactly is dumping? Definitions seem to vary according as to how the imported goods affect the individual pocket. On June 9 in the House of Commons the Under Secretary for the Board of Trade was questioned as to whether the dumping of French and American tires had caused the dismissal of 800 workmen at the Wood-Milne works, Leyland, and was further the cause of other manufacturers slowing down their output. A further question was whether the Government's anti-dumping legislation would be quickly introduced. On the latter point the answer was to the effect that no statement was possible at present. With regard to the general question, the Under Secretary said tnat he was not satisfied that the home industry was seriously affected nor had he any evidence that foreign tires were being dumped in this country. Obviously he does not treat the term sold as being synomymous with dumped, as his questioner seemed inclined to do. He also added that the export of rubber tires in the first five months of this year had exceeded the imports by about £600,000, while in 1913 the imports exceeded the exports by about £470,000. As the American invasion had not at that time gathered strength the total must have been mainly made up of French, German and Russian tires.

THE KING'S BIRTHDAY HONORS.

Among the recipients are one or two names known in the rubber trade. The knighthood bestowed on H. A. Wickham, as father of the rubber planting industry, is an honor which has been generally acclaimed. There is no need here to recapitulate the deeds in the earlier life of the recipient, as they are to be found in the rubber literature.

Philip S. Stott, who received a baronetcy, is a Lancashire man well known as a cotton mill architect. His connection with the rubber trade is not very close, but as a director of the large Dunlop Cotton Mills he may be said to be in touch with the industry.

W. H. Veno, who received a knighthood, is in somewhat the same category; although in business he is a manufacturing druggist, he has for some time had large financial interests in rubber manufacturing, being at the present time a director of the Monarch Rubber Co., Limited, of Manchester.

Mention may be made also of John Henderson Stewart, who receives a baronetcy. Although best known in other spheres of industry, he is chairman of the Sorbo Rubber Sponge Products, Limited, of London, a company which is now building a large new works at Woking, Surrey.

POTTERS ASBESTOS CO., LIMITED.

This concern, which has works at Rochdale and the neighboring towns of Littleborough, has been taken over by Bells United Asbestos Co., Limited, and some of the new machinery has been transferred to the works of the latter company at Harefield, Middlesex. The share capital of Potters is £68,600, and the chairman is Frank Turner, who is not now connected with the well-known asbestos concern of that name. The directorate of Bell's United Asbestos Co. is to be increased and Frank Turner will have a seat on the board. The Bell's United Asbestos Co. for last year paid a dividend of 12½ per cent, added to which was a bonus of 5 per cent.

LOUIS MINTON.

The business arrangement which has been in existence for many years between Louis Minton and Messrs. Typke and King, rubber chemical manufacturers, of London, has recently been terminated. Mr. Minton, however, will continue at Trevelyan Buildings, Manchester, to cater for the rubber manufacturers' requirements in raw and reclaimed rubber, pigments, substitutes, accelerators, sulphur and other chemicals. Having been, prior to 1898, a rubber manufacturer, he can claim with reason to be in a special way qualified to supply goods suitable for the different branches of the trade.

ZAMA, LIMITED.

This company, which carries on a proofing business at Pendleton, Manchester, has recently been sold to Thos. Mellor & Sons, of Portland street, Manchester. During the war the spreading machines were fully engaged on special work, but latterly all classes of proofing for the trade have been undertaken. J. E. Baber, who has had considerable experience in the proofing industry, will act as manager under the new regime.

CHESS-BRAND, LIMITED.

This firm has gone into voluntary liquidation and the business of rubber sole and heel manufacturers will be continued at the works, which are situated at Middleton, Lancashire, by a new company called Chess & Stead, Limited, with George Metcalfe as managing director. The new company will also operate the Chess-Brand works at Strand, Gloucestershire, these having now passed into their possession with the Middleton works. These latter, it may be recalled, were started by Mr. Roberts when he was head of the Wood-Milne Co., Limited.

J. HALSTEAD & CO.

This firm at Crow Oak Works, Whitefield, Lancashire, is among the more recently started proofing works doing proofing for the trade. G. C. Pratt, who has had many years' experience on the rubber side, is proofing manager.

NOT DUMPING TIRES ON BRITISH AUTO MARKET.

According to the American Chamber of Commerce in London, it is understood that large quantities of American and French tires were being dumped on the British markets to the disadvantage of British manufacturers. Information given by the secretary to the Board of Trade, in reply to inquiries made by Members of Parliament, show that during the first five months of this year the export of tires exceeded in value the imports by over £600,000 sterling, and in the corresponding period of 1914 imports exceeded exports in value by £470,000 sterling.

The inquiries, says the American chamber, emanated from the report that a well known firm of tire manufacturers found it necessary to dismiss a large number of their workmen, and this was attributed to the dumping of foreign tires.

RUBBER GROWERS ASSIST RUBBER EXHIBITION.

The Fifth International Exhibition of Rubber, Other Tropical Products and Allied Industries and the International Rubber Congress to be held in connection with it at the Royal Agricultural Hall, London, in June, 1921, will receive the hearty support of the Rubber Growers' Association, as in 1914. Special committees are being appointed to deal with competitions, the plantation rubber section of the international congress and other matters. A rubber tennis court will again be a feature of the associations' exhibits. Sir Ernest Birch, K.C.M.G., is chairman both of the Rubber Growers' Association's special exhibition committee and of the committees for the exhibition organization. The exhibition offices are at 43 Essex street, Strand, London, W. C. 2.

Brazilian shipping facilities will be improved through the inauguration of monthly services by the Pacific-Argentine-Brazilian Line of San Francisco and the Lloyd Royal Belge Steamship Co. of Belgium. Steamers of the first-named company, after stopping at west coast ports, will call at those in Argentina, Uruguay and Brazil, and return by way of the Panama Canal. Those of the Belgian line will call at Antwerp, Rotterdam, Amsterdam, Hamburg, Brazilian ports, Montevideo, and Buenos Aires.

The Bureau of Education in the Philippine Islands is planning a course of athletic training that will require every public school to invest in athletic equipment. The increasingly popular games of baseball, indoor baseball, volley ball, soccer, golf, handball, and tennis are to be included.

The Rubber Industry in Germany.

By a Special Correspondent.

PUZZLED is the expression that exactly describes the state of mind of our rubber manufacturers at the present time. They are puzzled that prices should decline in a market that has shown a rising tendency; they are puzzled about the fluctuations of the exchange value of the mark, and they are puzzled about the attitude of other markets toward Germany. These three problems have created a nervous tension that expressed itself in a renewed disorganization of the market which first appeared early in June and has steadily increased ever since. Much of the existing apprehension, no doubt, might be allayed if the German manufacturers were in full possession of the facts. But the news service is still very unsatisfactory, and, moreover, the Germans were never known to read foreign news with an unbiased mind. The trouble started with the sudden advance in the value of the mark in New York and other leading trading centers of the world. True, the recovery was not particularly striking and had been long talked of by every German merchant and manufacturer. But it seems that no one really expected it to happen. As all quotations for raw materials in Germany at the present time are based on foreign exchange, the increased price of the mark naturally had a depressing effect on prices. That means the mark which had had a value, say of 2 cents in the past, suddenly jumped to double its purchase value and the prices came down accordingly.

EFFECT OF ADVANCES IN GERMAN EXCHANGE.

The whole occurrence, of course, had nothing to do with the inherent purchasing value of the mark or the quality of the goods, but it naturally tended to unsettle prices generally. Values have been exceedingly high all through the period of reconstruction in Germany and Austria. In Austria no proper price quotation seems to exist at all. However, Vienna has felt the effect of the recovery of the mark through heavy fluctuations in values.

Steps are now being taken in Germany to bring the value of public services such as transportation, postal service, etc., into better relation to the actual value of the mark, and it is to be expected that this will soon lead to some sort of price stabilization. Only quite recently the Imperial Post Office settled the new rates for letters and other mail. Ordinary letters that formerly cost 10 pfennig are now costing 40 pfennig. Postal cards now cost 30 pfennig instead of 5 pfennig. The Post Office, therefore, assumes that the value of the German mark has depreciated approximately to one-fourth or one-fifth of its pre-war value. Naturally such an increase in postal rates has its bearing upon the whole price situation in the country. It affects mail advertising and the transaction of all business.

How upset are price quotations at the present time in Germany and Austria can be seen from the fact that tennis balls have been selling in Vienna for 200 to 300 kronen each, which is between $40 and $60 pre-war exchange. Automobiles were sold a short time ago in Vienna for the phenomenal sum of one million kronen, $200,000 old exchange, but have come down now under the influence of the exchange recovery to half a million kronen. Raw material prices, of course, are all in the air. Rubber is quoted on the basis of American or English prices with the exchange fluctuations as the basis of the transaction, which makes the price change practically every day. Hemp yarn which sold for 32 cents a kilogram former exchange, is now not to be had at much below 36 marks or $9 old exchange. Cotton yarns for weaving tire fabrics and similar materials have gone up to 150 marks a kilogram, $36.00 old exchange, against a matter of 35 cents in the past. Still more pronounced are the price increases in such materials as asbestos; the best crude is now being sold at 150,000 marks a ton, compared to 1,300 marks before the war. No wonder that great efforts were made to introduce substitutes. Substitute yarns made from old rags have been offered and new fiber plants have been tried out to replace hemp and cotton. For a while it was the fashion to think these substitute materials were superior to the real article. Since the return of peace, however, the mask has been dropped, and manufacturers admit that the substitutes have been a flat failure in most instances and that the industry will require standard materials if it is to continue manufacturing on a profitable basis. Today, wherever the German substitute-made article meets rubber goods made abroad from standard materials, the German goods lose out, even in the domestic market. This is a very serious matter for the German rubber industry and there is no doubt that steps will have to be taken to make available sufficient quantities of standard raw materials if the industry shall ever recover again. This also has considerable bearing upon the future of German rubber exports.

FOREIGN RUBBER TRADE DESTROYED.

Right after the signing of the armistice German rubber manufacturers were very hopeful for the resumption of their former export trade. The sentiment of France was then not fully realized and the Germans believed that they would be allowed to enter the community of nations again on equal terms. These expectations have now been destroyed, and nearly two years have passed in which the rubber industry has been retarded and its difficulties intensified. It is now recognized that the foreign trading organization of the German rubber industry is completely destroyed. The well equipped agencies in enemy countries have been sold, as for instance the fine London business of the Continental company, and it has not been possible to keep up agencies in neutral countries owing to the high cost entailed. Shortly after the signing of the armistice German manufacturers made attempts to get in touch with some of their customers. They found, however, more competition than had been expected and that the American rubber industry especially had gained ascendency in foreign business. The Germans, therefore, will have to rebuild their rubber business entirely, and the question has been discussed whether under such circumstances it would be better to give up exporting entirely. This, however, is a difficult accomplishment.

RUBBER INDUSTRY HANDICAPPED.

The German rubber industry has invested heavily in equipment and buildings that could not be turned easily to other purposes. Also, Germany has nearly 80,000 men trained in rubber manufacturing for whom no new employment could be found. The German system of training industrial labor, although very efficient in the production of high-class operatives, has the disadvantage that it makes specialists who cannot change over easily from one industry to another. To reduce rubber production would therefore spell unemployment for a large number of excellently trained men, which is a thing to be avoided at any cost. This problem is still more complicated by the fact that sales in many of the best paying branches of the rubber industry are declining heavily. Germany has to pay off an enormous debt and the Germans will be poor for many years to come. Under such circumstances it has become a necessity to cut down all expenditures for luxuries. The time has come when the possession of an automobile is not quite the thing and statistics seem to indicate a rapid decline in the sale of automobiles. The automobile business in consequence is expected to decline heavily during the coming years. It is not quite clear whether the demand for bicycle tires will recompense sufficiently the industry for its loss in sales of the more costly article. Another difficulty

to be faced in this respect is the rising cost of production. The low value of the mark not only makes the purchase of raw materials difficult, but measured by international standards Germany today buys much more expensively than any other country of the world. It follows that each article carries a severe initial handicap in manufacturing cost that cannot be overcome easily. Under such circumstances it is rather astonishing to see that the German Government seems to be inclined to cut down export activities still further by creating a special taxation of export values for the purpose of raising the German revenues. This matter is now under consideration and rubber manufacturers, especially, are up in arms against such a measure. Whether they will succeed is doubtful in view of the very serious financial condition of the country which calls for a practically complete divestment of all surplus property. Incidentally, there is hardly any money available for advertising purposes, and foreign advertising that had been continued by several firms during the first years of the war as a matter of good policy has now ceased entirely.

PRICES OF RUBBER GOODS PROHIBITIVE.

These export troubles are only a reflection of the more acute domestic difficulties. Here are a few instances that may illustrate the situation. All through the war and following, canning and preserving have been encouraged. There is little wasted just now in Germany. But the rubber rings used in preserving have gone up excessively in price. Formerly such a ring could be had for two cents or so. Today, 50 cents and even 75 cents on the basis of the old exchange must be paid. Also the rings are not of the former quality. The German jar-ring industry has been very active in the past and a great number of specialties were introduced to make the opening of the cans easier. Most of these specialties made opening dependent upon the tearing of the ring. In addition, they required more rubber for their manufacture. With the present prices, housewives do not care to buy such rings and the simpler forms have been introduced generally. As the rubber rings were so expensive, substitutes have been offered. These, however, have not turned out very satisfactorily as was the case with most substitutes. The present situation is that the German market is undersupplied with rings and that dealers are trying frantically to increase their stocks. Rubber jar rings today are an article bought and sold in a speculative manner as shares on the New York Stock Exchange.

PROFITEERING RAMPANT.

The same applies to belting. But the belting dealers have had a severe shock recently owing to the heavy break in prices explained in the beginning of this letter. It is suspected that a large quantity of belting has been bought by dealers for future sale at large profits; profiteering, in fact, is just as rampant in Germany today as it seems to be in other parts of the world. Now, prices have gone down and the speculators wonder what to do with their stocks. It is expected that rubber belting will find more and more appreciation in Germany as soon as a better quality can be made than is the case just now. Rubber manufacturers complain that the rubber belt has not had a fair chance during the past and that it has not been used wisely during the war. Together with the drop in the cost of belting in Germany has come a general depression of all trading, caused principally by an extensive disorganization of values. Orders are coming in very irregularly. The rubber industry has probably been hit least by this development as the dependency of the industry on foreign supplies acts as a stabilizing factor upon prices. But there is no doubt that the rubber goods dealers are becoming more and more careful and while trying to keep up prices they admit that orders are not obtained at the present quotations. The German manufacturers who are keen to continue present prices are making special efforts to keep up the spirit of the market. They point out that prices in other countries are high and that the output of rubber goods outside of Germany is also considerably below the actual demand. There seems to be some truth in this statement, as there is a noticeable falling off of foreign rubber supplies in the domestic market. For a while the "Hole in the West" and the new hole in the East offered by Danzig were giving to enterprising dealers an excellent opportunity of introducing expensive foreign rubber goods. It is astonishing that notwithstanding the financial condition of the country and the high prices that had to be charged for such goods, there was still a demand for English tennis balls. Recently no English tennis balls were to be had in Berlin at any price and our German sportsmen are losing their mental balance because the German ball is inferior in quality to the English and does not have the correct weight. This applies to many other sporting goods made from india rubber, of which large quantities had been imported immediately after the war.

INDUSTRIAL FAIRS NOT BENEFICIAL.

The spring fair in Frankfort, which has been held for the purpose of giving the German manufacturer a chance to keep up his connection with the occupied territory, has not been as successful as the autumn fair of last year. It suffered under the French occupation which then was in progress and still more under the generally disorganized transportation and traveling conditions that followed the famous Kapp revolution. The sales in the rubber section, therefore, were not very good. This section, in fact, was rather small, considering the general importance of West Germany as a rubber producer, and only surgical rubber goods were comparatively well represented. There have sprung up in Germany quite a number of these fairs destined either to aid in the sale of German goods or to help the import of raw materials. It is, however, very doubtful whether these enterprises will really benefit the importer of raw materials, as the German manufacturer is not inclined to buy in this manner, but prefers to deal with importers known to him. If American exporters of reclaimed rubber and other materials wish to get in touch with Germany, they should establish proper trading agencies to handle not only the German market but also that of Poland, Bohemia, and the former Austria, all of which seem to hold a good promise for the future.

RUBBER SITUATION IMPROVING.

The present depression in the German market will not be of very long duration. It will come to an end with the expected stabilization of the exchanges. This is indicated to some extent by the report of the Demobilization Commission, which stated that the rubber industry was comparatively busy during the first quarter of the year and had sufficient orders to guarantee a favorable occupation rate. In the technical and surgical section of the industry overtime had to be resorted to. The general situation of the industry is very much improved as compared with the same period during the preceding year, notwithstanding all present troubles.

MANUFACTURE OF SYNTHETIC RUBBER IN GERMANY DISCONTINUED.

Authentic news comes from Germany about the discontinuation of the manufacture of synthetic rubber by the Farben fabriken vorm. Friedrich Bayer & Co. This company had built during the war a large plant for the manufacture of synthetic rubber in Leverkusen and it had become possible to produce considerable quantities of substitute rubber. Part of this rubber has been used during the war by the German army for tires and for a while German scientists and economists were very hopeful that the manufacture of synthetic rubber could be firmly established in Germany. During the recent general meeting of the shareholders of the company it was announced that the company has

closed its Leverkusen rubber works and does not intend to continue the manufacture of synthetic rubber as part of its activities. The rapid rise in the cost of acetone and aluminum has increased the cost of production as such a rate that today the price of the synthetic rubber exceeds that of the natural product. The company discontinued manufacturing immediately after the cessation of hostilities and the existing stocks of the material were sold out.

NOTES OF THE TRADE.

The depression in the German rubber goods market continues. All branches of the industry are finding their market considerably curtailed and evidence of overstocking in the retail market begins to appear everywhere. The manufacturers of surgical rubber goods who had been fairly busy during May and June now begin to feel the slump, and complaints are heard about cancellation of orders. The cause of the present difficulty in the surgical rubber industry differs somewhat from that in most other branches of the rubber industry. The demand for surgical rubber goods has naturally been very active immediately after the war and the dealers in consequence have been in the habit of carrying much larger stocks than would be necessary in normal times. They find now that they cannot dispose of the expected quantities and naturally try to reduce their commitments. Surgical rubber goods have been sold at rather excessive prices by the dealers and there is no denying that a certain amount of profiteering has taken place in this line. The trade associations have realized this fact and while they have urged high prices during the former shortage they are now recommending reductions amounting to 33 and even 50 per cent.

Another branch of the industry is feeling the situation very acutely—namely, the makers of sporting goods and toys. The number of rubber toy manufacturers declined during the war because no rubber was obtainable. Sporting goods still have been made but in reduced quantities. When the war ended the industry tried to pick up its old connections again and the results of the first trading fairs seemed to be most promising. Large orders were received from abroad and the aspect was pleasing enough. The last weeks, however, have proved a decided disappointment. The German rubber toy industry has gained its influence by the high quantity of its production as well as by the cheap price for which the goods have been sold. It appears now that the output of more recent times has not been very satisfactory and that, in consequence, orders have declined. Also the price of the toys has reached a level which makes the German industry less competitive than in the past.

The Bureau for the Control of Foreign Trade in Rubber Materials and Rubber Goods (the *Aussenhandels Nebenstelle Kautschuk*) has now commenced operation. It is in charge of Walter Lindemann, the manager of the central union of German rubber goods manufacturers. The work of the Bureau will be guided by the following principles: the import of raw rubber, gutta percha, balata, and scrap rubber, is free from all restrictions and, therefore, is not subject to the control of the Bureau. The import of manufactures of rubber and goods for further use in manufacturing is in principle prohibited. Exceptions will be made in the case of such goods as are urgently required for the continuation of German economic life and cannot be manufactured in Germany or cannot be had in a reasonable time. The importer will have to prove the urgency of his request. The import of reclaimed rubber is limited to 5,000 tons in all. The import of factice is not permitted unless proof is provided that the required quantities or qualities cannot be had in Germany.

The export of raw rubber, gutta percha, balata, and scrap, is permitted. The export of manufactures of rubber is permitted as long as the price is not below the domestic minimum prices. The export of reclaimed rubber is permitted. The export of factice is permitted with the exception of such qualities as are manufactured by the use of rape-seed oil. Exception can be made under certain circumstances. The exporter may bill his export goods either in German or foreign money units.

The *Liga Gummiwerke Heinrich Peter & Co., G. m. b. H.,* in Frankfort-on-the-Main, has increased its capital to 3,000,000 marks.

The *Continental Caoutchouc und Guttapercha Compagnie* in Hanover has increased its capital from 15,000,000 to 34,500,000 marks.

The *Ungarische Gummiwaren Fabrik A. G.* in Budapest, Hungary, has increased its capital from 6,000,000 kronen to 10,000,000 kronen.

FOREIGN NOTES.

FRENCH EQUATORIAL AFRICA exported 2,221,133 kilos of rubber in 1919, as compared with 1,980,723 kilos in 1918 and 1,756,436 kilos in 1913, the year before the war.

France's exports of rubber manufactures in 1919 amounted to 226,000,000 francs in value. The figures for previous years are:

1918	*francs* 96,000,000	1915	*francs* 80,000,000
1917	*francs* 117,000,000	1914	*francs* 85,000,000
1916	*francs* 108,000,000	1913	*francs* 100,000,000

To the Alsace-Lorraine production much of the increment is due.

Denmark imported in 1919 rubber of the value of 115,000,000 kroner.

Holland in the first quarter of 1920 did a less satisfactory business in rubber tires than in the year before, because exportation was made more difficult and the importation of foreign tires was made easier. On the other hand, no complaint is to be found as regards the manufactures of technical and sanitary rubber goods other than dock and transportation strikes. Imports of tires for the quarter amounted to 3,145,551 gulden and exports, to 147.411 gulden. Imports of raw rubber amounted to 2,126,672 kilos, of which 2,022,578 came from the Dutch East Indies and 19,940 kilos of balata from Curaçao. Exports of rubber amounted to 1,655,043 kilos, of which 1,085,983 kilos went to the United States, and besides 20,393 kilos of balata were exported.

A company has been registered in Bombay, India, as "The Pioneer Rubber & Industrial Co., Ltd.," with a capital of £500,000 English, (50 lakhs of rupees), to reclaim waste rubber and manufacture rubber goods, such as tires, tubes, surgical goods, heels, waterproof clothing, and ebonite. Sir Fazulbhoy Currimbhoy is chairman of the board of directors, and Manu Subedar & Co. are the managing agents.

CORD TIRES TO BE MADE IN CUBA.


RAUL GODOY.

The Cuban Tire & Rubber Co. (*Compañia Cubana de Zunchos y Goma*), Havana, Cuba, said to be the pioneer tire factory in Latin-America, was incorporated in August, 1916, with an authorized capital of $1,750,000 for the manufacture of tires, tubes, and other rubber goods.

Under the efficient guidance of Raul Godoy, general manager, the company has steadily progressed and is now making 150 fabric tires, 500 tubes, some heels, and mechanical goods for the sugar centrals. Appreciating the necessity of adding cord tires to the company's products, Mr. Godoy recently spent six months in the United States acquiring the necessary technical information and mechanical equipment for making high-grade cord tires.

News from British Guiana and Trinidad.

Special Correspondence.

Frank Daphne, the solicitor to the Essequibo Rubber & Tobacco Estates Defence Committee, has issued the final report and audited accounts to the subscribers to the fund. There was complicated and protracted litigation and the winding up of the company was not completed till 1919, but in the end the subscribers to the fund, about 300 in number, have received a return (including an interim distribution in 1915) equivalent to 7*s.* in the £ on the amount they paid for shares. They are to be congratulated, for unfortunately proceedings of this kind rarely terminate so satisfactorily. It should be added that only shareholders who subscribed to the fund benefited from the efforts of the committee.

The company was registered in Georgetown, British Guiana, on April 6, 1910, with a nominal capital of £100,000 in five-shilling shares, to acquire the benefit of four licenses granting the right to collect rubber, balata and like substances over an area of 200 square miles of the Crown Lands in British Guiana and to develop the land as a rubber, tobacco, and general produce estate. The licenses were granted to J. M. Ho-A-Hing on June 5, 1906, for a term of 10 years at an annual total rental of $80, and a royalty of two cents on every pound of rubber or balata collected. The nominal promoter of the company was the Industrial Selections, Limited, who received £4,500 for preliminary expenses but the actual promoter was Joseph Chansay, the beneficial owner of practically the whole of the issued capital of Industrial Selections, Limited. The first directors of the company were Sir Henry E. Dering, Bart., J. P., Sir Henry Seton-Karr, C. M. G., Captain W. J. M. Hill and William O'Malley, M. P.

Captain Hill resigned on June 30, 1911, and P. Halcrow was appointed in his stead on February 7, 1912. On February 23, 1912, Sir Henry Dering tendered his resignation which was accepted on March 4.

The 400,000 shares comprising the nominal capital of the company were offered for subscription at par by a prospectus dated April 13, 1910, and published by the "Financial Outlook," which unhesitatingly recommended the company.

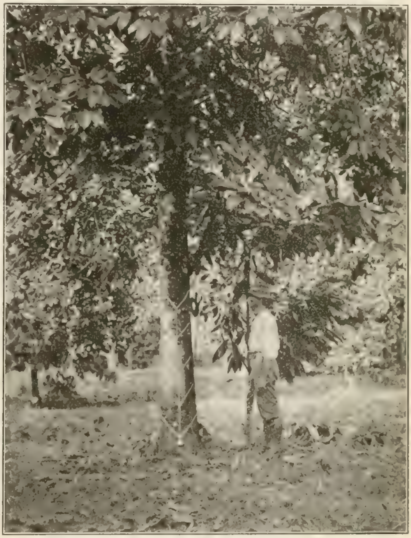
The company's affairs were ordered to be wound up on June 25, 1912, on the petition of six shareholders (1,480 shares) supported by 28 other shareholders (5,185 shares), presented on May 4. The statement as prepared by the directors disclosed a deficit of £68,992.4*s.* 5*d.*

The property of the company was sold at auction in August, 1912, when a private offer of $16,800 by W. L. Seymour, the representative of an English syndicate, was accepted for the Liberty Island Estates held under a 99 years' lease from the Government.

A prominent British Guiana journal, dealing with the above, recently said:

The announcement that the subscribers to the Essequibo Rubber & Tobacco Estates Defence Fund are to receive a dividend of 7*s.* in a pound recalls the rubber boom of almost a decade ago, when British Guiana was to share in the fabulous wealth then being won from this industry. Enthusiasm ran so high that the Department of Science and Agriculture went to the expense of producing a brochure informing the world that there were some nine million acres available for rubber cultivation in the colony and that the rubber grown here was equal to the best product of the East. Several companies were formed and so confident was everybody in the colony that we had a rubber industry that we even had the temerity to exhibit at the Rubber Exhibition in London. That the boasts of the Department of Science and Agriculture as to the quality of British Guiana rubber were not idle was borne out by the fact that the colony carried off two cups. Unfortunately many of the companies that were formed were sponsored by busy speculators, who were far more anxious to grow rich quickly than they were to make money honestly by the development of an industry that had the best of prospects —and still has.

The boom soon collapsed and the rubber industry of British Guiana became such a minor affair as to be forgotten for all practical purposes. It had not altogether died, however, for in 1918 the exports reached the total of 23,854 pounds. This was not a great contribution to the world's supply, it is true, but still sufficient to justify the assertion that the industry is alive. In the long run it will probably be found a good thing that the foundations of the industry were not laid in the treacherous quicksands of a boom. When it does take its proper place in the industrial economy of the colony it will not at any rate owe its very existence to an abnormally inflated price of 12*s.* 6*d.* a pound, and the time may come when this colony will be able to sell its rubber in the markets of the world at the world's price. At present, according to the representative of one of the largest rubber cultivators in the colony, owing to labor shortage and leaf disease, it is not possible to tap the colony's rubber trees at a profit. The price in London to-day is ruling at only 2*s.* 3*d,* a pound, and it is held that with the high price of labor it is impossible to compete with the East.



Multiple "V" Tapping, Richmond Estate, Tobago.

It is interesting to glance for a moment at the progress made in Trinidad, which was also to become a "rubber country" a few years ago. Trinidad has not become a rubber country, but its industry has developed better than ours and there seems to be a little more optimism about it than there is here. The exports in 1919 amounted to 41,000 pounds and the industry evidently had sufficient life in it to be worthy of discussion by the excellent Agricultural Society that looks after these things in

Trinidad. (Incidentally, we have nothing quite like the Trinidad Agricultural Society in the colony.) This discussion elicited the fact that the Department of Agriculture in Trinidad has not abandoned its experiments with rubber, as we believe is the case in this colony. The Director of Agriculture gave some particulars of tapping experiments that are of great moment because they go far to meet the principal difficulty in this colony, namely the labor shortage. *Hevea* trees are supposed to require tapping every other day. Mr. Freeman resolved to try a series of experiments, tapping every two days, and every six. The results were more than gratifying. The trees tapped three times a week yielded 22½ pounds a tree in 4½ years, those twice a week 19.3 pounds and those once a week 9.2 pounds. Thus, by tapping three times in two weeks instead of six times they get a yield only of 3 pounds less per tree in 4½ years. The importance of this experiment upon the labor difficulty is obvious. Trinidad is fortunate in having a rubber enthusiast. E. A. Robinson grows rubber, not to test theories as the Department of Agriculture does, or because it amuses him, but as a commercial proposition. In 1919 Mr. Robinson organized labor to tap 1,600 trees and produced 28,000 pounds and he got roughly 400 pounds to the acre, whereas in the East the average is as follows: southern Java 218 pounds; Straits Settlements 247 pounds; Ceylon 312 pounds; Java 322 pounds; Sumatra 326 pounds; and in one district of the Federated Malay States 382 pounds. In the East, rubber is clean-weeded, forked and manured; in Trinidad Mr. Robinson does nothing but drain his land. For labor he uses boys and girls, also adults of both sexes, and pays them 40 and 50 cents a day. As they can do a day's task of 200 trees by 11 o'clock they can make much more money with extra work. Mr. Robinson is an exception. It is not believed that rubber can be grown profitably in Trinidad any more than it is believed that it can be grown profitably in this colony. Nevertheless he is planning to produce 70,000 pounds of rubber this year. We should not be surprised if the foundation of another big industry is being laid in Trinidad.

MALAYAN CRUDE RUBBER INDUSTRY IN 1919.

By Consul General, Edwin N. Gunsaulus,

Singapore, Straits Settlements.

THE ANNUAL REPORT of the Planters' Association of Malaya for the year 1919, presented at a meeting of the Association held a few days ago, contains much interesting information relative to the rubber industry during the period under review. Some of the more salient points of this report are given below:

The year 1919 commenced with heavy stocks in this country, and in many directions fears were expressed as to the ability of the manufacturers to absorb them. Crop restrictions were relaxed during the first part of the year and the shortage in shipping did much to augment this. A great deal of speculation resulted on the signing of the armistice and temporarily affected prices in Singapore, but the removal of the American import restrictions brought a more steadying influence to bear on the position, and in the ensuing months of the year matters adjusted themselves more nearly to a resumption of the natural law of supply and demand.

The output of rubber in Malaya during 1919 and the previous three years was as follows:

Provinces.	1916.	1917.	1918.	1919.	Increase in 1919 over 1918.
	Tons.	Tons.	Tons.	Tons.	Per cent.
Selangor	26,163	32,614	31,417	39,570	26
Perak	23,421	30,129	30,219	41,580	37
Johore	14,004	19,089	22,816	27,890	22
Malacca	12,388	16,075	16,693	22,414	34
Negri Sembilan	12,179	15,526	15,154	22,846	50
Penang, Province Wellesley and Dindings	4,935	5,596	5,762	8,089	40
Kedah	3,314	5,266	5,276	6,472	22
Singapore	628	2,471	2,600	3,200	23
Pahang	1,001	1,562	1,494	2,457	64
Kelantan	1,010	1,490	1,745	2,077	19
Trengganu	20	105	188	244	29
Total	99,063	129,923	133,364	176,839	32

RUBBER PRODUCTION.

During the past 11 years the total production has been as follows:

Years	Tons
1919	176,839
1918	133,364
1917	129,923
1916	99,063
1915	70,214
1914	47,006
1913	33,641
1912	20,327
1911	10,782
1910	6,504
1909	3,340

FOREIGN COMMERCE IN RUBBER—WORLD PRODUCTION.

The export figures for 1919 are interesting when compared with the production for the year, as they show some 22,918 tons more were shipped than the total of the Malayan crop, while at the end of 1918 only 6,312 tons are given as having remained unshipped.

The Board of Trade returns for 1919 give the total imports of rubber to the United Kingdom at 101,891 tons, of which amount 58,132 tons were supplied by the Federated Malay States and Straits Settlements. On December 31 stocks of plantation grades at London and Liverpool amounted to 23,236 tons. In ten months ending October, 1919, the United States took 124,339 tons of rubber from the British Indies, an increase of 30,904 tons over the amount supplied during the corresponding period in 1918.

According to Rickinson's "World Rubber Position," the world's production of plantation rubber in 1919 was estimated at 285,225 tons, Brazilian and wild rubbers at 41,635 tons, and the amount afloat on December 31, 1919, at 47,340 tons, making a total of 374,200 tons. Of this amount 55,000 tons were produced in 1918.

SHARE OF CONSUMING COUNTRIES—TREMENDOUS INCREASE IN DEMAND FOR RUBBER.

The consuming countries in their order of importance were:

	Per Cent.
America	65
United Kingdom	13
France	6.5
Italy, etc.	4
Canada	3
Japan and Australia	3.5
Russia	0.5
Scandinavia	2
Belgium	1.5
Germany, etc.	1

It is pointed out that during the past 10 years the consumption of rubber in the United States has shown an average increase of 27¾ per cent per annum. Should the spread of motor traction result in an annual increase in the world's consumption equal to 25 per cent, it would be necessary by 1924 to harvest from the plantations a crop of no less than 766 pounds per acre in order to meet the demand. It, therefore, follows as a safe conclusion that we are approaching a time when the supplies of raw material will not be large enough to meet the demand.

Most of the rubber produced is for the manufacture of tires, and if this demand is maintained during the next few years there will not be enough rubber available, as only the present planted area of 2,910,750 acres will be tappable during the next five years.

The *Société Anonyme des Plantations de Telok-Dalam* of Antwerp, Belgium, in its tenth annual report for 1919, announces profits of 1,691,460.74 francs. The company owns 4,405 acres of land in Asahan, Sumatra, of which 2,405 acres are under cultivation. This yielded, in 1919, 909,540 pounds of rubber instead of the anticipated 720,310 pounds; the average price obtained for it was 6.35 francs a kilo, while in 1918 the price obtained was 3.87 francs. The number of trees per acre when the company started was 105; this has been cut down to 74 and this year 5 trees an acre more will be removed. In 1918 the yield was 5.178 pounds per tree and 384.8 pounds per acre; last year it was 5.83 pounds per tree and 393.05 pounds per acre. The president of the company is E. Bunge and among the directors are A. and E. Grisar.

THE RUBBER INDUSTRY IN THE NETHERLAND EAST INDIES.

By Our Regular Correspondent.

In considering the prospects for Netherland East Indian agricultural products in 1920, a local authority declares that the impoverished condition of Europe will not affect trade to such an extent as might be expected, because the United States and several Asiatic countries have proved to be large consumers of colonial products.

He concludes by pointing out that the labor unrest all over the world has also invaded these parts and should not be lightly considered.

LABOR TROUBLES AND THE CURE.

The labor problem is more complex here than it is in America. Here we have not only the European employes on the estates to consider but also coolie labor. That employers and the Government, both, are alive to the need of some action is abundantly evident. The local government has just published a draft of regulations intended to benefit the European assistants of the east coast of Sumatra, and it is supposed that similar regulations will be drawn up for Java and Madura.

The regulations lay down terms concerning the working contract of an employe, stipulating that he shall have leave of absence of at least one month each year for the first six years, and foreign leave of eight months if he has been with an employer for over six years. One clause provides that any condition made by the employer to prevent directly or indirectly the marriage of an employe shall be void.

One of the foremost companies active in improving the condition of its employes is the Holland-American Plantation Co., a subsidiary of the United States Rubber Plantations, Inc., that has recently fixed salaries for field assistants as follows: beginner's salary, fl. 300 (one florin equals 40 cents) per month; after the first year this is increased by fl. 50 a month each year, until the employe has been with the concern 14 years, when he will receive a salary of fl. 800 per month. On January 1, 1920, a new ruling went into effect which provides for pensions. The maximum pension after 20 years' service and at the age of 45 years, or in case of illness making the employe an invalid, is fl. 2,400 per annum, minus 2 per cent of the bonus earned since January 1, 1918. At death the widow receives 60 per cent of the maximum pension, plus 12½ per cent for each child; this pension is also subject to subtraction of 2 per cent of the bonus earned since January 1, 1918.

Other rubber planting companies that have provided pensions for their employes are the Deli-Batavia Rubber Co.,—fl. 1,000 per annum after 18 years' service; the Amsterdam Rubber Cultivating Co. and the Netherlands Rubber Co.—each fl. 1,200 after 18 years' service; Tjinta Radja—a lump sum of fl. 10,000 after 15 years; *Société Financière*—a lump sum of fl. 12,000 after 15 years' service.

As for the coolies, efforts are being made to abolish the recruiting system and contract labor as it now exists and to substitute so-called free labor. It is proposed to bring this about gradually, each year reducing the amount of contract labor and correspondingly increasing the amount of free labor, until all labor will be free.

TAXES.

A good deal of excitement has been caused here in export circles where "time business" is the custom, by the proposed export taxes with a sliding scale. Government officials had proposed a means of protecting time business, which would otherwise receive unfair treatment under a sliding tax scale. It appears, however, that the remedy is worse than the disease, for the proposed protection—an export permit subject to innumerable conditions—is so bound up in red tape that instead of being protected, time business would be seriously hampered.

Therefore, at a recent gathering at Djacja, where delegates from the chief commercial associations of the island convened to discuss the matter, it was decided to cable to the Minister of Colonies in Holland protesting against the proposed measure, and suggesting a stamp tax instead of the much debated duty.

The following table shows how the tax would be regulated on rubber:

If the market price per half-kilo of rubber is:

fl. 0.75 or less	Nihil.
fl. 0.76 to fl. 1.50	2½% of value.
fl. 1.51 to fl. 2.25	3% of value.
fl. 2.26 and over	4% of value.

In addition to this tax, the rubber shipper will have another item to deal with in making up his cost account, namely, a 15 per cent increase in freight charges, announced by the Netherlands-Indies Railways; this is to go into effect on August 1, 1920.

PRODUCTION AND EXPORTS OF RUBBER.

The International Association for the Rubber Planting Industry in the Netherland East Indies publishes the following table of the production and export of rubber for the entire Netherland East Indies during the period 1914-1918. The quantities are given in tons of 1,000 kilo (2,204 pounds).

	Production.					Exports.				
	1914.	1915.	1916.	1917.	1918.	1914.	1915.	1916.	1917.	1918.
Java ... 1,000 *kilos*	3,812	7,510	13,952	18,933	23,558	3,772	7,466	13,941	18,843	17,311
East Coast Sumatra and Atjeh	6,586	10.135	16,374	22,219	23,901	5,279	9,583	15,404	20,789	19,538
West Coast Sumatra	....	89	134	153	9	....	21	....	151	9
Tapanuli	365	519	198	1.188	1,314	362	515	180	154	584
Benkulen	10	155	156	177	24	....	...	...	177	40
Lampong Districts	51	41	68	....	27	45	40	77	....	38
Palembang	99	141	218	317	328	7	18	102	317	270
Djambi	132	506	1,188	1.818	2,577	125	498	1.169	1,761	2,576
Riouw	299	492	792	754	1,548	119	...	...	730	1,068
Banka	30	13	57	67	4	....	6	37	....	38
West Borneo	147	402	921	1,325	1,525	128	363	728	1,325	1,385
South East Borneo	250	479	872	1.077	870	192	94	753	946	1,132
Totals	11,781	20,482	34,930	48,028	55,685	10,029	18,604	32,391	45,193	43,989

LATEX PRODUCTION AND ANATOMICAL STRUCTURE OF HEVEA.

At a recent meeting of the Rubber Planters' Association, Bobilioff discussed the formation of latex and the connection between the anatomical structure and latex production of *Hevea*. From experiments with isolated pieces of bark, he came to the conclusion that after tapping, a new formation of latex takes place, which he believes may be influenced by the presence of amylum. He further found that on the whole the best latex producers had the greatest number of layers of latex canals. In making experiments on bark, age was a great factor.

Other investigators found that while it was not always true of a group of good producers that the amount of latex produced runs parallel with the number of latex rings, this correspondence was noted when a mixed group of good, bad, and medium producers was tested. It has been pointed out that where a plantation has fared so badly that the usual method of finding good producers does not work, investigation of the bark might become a trustworthy aid in thinning.

NOTES.

During the last quarter of 1919, Djambi exported 2,057,650 kilos of rubber and 109,196 kilos of gutta jelutong. Reports about the condition of the crops were satisfactory, expansion of plantings taking place regularly.

It is reported that the Green Star Steamship Co., of New York, will commence regular service between the Netherland's Indies and New York and San Francisco.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED JUNE 8, 1920.

No. 1,342,461. Cushion wheel. G. M. Peters, Kirkwood, Mo.
1,342,562. Tire. A. J. Meyer, Chicago, Ill.
1,342,597. Artificial palm to be worn on the hand as a foot-treating appliance. H. A. Post, Kansas City, Mo.
1,342,611. Storage battery separator and method of manufacture. T. A. Willard, Cleveland, O.
1,342,622. Split rim for tires. R. S. Bryant, assignor by mesne assignments to The Standard Parts Co.—both of Cleveland, O.
1,342,700. Toy gun operated by rubber band. J. A. Talbot, assignor to E. E. Talbot—both of Walla Walla, Wash.
1,342,731. Display stand for tires. C. W. Yelm, assignor to The Gates Rubber Co.—both of Denver, Col.
1,342,736. Self-filling fountain pen with collapsible ink reservoir. M. Borbeck, assignor to Houston Fountain Pen Co.—both of Sioux City, Iowa.
1,342,994. Bath spray. P. J. Fitzgerald, assignor to The Fitzgerald Manufacturing Co.—both of Torrington, Conn.
1,342,997. Embalming device. C. S. Harrell, Lexington, Miss.
1,343,055. Aeronautic device with inflatable pockets to be worn by individuals. J. Kropacz, assignor of one-third to J. Jakuriecz—both of Calgary, Alberta, Canada.
1,343,101. Tool with handle of insulating material. J. A. Weaver, Baltimore, Md.
1,343,108. Flame-throwing sterilizing apparatus with rubber bulb. I. W. P. Buchanan, Lebanon, Tenn.
1,343,113. Nursing bottle attachment to prevent collapsing of nipple. L. D. Clark, Waterville, Me.
1,343,154. Cushion tire. L. W. Ostmann, St. Charles, Mo.
1,343,155. Resilient tire. F. Perdala, Newark, N. J.
1,343,165. Submarine radio system with highly insulated antennae. P. E. Stogoff, New York City.

ISSUED JUNE 15, 1920.

1,343,233. Resilient tire and filling therefor. J. Stander, Brooklyn, N. Y.
1,343,310. Windshield wiper. V. H. Christen, Toledo, Ohio.
1,343,357. Pneumatic cushion. A. C. Eggers, Brooklyn, N. Y., assignor to The Goodyear's India Rubber Glove Mfg. Co., Naugatuck, Conn.
1,343,368. Material for reinforcing rubber articles and method of making same. R. F. Kingsley, East Cleveland, assignor to The Mechanical Rubber Co., Cleveland—both in Ohio.
1,343,380. Hard rubber battery jar and method of manufacture. H. Weida, Highland Park, N. J., assignor to The India Rubber Co., Erie, Pa.
1,343,383. Sole-cutting die with sheet rubber secured to outer surface to furnish unbroken surface to retain operator's grasp. T. W. Bilello, Long Island City, N. Y., assignor by mesne assignments to United Shoe Machinery Corporation, Paterson, N. J.
1,343,394. Demountable rim for tires. O. L. Ingram, Walla Walla, Wash.
1,343,418. Laminated armor for inner tubes. H. M. Stevens, Indianapolis, Ind.
1,343,521. Fountain pen. A. C. Rader, Alta, Iowa.
1,343,526. Tire support. H. M. Smith, Buffalo, N. Y.
1,343,528. Cushion heel. C. C. Stolzenburg, Elyria, Ohio.
1,343,540. Vehicle tire. J. Allend, Philadelphia, Penn.
1,343,621. Fountain pen cleaner. C. W. Garver, Ashland, Ohio.
1,343,684. Wheel cushion and means for mounting same. A. L. Runyan, Omaha, Nebr.
1,343,685. Resilient tire filler. A. L. Runyan, Omaha, Nebr.
1,343,713. Dental massage and polishing appliance with waterproof lining and elastic contracting means. C. W. Fuller, Yonkers, N. Y.
1,343,736. Hatpin guard connected by elastic band. J. B. Maserang, Belleville, Ill.
1,343,787. Syringe. E. Neil, Nashville, Tenn.
1,343,853. Hose coupling. A. Rubin, New York City.
1,343,860. Spring tire. C. E. Williams, Pittsburgh, Penn.
1,343,861. Spring tire. C. E. Williams, Pittsburgh, Penn.
1,343,890. Bulb for tank valves. A. T. Hopkins, assignor to The Mechanical Rubber Co.—both of Cleveland, Ohio.

ISSUED JUNE 22, 1920.

1,343,910. Tension device for printing-press rolls. C. T. Evans, assignor to The Cutler-Hammer Manufacturing Co.—both of Milwaukee, Wis.
1,343,949. Vacuum cup fastening means for dental suction plates. G. S. Whitaker, Gloversville, N. Y.
1,343,950. Dental suction plate. G. S. Whitaker, Gloversville, N. Y.
1,343,967. Hose coupling. H. R. Gilson, New Rochelle, assignor to New York Belting & Packing Co., New York City—both in New York.
1,344,025. Tire. F. Ditchfield, Montreal, Quebec, Canada.
1,344,028. Gasket for inflation-tube connections. A. A. Ewald, Oakfield, Wis.
1,344,079. Rubber stamp attachment. F. E. Frost, Worcester, Mass.
1,344,145. Carcass fabric for pneumatic tire. J. F. Palmer, Riverside, Ill.
1,344,337. Cushion wheel. P. H. Dorsey, Algiers, La.
1,344,346. Cushion tire. F. A. Krusemark, L. G. Funkhouser and H. G. Carpenter, assignors to K., F. & C. Tire & Rubber Corp.—all of Roanoke, Va.
1,344,349. Open face gas mask. G. A. Mickelson, Vancouver, British Columbia, Canada.
1,344,401. Pneumatic wheel with solid tire and pneumatic tube. E. B. Hudson, Middletown, Ohio.
1,344,443. Attaching means for rubber heels. J. W. Denmead, Akron, Ohio.
1,344,5[illegible]4. Cord fabric and rubber soles for boots or shoes, having ends of cords presented to wearing surface. J. E. Grosjean, Lima, assignor by direct and mesne assignments of one-fourth each to L. F. Montgomery, Fort Recovery, and F. L. Maire, Lima—all in Ohio. (See The India Rubber World, June 1, 1920, page 590.)

ISSUED JUNE 29, 1920.

1,344,662. Demountable rim for tires. B. Tamburello, New York City.
1,344,760. One-piece collapsible nursing bottle. W. E. Goddard, Watertown, Wis.
1,344,773. Resilient tire. W. Seidel, Chicago, Ill.
1,344,854. Tire valve. A. C. Berg, White Bear, Minn.
1,344,856. Garment supporter. G. R. Bonebright, Grand Rapids, Mich.
1,344,935. Ear drum protector. E. Baum, Philadelphia, Penn.
1,344,972. Resilient heel tread with soft rubber plugs. R. Armour, Providence, R. I.
1,344,986. Resilient wheel. A. H. Carlson, Butte City, Calif.
1,344,990. Shock absorbing wheel with pneumatic hub. R. R. à Court Beadon, Simla, Punjab, British India.
1,345,040. Hair curler with elastic band. O. E. Vandamark, Los Angeles, Calif.
1,345,046. Heat insulating fabric. F. V. Wedlock, assignor to Featheredge Rubber Co.—both of Chicago, Ill.
1,345,114. Cushion wheel. T. W. Arter, Bellaire, Ohio.
1,345,228. Tire. G. D. Pearson, Montreal, Quebec, Canada.
1,345,256. Elastic vehicle tire. W. E. Russell, Akron, Ohio.
1,345,269. Demountable rim for tires. O. Smith, Springfield, Tenn.
1,345,282. Demountable rim for tires. Victor R. Teague, Lovington, N. Mex.
1,345,313. Demountable rim for tires. W. W. Bowman, New York City.
1,345,332. Demountable rim for tires. M. Hollister, Jr., Fort Dodge, Iowa.

REISSUES.

14,900. Resilient wheel. W. A. Black, assignor to The Simplex Auto Wheel Co.—both of Spokane, Wash. (Original No. 1,277,537, dated September 3, 1918.)

THE DOMINION OF CANADA.

ISSUED JUNE 1, 1920.

200,462. Tire casing. H. E. Grabau, Long Island City, and A. C. Schwartz, New York City—both in N. Y., U. S. A.
200,510. Vehicle tire with air reservoirs. O. J. Eisele, N. Y. C., U. S. A.
200,538. Pneumatic reinforced tire. P. Huth, San Francisco, Calif., U. S. A.
200,567. Reinforced pneumatic tire. H. L. Ochs, Kansas City, Mo., U. S. A.
200,598. Ear stopper. B. T. Stair, Los Angeles, Calif., U. S. A. (See The India Rubber World, June 1, 1918, page 544.)
200,637. Solid rubber tire. The Dunlop Rubber Co., Ltd., Westminster, County of London, assignee of C. Macbeth and H. C. Young, both of Birmingham, County of Warwick—all in England.
200,644. Garter. The Kabo Corset Co., assignee of L. S. Florsheim—both of Chicago, Ill., U. S. A.

ISSUED JUNE 8, 1920.

200,789. Hat-pin protector connected with elastic band. J. B. Maserang, Belleville, Ill., U. S. A.
200,862. Vehicle wheel. The Eagle Wheel & Tire Co., Inc., assignee of J. E. Harrigan—both of New York City. (See The India Rubber World, April 1, 1919, page 369, and December 1, 1919, page 155.)

ISSUED JUNE 15, 1920.

200,943. Repair cover for pneumatic tires. F. W. Farr, Northampton, England.
201,018. Metal tire with pneumatic inner tube. J. L. A. Tetreault, Montreal, Quebec, Canada.
201,028. Cushion wheel. G. Zinsli, Sentinel Butte, North Dakota, U. S. A.
201,079. Milking machine teat cup. The Ridd Co., Limited, assignee of Ambrose Ridd—both of New Plymouth, New Zealand.

ISSUED JUNE 22, 1920.

201,106. Composite rubber and fabric top for cycles and similar saddles. J. Jelley, Coventry and H. Jelley, Birmingham—both in England.
201,184. Pneumatic rubber tire with air tight joints, etc. E. B. Killen, London, E. C. 4, England.
201,191. Device for attaching nipples, caps, etc. W. P. Limacher, Pasadena, Calif., U. S. A.
201,279. Endless belt. The Goodyear Tire & Rubber Co. of Canada, Limited, New Toronto, assignee of The Goodyear Tire & Rubber Co. of Canada, Toronto, assignee of A. M. Hardy, Bowmanville—all in Ontario, Canada.

ISSUED JUNE 29, 1920.

201,360. Spring tire. E. B. Esther, Missouri, U. S. A.
201,401. Automobile wheel with metallic tread encased in rubber. G. W. Sell, Portland, Ore., U. S. A.

THE UNITED KINGDOM.

ISSUED JUNE 2, 1920.

140,971. Self-filling fountain pen. H. A. Widmer, 32 Clerkenwell Road, London.
141,026. Tire valve. A. Schrader's Son, Inc., 783 Atlantic avenue, Brooklyn, New York, assignee of H. P. Kraft, 219 Godwin avenue, Ridgewood, New Jersey—both in U. S. A. (Not yet accepted.)
141,071. Fountain pen. J. Mallat, 53 Boulevard de Strasbourg, Paris. (Not yet accepted.)
141,075. Fountain pen. J. Mallat, 53 Boulevard de Strasbourg, Paris. (Not yet accepted.)

Chemical Patents will be found on pages 732, 733. Machinery Patents on pages 735, 736.

ISSUED JUNE 9, 1920

[illegible]

141,2[illegible]. Parlor golf. A. H. Laing, Ardis, Watling street Road, Fullwood, Preston, Lancashire.

141,297. [illegible] Broadway, New York City, U. S. A.)

141,405. Disk wheel with wooden rim recessed to hold pneumatic tire. W. E. Beasley, Rose Cottage, Cheddington, Buckinghamshire, and W. Beedle, Cornwall Villa, Weymouth street, and H. Everett, 376 St. Albans Road—both in Watford, Hertfordshire.

[illegible] pumps. Dunlop Rubber Co., 14 Regent [illegible] and H. F. Milward, 21 Bowyer Road, Alum Rock, Birmingham.

[illegible] Hypodermic syringe with rubber packing around needle. S. J. Everett, 393A, London Road, Thornton Heath, Surrey.

ISSUED JUNE 16 1920

[illegible] Rubber lined anti-splash device for faucet, etc. W. E. Bodycoat, Brookland House, Hamilton Road, Lincoln.

[illegible] Pneumatic tire with sponge rubber filler. C. L. Marshall, 27 Queen Victoria street, London.

141,517. Self-filling fountain pen. A. Gilbert, 18 Shore street, and A. [illegible]

141,541. [illegible] canvas band. C. H. Southall, 7 Vicker's avenue, Kirkstall, near Leeds, Yorkshire.

141,578. [illegible] V. P. Rawlings, [illegible] Dean's Yard, Westminster.

141,652. Rubber pad for protecting boot soles. F. E. Freeman, A. E. Derreck and G. L. Lovesey, Great Norwood street, Cheltenham, Gloucestershire.

[illegible] Resilient wheel having solid outer tire bearing on interior rubber tubes. L. M. Campi, New York City, U. S. A. (Not yet accepted.)

ISSUED JUNE 23, 1920.

[illegible] Resilient tires. F. L. Rapson, Childwall Hall, Liverpool.

141,927. Shock absorbing wheel [illegible] filler. F. L. Rapson, Childwall Hall, Liverpool.

142,014. Rubber heel. D. D. Granger, 82 South avenue, New London, Ohio, U. S. A.

142,019. Waterproof coat with lining or interlining provided with ventilating eyelets [illegible] position with eyelets on outer part, the outer eyelets being protected by an overhanging flap. W. I. Wolfe, 128 Islington, Liverpool.

142,023. Pneumatic wheel [illegible] circumferentially elastic. J. G. A. Kitchen, 7 Rose Bank, Scotforth, Lancaster.

142,029. Waterproof covers for saddles of cycles fitted with elastic bands. E. S. Lee, North street, Gosport, Hampshire.

142,044. [illegible] filler. F. L. Rapson, Childwall Hall, Liverpool. (See THE INDIA RUBBER WORLD, December 1, 1919, page 156.)

142,079. Pneumatic tire pressure gage. I. Pulverman, 222 Pennsylvania avenue. W. Warren, Penn., U. S. A. (Not yet accepted.)

ISSUED JUNE 30, 1920.

142,151. Petrol tank of celluloid covered with cork reinforced by canvas and vulcanized rubber, with or without sponge rubber. G. F. Linderwood, Croydon Road, Beckenham, Kent, and F. W. Osborne, Fredensborg, Tennyson, Mill Hill, London.

142,234. Horseshoe fitted with blocks of vulcanized rubber, etc. W. Bonson, Halefield, Hale, Altrincham, Cheshire.

142,238. Coffin with rubber packing between flanges of body and lid. F. Foy, Whin-Knowle, Kersal, Salford, Lancashire, and T. Downs, Stepping Hill, Hazel Grove, Cheshire.

142,307. Ventriloquial figure with lips and adjacent features formed of rubber to produce more life-like expression. F. O. Ellis, 40 Summercourt Road, Southend-on-Sea.

142,356. Sleeve for keeping ballonet inflated, leading to opening at nose of aerostat where external pressure is greatest. J. D. Mackworth, 17 Devonshire street, Portland Place, and E. G. Walker, 78 Cheyne court, Chelsea—both in London.

142,372. Auxiliary tire preventing damage to pneumatic tire after deflation. E. C. R. Marks, 57 Lincoln's Inn, Fields, London.

142,373. Apparatus for printing or marking fabrics laid over a curved table fitted with rubber impression pad. E. Sambrook and W. Howarth, Brooklands, and H. Smith Grasmere—both in Harrogate Road, and H. Naylor and H. Jennings, Green Lane Dyeworks—all in Yeadon, Yorkshire.

THE FRENCH REPUBLIC.

PATENTS ISSUED, WITH DATES OF APPLICATION

[illegible] matic tires. C. L. Marshall.

[illegible]7. (September 3, 1919.) Perfected elastic tire and method of [illegible]

[illegible]11. (September 9, 1919.) Improvement in tires. S. Kawanishi.

[illegible]

[illegible]70. (September 13, 1919.) Elastic tire. J. G. Krichel.

[illegible] tires and method of manufacture. E. Nelli.

GERMANY.

PATENTS ISSUED WITH DATES OF APPLICATION

[illegible] bottle. Carl Cale, Berlin.

[illegible]

324,881. (January 14, 1916.) Removable nipple with ventilating device at point where the nipple is inserted. Carl Cale, Berlin.

TRADE MARKS.

THE UNITED STATES.

N[illegible] surrounding a black triangle bearing the initials H. W.—boots and shoes of cloth, leather or rubber. H. Walker & Son (Leeds), Limited, Leeds, England.

[illegible] Representation of an eagle standing with one of its talons resting on a heraldic wreath or crest bar and holding in its other talon a catapult, the elastic of which it is pulling with its beak. W. J. Adams & Co., Limited, Manchester, England.

[illegible] The word OSBORN in outline letters within geometric figure.—Foundry supplies, molding machines and parts thereof, cores, stripping machines and vibrators. The Cleveland Osborn Manufacturing Co., Cleveland, Ohio.

[illegible] is superimposed the representation of a blow-out patch bear-[illegible] Durham, Salina, Kans.

120,491. The word [illegible] W. [illegible] New York City, assignor to Candy-Cake, Inc., Wilmington, Del.

120,730. The word WORLD—pneumatic tires. World Tire Corporation, Chicago, Ill.

120,993. The word HONESTY—men's, women's and children's shoes of leather, rubber, fabric and combination materials. International Shoe Co., St. Louis, Mo.

[illegible] The word "CHAMPION"—veterinary syringes, pill-injectors, milking tubes, teat-dilating tubes, etc. Becton, Dickinson & Co., Rutherford, N. J.

121,623. The words BEAR HUG above representation of a bear—puncture curing patches. W. F. Goddard, Moberly, Mo.

123,144. Representation of label bearing the words PARAMOUNT, NO METAL TOUCHES THE SKIN, and the figure of a man adjusting a garter, superimposed above a representation of the Paramount garter—garters, hose-supporters, armbands and [illegible]

[illegible] Representation of a label bearing design of a girl's head in [illegible] costume, looking through a tire, above the word [illegible]

[illegible] The word TRIMORE—pneumatic tires. The Lion Supply Co., La Fayette, Ind.

123,548. The words PENTO FOUNTAIN PEN and the representation of a fountain pen against a diagonally blue checkered background, [illegible] Limited, East Twickenham, England.

[illegible] The word ELASTICAPS—splice insulators for electric conductors. The Elasticap Co., Hoboken, N. J. (See THE INDIA RUBBER WORLD, March 1, 1920, page 366.)

[illegible] leather, canvas and balata belting, rubber and metallic hose, steam and hydraulic packing, and pneumatic tires. Delaware Electric & Supply Co., Wilmington, Del.

[illegible] matic tires. Racine Auto Tire Co., Racine, Wis. (See THE INDIA RUBBER WORLD, July 1, 1920, page 661.)

[illegible] The word ACORN above representation of an acorn—pneumatic tires and tubes. Acorn Tire & Rubber Co., Chicago, Ill.

[illegible] The word CLAUSS—rubber snips. The Henkel-Clauss Co., Fremont, Ohio.

[illegible] and shoes. Melville Shoe Corp., New York City.

[illegible] The words TINY TOT above the representation of a baby lying in a powder puff against a black circular disk surrounded by a narrow white circle—rubber sheeting. United Drug Co., Boston, Mass.

[illegible] The word REINDEER—tire casings and tubes. Achilles Rubber & Tire Co., Inc., Binghamton, N. Y.

[illegible] The letter A within outline of a spade spot—druggists' sundries, acid bottles, hard rubber gum for dental use, etc. American Rubber Co., Hempstead, N. Y.

[illegible] ing and roque balls. American Hard Rubber Co., Hempstead and New York City—both in New York.

[illegible] A double oval containing a four-sided figure with concave sides and ends, bearing the words BROWN MAKE, the figure 5, and two stars, beside the words BONE DRY—men's shoes made of a combination of leather, canvas and rubber material. Brown Shoe Co., Inc., St. Louis, Mo.

[illegible] The word TREDO in white letters on a black diamond—a preparation for filling cavities and healing cuts in rubber tires, shoes and other rubber goods. J. T. Flaherty, Springfield, Mass.

128,341. The words LISLE LASTIC superimposed against a blue background of conventional form—elastic and non-elastic braids. The Braided Fabric Co., Providence, R. I.

[illegible] The word CAMCO—canvas and rubber shoes, rubber soles and heels, rubber toe-boxes and rubber counters. W. MacPherson, Cambridge, Mass.

128,499. The word TEXSTAN—machinery packing made wholly or partly of rubber or having rubber incorporated therein. The B. F. Goodrich Co., New York City.

128,497. The word FRESHET—hose made wholly or partly of rubber. The B. F. Goodrich Co., New York City.

128,790. [illegible]

129,064. The letter [illegible] ornamental [illegible] rubber boots, rub-[illegible]

129,107. [illegible] New Brunswick, N. [illegible]

129,292. [illegible] land, Ohio.

129,293. [illegible] Cleveland, Ohio.

129,365. The word [illegible]—rubber tires and tubes for vehicles. Carlisle Tire & Rubber Co., Dover, Del., and Carlisle, Penn.
129,489. The word INANDOUT—dress shields. Brooklyn Shield & Rubber Co., Brooklyn, N. Y.
129,575. The word [illegible]—Safety goggles with elastic straps. The Standard Optical Co., Geneva, N. Y. (See THE INDIA RUBBER WORLD, June 1, 1920, page 519.)
129,580. Representation of a seal bearing around the edge the words R. T. VANDERBILT Co., N. Y. AMERICAN PRODUCTS and in the center the words DIXIE CLAY—clay used as filler in the manufacture of paper, paints and rubber products. R. T. Vanderbilt Co., Inc., New York City.
129,737. The word ACORN—tire vulcanizing apparatus. A. E. Nolan, Portland, Oregon.
129,920. The word COMETS—candy-coated chewing gum. Wm. Wrigley, Jr., Co., Chicago, Ill.
130,134. The words NATTY PAD—garters. G. Frost Co., Boston, Mass.
130,324. The word FREE—cycle handle bar grips. Essex Rubber Co., Trenton, N. J.
130,565. A black arrow behind a disk bearing a classical figure of an archer, above the words ROYAL ARCHER—rubber sheeting and rubber blankets. Archer Rubber Co., Milford, Mass.
130,566. A black arrow behind a disk bearing a classical figure of an archer, above the word TROJAN—rubber sheeting and rubber blankets. Archer Rubber Co., Milford, Mass.
130,881. Representation of label bearing the words TEABERRY—"IT'S ON THE LEVEL"—chewing gum. The D. L. Clark Co., Pittsburgh, Pa.
131,236. Facsimile of top of stopper bearing the words SAMPSON'S STOPPERS, having the initial and final S the same for both words, and two arrows, accompanied by the words EXPAND and CONTRACT, indicating direction in which to turn stopper—expanding and contracting rubber stoppers for bottles. The Sampson Appliance Corp., New York City. (See THE INDIA RUBBER WORLD, May 1, 1920, page 504.)
132,560. The word ADMIRAL—suspenders. The Russel Manufacturing Co., Middletown, Conn.
132,680. The word ARROW above representation of an arrow—garters and hose supporters. American Textile Products Co., Rochester, N. Y.
132,877. The word HOLLY—elastic webbing, garters, etc. McKenna & Robbins, New York City.

THE UNITED KINGDOM.

394,951. Representation of seal having a figure of a globe in the center, surrounded by 20 stars, and the words THE MANHATTAN RUBBER MFG. Co., PASSAIC, N. J., within the border consisting of concentric circles—rubber machine belting. The Manhattan Rubber Mfg. Co., 61 Willett street, Passaic, N. J., U. S. A.
398,825. Representation of an elephant running, accompanied by the words THORNHILL'S NON-SLIP SOLES—rubber soles and heels. B. A. Thornhill, Single Tree, Newera Eliya, Ceylon; and The Manor House, Pontesbury, Shropshire.
398,853. Representation of a rubber leaf, accompanied by the words RUBBER LEAF BRAND—footwear of leather, canvas, and rubber included in Class 38. The Kaufman Rubber Co., Limited, 410 King Street, West, Kitchener, Waterloo, Ontario, Canada.
400,853. The word MAGNUM—repair outfits for tires. The Dunlop Rubber Co., Limited, Dunlop House, 1 Albany Street, Regent's Park, London, N. W. 1.
401,036. The word VARICHOSETTE—surgical stockings, bands, etc. The Vena Appliances Co., 14 Florence Road, Bromley, Kent.
401,077. The words "JOHN BULL"—fountain and stylographic pens. John Bull, Limited, 93 Long Acre, London, W. C. 2.
401,078. The words THE "JOHN BULL" STYLE—stylographic pens included in Class No. 39. John Bull, Ltd., 93 Long Acre, London, W. C. 2.
401,079. The words THE "JOHN BULL" PEN—fountain pens included in Class No. 39. John Bull, Limited, 93 Long Acre, London, W. C. 2.
401,621. The word NONSOL—insulating tape, principally composed of rubber. Connolly Brothers Adhesive Tapes and Insulating Materials Co., 69 St. Stephen's Street, Salford, Manchester, Lancaster.
401,900. The word MELDIA within an ornamental geometric figure—sheet jointing, packing, tubular hose, printing roller composition, stoppers for bottles, billiard table cushions, balloon material. Meldia Mfg. Co., Limited, 10 Throgmorton avenue, London, E. C. 2.
401,973. Representation of a seal bearing the monogram M. D. on a black disk within a circle and beneath, the words "DE-FI-RANE" GUARANTEED WATERPROOF—articles of waterproof, rainproof and shower proof clothing. Martin Dilks & Co., 5, 16 and 18 Cank street, Leicester.
402,210. The word TANK—rubber erasers. H. A. Coombs, 10 Farringdon avenue, London, E. C. 4.
402,328. The word BOWBEN—rubber pads for boots and shoes. The Heel Guard Co., 44 Hurlon Road, Balham, London, S. W. 17.
402,853. Representation of a label bearing at left hand end the monogram C. P. M. C. above the word [illegible], at the right hand end the words GUARANTEED PREMIER QUALITY, 14 CARAT GOLD NIB and facsimile signature of John Whytwarth, in the center the words JOHN WHYTWARTH [illegible] MADE IN GREAT BRITAIN, and, beneath the address of the manufacturer—fountain and stylographic pens. J. Whytwarth, Limited, 14 Ivy Lane, Paternoster Row, London, E. C. 4.

B403,051. The representation of a flying eagle carrying arrows in its talons—fountain and stylographic pens and erasers. The Eagle Pencil Co., 703 East 13th street, N. Y. C., U. S. A.
B403,819. The word FEATHEREDGE—rubber sponges. Markt & Co., (London), Limited, 98 and 100, Clerkenwell Road, London, E. C. 1.

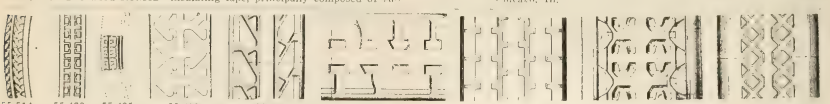
NEW ZEALAND.
TO AMERICANS.

16,031. Representation of seal having a figure of a globe in the center, surrounded by 20 stars and the words THE MANHATTAN RUBBER MFG. Co., PASSAIC, N. J., within the border consisting of concentric circles—belting, rubber tubes, carriage-aprons, bands, bags, bladders, buffers, rubber cloth, air-cushions, insulators, funnels, rubber door-mats, and all other goods made of rubber or gutta percha included in Class No. 40, except rubber pouches. The Manhattan Rubber Mfg. Co., 61 Willett street, Passaic, N. J., U. S. A.
16,242. Outline of a boomerang above the word BOOMERANG—goods manufactured from india rubber and gutta percha not included in classes other than No. 40. Barnett Glass Rubber Co., Limited, 289-293 Swanston street, Melbourne, Victoria, Australia.
16,322. The words BOSTON GARTER—garters, George Frost Co., 1551 Tremont street, Boston, Mass., U. S. A.
16,488. Representation of a tire—pneumatic and solid tires, inner tubes, tire accessories, mechanical rubber goods, druggists' sundries and all other goods manufactured from india rubber and gutta percha not included in classes other than No. 40. The F. E. Partridge Rubber Co., Limited, Guelph, Ontario, Canada.
16,489. The word "GUIDE" quoted—rubber footwear. The F. E. Partridge Rubber Co., Limited, Guelph, Ont., Canada.
16,490. The word "GUIDE" quoted—pneumatic and solid tires, tubes, accessories, mechanical rubber goods, druggists' sundries, and all goods manufactured from rubber and gutta percha not included in classes other than Class No. 40. The F. E. Partridge Rubber Co., Limited, Guelph, Ont., Canada.
16,542. The word PHILCO—rubber battery-plate separators or retainers. Philadelphia Storage Battery Co., Ontario and C streets, Philadelphia, Pa., U. S. A. (See description elsewhere in this issue.)
16,564. The word ALPCO—erasers, rubber bands, etc. American Lead Pencil Co., 173-175 Lower Clapton Road, London, E., England, and 220 Fifth avenue, New York City, U. S. A.
16,565. The word AURORA—erasers, rubber bands, etc. American Lead Pencil Co., 173-175 Lower Clapton Road, London, E., England; and 220 Fifth avenue, New York City, U. S. A.
16,566. The word VINDICTIVE—erasers, rubber bands, etc. American Lead Pencil Co., 173-175 Lower Clapton Road, London, E., England; and 220 Fifth avenue, N. Y. C., U. S. A.
16,617. Representation of a tire with a partridge standing within the lower part—rubber footwear. The F. E. Partridge Rubber Co., Limited, Guelph, Ontario, Canada.

DESIGNS.

THE UNITED STATES.

No. 55,411. Tire tread. Patented June 8, 1920. Term 14 years. A. L. Breitenstein, Akron, O., assignor to World Tire Corporation, Chicago, Ill.
55,414. Tire. Patented June 8, 1920. Term 3½ years. D. F. Crow, Omaha, Nebr.
55.416. Tire. Patented June 8, 1920. Term 14 years. J. W. Demead, Akron, Ohio.
55,419. Rubber shoe plate. Patented June 8, 1920. Term 7 years, D. H. Fley and T. H. Ryan, assignors to The Emory Rubber Sole Co., Inc. all of Norfolk, Va.
55,420. Tire. Patented June 8, 1920. Term 14 years. H. T. Gauss, Chicago, Ill.



55,514 55,420 55,425 55,411 55,416 55,437 55,459 55,506 55,507

55,425. Tire tread. Patented June 8, 1920. Term 7 years. W. Kline, Mogadore, O.
55,437. Tire. Patented June 8, 1920. Term 14 years. F. E. Shannon, Akron, O.
55,459. Tire. Patented June 15, 1920. Term 7 years. J. B. Gabeline, Burlington, assignor to Standard Four Tire Co., Keokuk—both in Iowa.
55,471. Advertising sign comprising a billboard within a colossal tire. Patented June 15, 1920. Term 7 years. R. R. Johnstone, Wauwatosa, Wis.
55,475. Tire cover. Patented June 15, 1920. Term 7 years. P. M. Lockwood, Kansas City, Mo.
55,506. Non-skid tire tread. Patented June 22, 1920. Term 14 years. E. N. Downes, assignor to J. & D. Tire Co.—both of Charlotte, N. C.
55,507. Non-skid tire. Patented June 22, 1920. Term 14 years. W. E. Duersten, New Castle, Pa.
55,528. Sole of a rubber boot or shoe. Patented June 22, 1920. Term 14 years. W. F. Piper, Melrose, assignor to Boston Rubber Shoe Co., Boston—both in Mass.
55,529. Sole of a rubber overshoe or similar article. Patented June 22, 1920. Term 14 years. W. F. Piper, Melrose, assignor to Boston Rubber Shoe Co., Boston—both in Mass.
55,5[illegible]. Tire rack, Patented June 29, 1920. Term 7 years. J. F. Brennan, Williamsport, Pa.

Review of the Crude Rubber Market.

NEW YORK.

When first latex crêpe was quoted on the spot at 30 cents during the last week of July, the low record was established for this standard grade. The absence of sellers and the lack of buying interest on the part of manufacturers were influencial factors in the support of the market.

Conditions in the plantation rubber market during the past month have been generally quiet and prices steady although the tendency has been downward. There was a marked scarcity of sellers, and other than dealers' business, little buying has been done as the manufacturers evidently believe that the bottom has not been reached. In fact, several large buyers became September sellers as futures were out of all proportion to spot quotations.

Parás have kept company with plantations being ruled by the same market conditions, but prices are believed to have reached rock bottom.

Spot and future prices for plantation and South American rubber at the beginning and toward the end of the month are shown in the following quotations:

Plantations. July 1, first latex crêpe, spot, 35 cents; July-September, 37 cents; October-December, 40¾ cents; January-June, 43½ cents.

July 26, first latex crêpe, spot, 32 cents; July-September, 33½ cents; October-December, 37 cents; January-June 42½ cents.

July 1, ribbed smoked sheets, spot, 35 cents; July-September, 36½ cents; October-December, 40¾ cents; January-June, 43½ cents.

July 26, ribbed smoked sheets, spot, 31½ cents; July-September, 33¼ cents; October-December, 36¾ cents; January-June, 42 cents.

July 1, No. 1 amber crêpe, spot, 38 cents.

July 26, No. 1 amber crêpe, spot, 30 cents.

July 1, No. 1 rolled brown crêpe, spot, 29 to 30 cents.

July 26, No. 1 rolled brown crêpe, spot, 27½ cents.

South American Parás and Caucho. July 1, upriver fine, spot, 35 to 36 cents; islands fine, 37 cents; upriver coarse, 26 cents; islands coarse, 21 cents; Cametá coarse, 20¼; caucho ball 27 cents.

July 26, upriver fine, spot, 34½ cents; islands fine, 33 cents; upriver coarse, 23 cents; islands coarse, 20 cents; Cametá coarse, 19 cents; caucho ball, 21 to 24 cents.

NEW YORK QUOTATIONS.

Following are the New York spot quotations, for one year ago, one month ago, and July 26, the current date:

	August 1, 1919.	July 1, 1920.	July 26, 1920.
PLANTATION HEVEA—			
First latex crêpe	$0.41 @ .41½	$0.35 @ .36	$0.32 @
Amber crêpe No. 1	.38 @	.38 @	.30 @
Amber crêpe No. 2	.37 @	.35 @ .36	.29 @
Amber crepe No. 3	.36 @	.34 @ .35	.28½ @
Amber crêpe No. 4	.35 @	.33 @ .34	.27½ @
Brown crepe, thick and thin clean	.35 @	.33 @ .35	.29 @
Brown crêpe, thin specky	.32 @	.31 @	.28 @
Brown crêpe, rolled	.29 @ .29½	.30 @	.26½ @ .27½
Smoked sheet, ribbed, standard quality	.40 @	.35 @	.31½ @
Smoked sheet, plain, standard quality	.39 @	.36 @	.30 @
Unsmoked sheet, standard quality	.38 @	.33 @	.25 @
Colombo scrap No. 1	.32 @	.30 @	.23 @
Colombo scrap No. 2	.30 @	.28 @	.21½ @
EAST INDIAN—			
Assam crêpe	*.58 @	@	@
Assam onions	@	@	@
Penang block scrap	*.40 @	@	@
PONTIANAK—			
Bandermassin	.12½ @	.12½ @	.12 @
Palembang	.14½ @	@	.13 @
Pressed block	.21½ @	.24 @	.23 @
Sarawak	.11 @	@	@
SOUTH AMERICAN—			
PARAS—			
Upriver fine	$0.54 @ .55	$0.35 @ .36	$0.34 @ .35
Upriver medium	*.52 @	.34 @	.30 @
Upriver coarse	.32 @	.26 @	.23 @
Upriver weak fine	.39 @	.33 @	.30 @
Islands, fine	.48 @	.37 @	.33 @
Islands, medium	*.44 @	.35 @	.30 @
Islands, coarse	*.21 @	.21 @	.20 @
Cametá, coarse	*.22 @	.20 @ .20¼	.19 @
Madeira, fine	.55 @	.40 @	.37 @
Acre Bolivian, fine	.55 @	.39 @	.36 @
Peruvian fine	.53 @	*.36½ @	.32 @
Tapajos fine	.53½ @	*.36 @	.30 @
CAUCHO—			
Lower caucho ball	.29 @	.27 @ .28	.21 @
Upper caucho ball	.48 @	.29 @	.24 @
MANICOBAS—			
Ceará negro heads	*.34 @	.25 @	@
Ceará scrap	*.29 @	.18 @	@
Manicoba, 30% guarantee	*.32 @	.24 @	@
Mangabeira thin sheet	*.38 @	.30 @	@
CENTRALS—			
Corinto scrap	.31 @	.22 @	.19 @
Esmeralda sausage	.31 @	.22 @	.19 @
Central scrap	.31 @	.21 @ .22	.19 @
Central scrap and strip	.29 @	.19 @ .20	.17 @
Central wet sheet	.20 @ .21	.15 @	.13 @
Guayule, 20% guarantee	.25 @	.27 @	.28 @
Guayule, washed and dried	.35 @	.37 @	.38 @
AFRICANS—			
Niger flake, prime	@	.16 @	.18½ @
Benguela, extra No. 1, 28%	.24 @	.21 @	.14 @
Benguela, No. 2, 32½%	.25 @	.19 @	@
Conaky niggers	@	.33 @	@
Congo prime, black upper	.35 @	.19 @	@
Congo prime, red upper	.35 @	@	@
Kassai black	@	@	@
Kassai red	@	.35 @	@
Massai sheets and strings	@	.33 @	@
Rio Nunez ball	@	.35 @	@
Rio Nunez sheets and strings	@	.34 @	@
GUTTA PERCHA—			
Gutta Siak	.22 @	.26 @	.24 @ .25
Red Macassar	2.60 @	2.75 @	2.80 @
BALATA—			
Block, Ciudad Bolivar	.78 @	.72 @	.72 @
Block, Colombia	.61 @ .62	.47 @	.50 @ .51
Surinam sheet	.93 @ .94	.79 @	.73 @
Surinam amber	.94 @ .95	.82 @	.82 @

*Nominal

RECLAIMED RUBBER.

A healthy request for reclaims has been maintained during July, although transportation facilities continue poor and deliveries uncertain. The mechanical goods factories were somewhat less busy than a month ago and there is an appreciable slowing down in tire production, resulting in easier conditions and lower prices for certain grades of reclaimed rubber.

NEW YORK QUOTATIONS.

July 26, 1920.

Prices subject to change without notice.

Standard reclaims:

Floating	$0.27	@ $0.32
Friction	.25	@ .30
Mechanical	.12	@ .13
Red	.22	@ .23
Shoe	.15¾	@ .16¼
Tires, auto	.16	@ .17
Tires, truck	.12½	@ .13½
White	.22	@ .25

THE MARKET FOR COMMERCIAL PAPER.

In regard to the financial situation, Albert B. Beers, broker in crude rubber and commercial paper, No. 1 Liberty street, New York City, advises as follows:

"During July the demand for commercial paper has been very limited, and almost entirely from out-of-town banks, rates ruling at 8¼ to 8½ per cent for the best rubber names, and even higher for those not so well known."

COMPARATIVE HIGH AND LOW NEW YORK SPOT RUBBER PRICES.

	July					
	1920.*		1919.		1918.	
PLANTATIONS—						
First latex crêpe..	$0.36	@ $0.32	$0.42½	@ $0.36½	$0.63	@ $0.63
Smoked sheet ribbed	.25½	@ .31½	.41	@ .38½	.62½	@ .62½
PARAS—						
Upriver, fine.......	.36¼	@ .34¾	.55¼	@ .55	.68	@ .68
Upriver, coarse	.32	@ .24	.33	@ .32	.40	@ .40
Islands, fine	.37	@ .33	.47½	@ .47½	.59	@ .59
Islands, coarse	.31	@ .21	.21½	@ .21½	.27	@ .27
Cametá	.20½	@ .19	.21½	@ .21½	.28	@ .28

*Figured to July 27.

SINGAPORE RUBBER MARKET.

GUTHRIE & CO., LIMITED, Singapore, report [June 10, 1920]:

Following advices of declining values in London and New York, the rubber auction opened yesterday to a considerably weaker market and prices of all grades show a substantial drop from last week. The highest paid for fine pale crêpe was 76½ cents (two special parcels sold at 77 cents), a decline of 5½/6 cents, while ribbed smoked sheet fetched up to 77 cents (paid for a few lots only), being 4½/5 cents down. Off quality sheet and crêpe was difficult of sale and sellers had to make considerable sacrifices on these grades to meet the market. Brown and dark crêpes were 6/8 cents down.

Demand was fairly good at the lower levels, but prices tended to sag during the course of the sale and the market closed distinctly weak with the prospect of a further decline.

Of 771 tons cataloged, 456 tons were sold.

The following is the course of values:

	In Singapore per Pound.[1]		Sterling Equivalent per Pound in London.	
Sheet, fine ribbed smoked	76c	@ 77c	1/11¾	@ 2/ 0
Sheet, good ribbed smoked.....	63	@ 75	1/ 8	@ 1/11½
Crêpe, fine pale..............	76	@ 76½	2/ 0¼	@ 2/ 0⅜
Crêpe, good pale............	65	@ 75½	1/ 9⅛	@ 2/ 0⅛
Crêpe, fine brown...........	58	@ 66	1/ 7⅛	@ 1/ 9⅜
Crêpe, good brown	48½	@ 57	1/ 4½	@ 1/ 6⅞
Crêpe, dark	41½	@ 54	1/ 2½	@ 1/ 6
Crêpe, bark	40	@ 45½	1/ 2	@ 1/ 3⅝

[1]Quoted in Straits Settlements currency; $1 = $0.567 United States currency.

AMSTERDAM RUBBER MARKET.

JOOSTEN & JANSSEN, Amsterdam, report [July 9, 1920]:

During the last week the market was firm, although interest was chiefly concentrated in First Qualities Hevea, whilst the lower grades found few or no buyers. Prices paid for Standard Qualities consequently improved from f. 1.16 to f. 1.30.

On the Terminal Market a large turn-over took place; July delivery improved from f. 1.14½ to f. 1.20, December from f. 1.24—f. 1.26, March from f. 1.27½ to f. 1.32½. The market closed easier, particularly for the further positions: July f. 1.20, October f. 1.22, December f. 1.25, March f. 1.29.

FEDERATED MALAY STATES RUBBER EXPORTS.

An official report from Kuala Lumpur states that the exports of plantation rubber from the Federated Malay States for the month of May amounted to 7,627 tons, compared with 8,375 tons in April and 7,308 tons in the corresponding month last year. The total exports for five months in the current year were 46,426 tons, against 43,623 tons for the corresponding period last year and 35,396 tons in 1918. Appended are the comparative statistics:

	1918.	1919.	1920.
January ....*tons*	7,588	7,163	11,119
February	6,820	10,809	9,781
March	7,709	10,679	9,524
April	7,428	7,664	8,375
May	5,851	7,308	7,627
Totals	35,396	43,623	46,426

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official report from Singapore states that the exports of plantation rubber from Straits Settlements ports in the month of May amounted to 15,617 tons (of which 2,788 tons were transshipments), against 15,720 tons in April and 15,845 tons in the corresponding month last year. The total shipments for the five months of the present year amount to 67,772 tons, compared with 77,666 tons last year and 35,665 tons in 1918. Appended are the comparative statistics:

	1918.	1919.	1920.
January ....*tons*	4,302	14,404	13,125
February	2,334	15,661	17,379
March	8,858	20,908	5,931
April	6,584	10,848	15,720
May	13,587	15,845	15,617
Totals	35,665	77,666	67,772

RUBBER EXPORTS FROM PENANG.

	January 1 to May 31	
	1919.	1920.
To Great Britain ....*piculs*[1]	93,377	95,194
Europe		945
United States	50,413	91,577
Totals	143,790	187,716

[1]One picul equals 133⅓ pounds.

PLANTATION RUBBER EXPORTS FROM JAVA.

	April.		Four Months Ended April 30.	
	1919.	1920.	1919.	1920.
To Netherlands.... ...*kilos*	.....	471,000	120,000	1,532,000
Great Britain	1,882,000	1,157,000	2,901,000	2,324,000
Germany	.....	18,000	.....	18,000
France	.....	.....	176,000	.....
United States	1,586,000	1,005,000	6,621,000	5,679,000
Singapore	600,000	538,000	1,991,000	1,708,000
Japan	53,000	47,000	178,000	178,000
Australia	.....	16,000	.....	16,000
Other countries	36,000	.....	175,000	.....
Totals	4,157,000	3,252,000	12,162,000	11,455,000
Ports of origin:				
Tandjong Priok	1,887,000	1,339,000	5,921,000	5,391,000
Samarang	47,000	36,000	203,000	186,000
Soerabaya	2,001,000	1,737,000	5,463,000	5,472,000

CEYLON RUBBER IMPORTS AND EXPORTS.

IMPORTS.

	January 1 to May 31.	
Crude rubber:	1919.	1920.
From Straits Settlements...............*pounds*	1,087,026	1,242,457
India	612,757	717,661
Burma and other countries...............	......	6,300
Totals	1,699,783	1,966,418

EXPORTS.

Crude rubber:		
To United Kingdom...............	15,227,401	13,015,130
Belgium	29,120	106,830
France	330,010	223,107
Germany	......	108,228
Netherlands	......	28
Italy	......	89,600
Australia	......	56
Victoria	89,785	5,440
United States	33,634,370	17,057,312
New South Wales	91,700	158,294
Canada and Newfoundland...............	260,016	425,600
India	1,977	586
Straits Settlements	424	44,800
Japan	121,741	155,427
Totals	49,786,544	31,390,438

(*Compiled by the Ceylon Chamber of Commerce.*)

CRUDE RUBBER ARRIVALS AT ATLANTIC AND PACIFIC PORTS AS STATED BY SHIPS' MANIFESTS.

PARAS AND CAUCHO AT NEW YORK.

	Fine.	Medium.	Coarse.	Caucho.	Totals. Pounds.
JUNE 28. By the S. S. *Gregory*, from Pará.					
Thornett & Fehr, Inc......	......	......	......	......	15,092
Neuss, Hesslein & Co......	......	......	......	......	15,582
Poel & Kelly...............	8,663	......	91,207	55,801	155,671
H. A. Astlett & Co..........	33,000	......	109,000	89,600	231,600
JUNE 28. By the S. S. *Gregory*, from Iquitos.					
Meyer & Brown, Inc........	......	......	......	......	1,568
Various	......	......	......	......	84,084
JUNE 28. By the S. S. *Gregory*, from Manáos.					
Meyer & Brown, Inc....	......	......	33,600	56,000	89,600
JUNE 30. By the S. S. *West Galeta*, from Montevideo.					
Various	......	......	......	......	8,030
JUNE 30. By the S. S. *Frankmere*, from Pará.					
Thornett & Fehr, Inc.......	......	......	......	......	11,368
Wm. Schall & Co............	30,571	......	13,272	15,373	59,216
Poel & Kelly...............	......	......	9,022	7,775	16,797
H. A. Astlett & Co.........	......	......	......	......	4,116
JULY 7. By the S. S. *Michael*, from Iquitos.					
Meyer & Brown, Inc.......	......	......	......	......	980
Various	......	......	......	......	41,258
JULY 7. By the S. S. *Michael*, from Manáos.					
Pell & Dumont, Inc.........	......	......	......	......	3,430
H. A. Astlett & Co	132,700	......	21,600	44,800	199,100
Poel & Kelly	36,327	......	12,861	213,585	262,773
G. Amsinck & Co., Inc..	......	......	......	......	7,742
W. R. Grace & Co..........	......	......	......	......	31,360
Meyer & Brown, Inc........	22,400	......	33,600	152,320	208,320
JULY 13. By the S. S. *Rembrandt*, from Rio de Janeiro.					
Wm. Schall & Co............	14,608	......	......	25,390	39,998
Poel & Kelly......	......	......	26,828	645	33,473
H. A. Astlett..........	4,300	......	3,100	......	7,400

PLANTATIONS.

(Figured 180 pounds to the bale or case.)

	Shipment from.	Shipped to	Pounds.	Totals.
June 16. By the S. S. *West Cadron* at San Francisco via Manila.				
Firestone Tire & Rubber Co.	Singapore	Akron	586,800	586,800
June 20. By the S. S. *[illegible]*, at San Francisco.				
Firestone Tire & Rubber Co.	Macassar	Akron	72,900	
Firestone Tire & Rubber Co.	Soerabaya	Akron	28,980	
Various	Soerabaya	San Francisco	54,000	
Various	Macassar	Akron	18,720	174,600
June 21. By the S. S. *Noordam*, at New York.				
Meyer & Brown, Inc.	Rotterdam	New York	33,600	33,600
June 23. By the S. S. *Tenyo Maru*, at San Francisco.				
Firestone Tire & Rubber Co.	Singapore	Akron	403,200	
Various	Singapore	San Francisco	47,700	450,900
June 25. By the S. S. *St. Paul*, at New York.				
F. B. Vandegrift & Co.	London	New York	720	
The Goodyear Tire & Rubber Co.	London	Akron	383,220	383,940
June 28. By the S. S. *Hakodate Maru*, at New York.				
Hood Rubber Co.	Colombo	Watertown	110,160	
L. Littlejohn & Co., Inc.	Colombo	New York	112,000	
Various	Colombo	New York	402,040	624,200
June 28. By the S. S. *Jason*, at New York.				
F. R. Henderson & Co.	Penang	New York	121,500	
L. Littlejohn & Co., Inc.	Penang	New York	60,300	
Rubber Trading Co.	Penang	New York	39,600	
Thornett & Fehr, Inc.	Penang	New York	40,500	
Edward Boustead & Co.	Penang	New York	94,140	
Joosten & Janssen	Penang	New York	100,800	
Various	Penang	New York	143,820	
Aldens' Successors, Inc.	Singapore	New York	14,580	
Baird Rubber & Trading Co.	Singapore	New York	112,000	
Thos. A. Desmond & Co.	Singapore	New York	50,400	
Vernon Metal & Produce Co.	Singapore	New York	187,200	
Rubber Trading Co.	Singapore	New York	96,480	
W. G. Ryckman, Inc.	Singapore	New York	14,400	
United States Rubber Plantations, Inc.	Singapore	Akron	648,000	
F. R. Henderson & Co.	Singapore	New York	17,640	
Meyer & Brown, Inc.	Singapore	New York	56,000	
General Rubber Co.	Singapore	New York	659,700	
J. Aron & Co.	Singapore	New York	29,160	
Balfour, Williamson & Co.	Singapore	New York	48,960	
Poel & Kelly	Singapore	New York	13,500	
Edward Maurer, Inc.	Singapore	New York	56,880	
L. Littlejohn & Co., Inc.	Singapore	New York	560,000	
Thornett & Fehr, Inc.	Singapore	New York	184,140	
Fred Stern & Co.	Singapore	New York	470,400	
Thornett & Fehr, Inc.	P't Sw't'nh'm	New York	33,840	
The B. F. Goodrich Co.	P't Sw't'nh'm	Akron	757,080	
Whitall Tatum Co.	P't Sw't'nh'm	New York	27,360	
Various	P't Sw't'nh'm	New York	117,000	
L. Littlejohn & Co., Inc.	Deli	New York	118,620	
East Asiatic Co., Inc.	Deli	New York	4,500	
E. S. Kuh & Valk Co.	Deli	New York	135,000	
Fred Stern & Co.	Deli	New York	98,640	
The Fisk Rubber Co.	Deli	Chicopee Falls	25,200	
W. R. Grace & Co.	Deli	New York	97,560	
Thornett & Fehr, Inc.	Deli	New York	18,000	
Aldens' Successors, Inc.	Deli	New York	126,000	
Poel & Kelly	Deli	New York	14,400	
Firestone Tire & Rubber Co.	Deli	Akron	253,800	
Various	Deli	New York	328,500	5,975,600
June 29. By the S. S. *Eastern Exporter*, at Seattle.				
Mitsui & Co., Limited	Yokohama	Seattle	54,000	
*C. Solomon, Jr.	Yokohama	San Francisco	149,940	203,940
June 29. By the S. S. *Protesilaus*, at Seattle.				
Firestone Tire & Rubber Co.	Hongkong	Akron	250,560	250,560
June 29. By the S. S. *Santa Cruz*, at San Francisco.				
Firestone Tire & Rubber Co.	Penang	Akron	196,020	
¶Firestone Tire & Rubber Co.	Singapore	Akron	320,940	516,960
June 30. By the S. S. *Navarino*, at New York.				
T. D. Downing & Co.	London	New York	247,140	
General Rubber Co.	London	New York	721,800	
Poel & Kelly	London	New York	245,880	
Baring Bros.	London	New York	466,540	
Various	London	New York	144,720	1,826,080
June 30. By the S. S. *Harold Dollar*, at New York.				
Suzuki & Co.	Singapore	New York	99,900	
Chas. T. Wilson Co., Inc.	Singapore	New York	568,260	
Weise & Co.	Singapore	New York	43,200	
Thornett & Fehr, Inc.	Singapore	New York	29,700	
The B. F. Goodrich Co.	Singapore	Akron	733,680	
Rubber Importers' & Dealers' Co.	Singapore	New York	283,680	
The Fisk Rubber Co.	Singapore	Chicopee Falls	308,160	
Meyer & Brown, Inc.	Singapore	New York	26,460	
L. Littlejohn & Co., Inc.	Singapore	New York	23,418	
Various	Singapore	New York	561,282	2,677,740
June 30. By the S. S. *Genoa Maru*, at New York.				
Mitsui & Co., Limited	Singapore	New York	100,800	
L. Littlejohn & Co., Inc.	Singapore	New York	112,300	
Various	Singapore	New York	172,820	385,920
June 30. By the S. S. *Siberia Maru*, at San Francisco.				
Gates Rubber Co.	Kobe	Denver	69,480	69,480
June 30. By the S. S. *Tjikembang*, at San Francisco.				
†The Goodyear Tire & Rubber Co.	Soerabaya	Akron	113,940	
‡The Goodyear Tire & Rubber Co.	Batavia	Akron	275,220	
Irwin-Harrison & Crosfield, Inc.	Batavia	New York	180	
Savage Tire Corp.	Soerabaya	San Diego	96,120	
§Firestone Tire & Rubber Co.	Batavia	Akron	133,920	619,380
July 1. By the S. S. *Samarinda*, at New York.				
Aldens' Successors, Inc.	Soerabaya	New York	261,720	
Fred Stern & Co.	Batavia	New York	174,720	
The B. F. Goodrich Co.	Batavia	Akron	73,980	
Robertson, Cole & Co.	Batavia	New York	36,000	
L. Littlejohn & Co., Inc.	Java	New York	268,800	
Manhattan Rubber Mfg. Co.	Batavia	Passaic	27,000	
G. Amsinck & Co., Inc.	Padang	New York	22,500	
Various	Batavia	New York	215,160	1,079,880
July 3. By the S. S. *Nordic*, at New York.				
Baring Bros.	Colombo	New York	50,400	
The Goodyear Tire & Rubber Co.	Colombo	Akron	225,540	
Chas. T. Wilson Co., Inc.	Colombo	New York	27,540	
Meyer & Brown, Inc.	Colombo	New York	56,000	
L. Littlejohn & Co., Inc.	Colombo	New York	67,200	426,680
July 3. By the S. S. *Vardulia*, at New York.				
The B. F. Goodrich Co.	Liverpool	Akron	10,260	10,260
July 6. By the S. S. *Volumnia*, at New York.				
The B. F. Goodrich Co.	Liverpool	Akron	8,820	8,820
July 6. By the S. S. *Urbino*, at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	36,000	
Various	Cochin	New York	114,480	150,480
July 6. By the S. S. *Minnekahda*, at New York.				
Various	London	New York	73,620	73,620
July 6. By the S. S. *Saugerties*, at New York.				
The B. F. Goodrich Co.	Batavia	Akron	178,380	
Kuharah Trading Co., Limited	Batavia	New York	70,560	
X. W. Obalski & Co., Inc.	Soerabaya	New York	24,480	
Fred Stern & Co.	Soerabaya	New York	112,000	
Kuharah Trading Co.	Soerabaya	New York	148,860	
Fred Stern & Co.	Singapore	New York	20,520	
L. Littlejohn & Co., Inc.	Java	New York	448,000	
Aldens' Successors, Inc.	Singapore	New York	12,600	
The B. F. Goodrich Co.	Singapore	Akron	449,820	1,465,220
July 6. By the S. S. *Western Knight*, at New York.				
Fred Stern & Co.	Soerabaya	New York	387,520	
Kuharah Trading Co., Limited	Soerabaya	New York	32,580	
Frank Waterhouse & Co.	Soerabaya	New York	15,120	
L. Littlejohn & Co., Inc.	Soerabaya	New York	200,800	
H. A. Astlett & Co.	Soerabaya	New York	7,740	
Winter, Ross & Co.	Soerabaya	New York	37,260	
F. R. Henderson & Co.	Soerabaya	New York	79,920	
H. A. Astlett & Co.	Singapore	New York	118,500	
Edward Boustead & Co.	Singapore	New York	136,800	
The B. F. Goodrich Co.	Singapore	Akron	246,780	
Meyer & Brown, Inc.	Singapore	New York	235,200	
Various	Java	New York	506,700	2,004,920

* 44 bales short.

¶ 1,083 packages short.

‡ 497 cases short shipped.

§ 12 cases short shipped.

PLANTATIONS.

	Shipment from.	Shipped to	Pounds	Totals
July 10. By the S. S. [illegible], at New York.				
Hood Rubber Co.......	Colombo	Watertown	47,160	
Hadden & Co.	Colombo	New York	22,320	
Manhattan Rubber Mfg Co.	Colombo	Passaic	113,400	
Meyer & Brown, Inc....	Colombo	New York	100,800	
L. Littlejohn & Co., Inc.	Colombo	New York	201,600	
Various	Colombo	New York	61,020	546,300
July 10. By the S. S. *Anglo Chilean*, at New York.				
Various	London	New York	1,151,640	1,151,640
July 13. By the S. S. *Kaiserin A. Victoria*, at New York.				
General Rubber Co......	Liverpool	New York	3,960	3,960
July 14. By the S. S. *Dardanus*, at New York.				
Aldens' Successors, Inc.	Soerabaya	New York	400,680	
H. A. Forbes & Co......	Batavia	New York	103,760	
F. R. Henderson & Co..	Batavia	New York	18,720	
Fred Stern & Co.......	Batavia	New York	134,400	
Robertson, Cole & Co...	Batavia	New York	61,560	
Manhattan Rubber Mfg. Co.	Batavia	New York	27,000	
Aldens' Successors, Inc..	Batavia	New York	152,640	
L. Sutro & Co..........	Batavia	New York	74,520	
United Malaysian Rubber Co., Limited	Batavia	New York	1,440	
Peninsular Trading Agency, Inc.	Soerabaya	New York	6,480	
Baird Rubber & Trading Co.	Singapore	New York	107,520	
Various	Batavia	New York	472,320	1,561,040
July 16. By the S. S. *Nile*, at San Francisco.				
Fred Stern & Co.......	Singapore	New York	168,560	
Various	Singapore	San Francisco	18,000	186,560
July 17. By the S. S. *Kinderdijk*, at New York.				
Meyer & Brown, Inc...	Rotterdam	New York	22,400	22,400
July 19. By the S. S. *Kongosan Maru*, at Seattle.				
Mitsui & Co., Limited...	Kobe	Seattle	76,500	76,500
July 21. By the S. S. *Oscar II*, at New York.				
General Tire & Rubber Co.	Christiana	Akron	2,520	2,520
July 22. By the S. S. *Muncaster Castle*, at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	268,800	
Fred Stern & Co.......	Singapore	New York	266,560	535,360
July 23. By the S. S. *Lieceric*, at New York.				
Fred Stern & Co.......	Singapore	New York	342,720	342,720
July 23. By the S. S. *Eurymachus*, at New York.				
Fred Stern & Co.......	Singapore	New York	170,240	170,240

BALATA.

	Shipment from.	Shipped to	Pounds	Totals
June 22. By the S. S. *Oranje Nassau*, at New York.				
Middleton & Co., Limited	Surinam	New York	4,222	4,222
June 24. By the S. S. *Santa Marta*, at New York.				
American Trading Co...	Cristobal	New York	3,000	3,000
June 30. By the S. S. *Maraval*, at New York.				
Middleton & Co., Limited	Cayenne	New York	6,710	6,710
July 1. By the S. S. *Zacapa*, at New York.				
Rafael del Castillo & Co.	Cartegena	New York	1,050	1,050
July 2. By the S. S. *Lakeview*, at New York.				
Antoine Chiris Co......	St. Laurent du Maroni	New York	5,400	5,400
July 7. By the S. S. *Colon*, at New York.				
Hollingshurst & Co.....	Cristobal	New York	4,800	
Various	Cristobal	New York	300	5,100
July 15. By the S. S. *Ancon*, at New York.				
J. S. Sembrada & Co., Inc.	Buenaventura	New York	7,570	7,570
July 21. By the S. S. *General G. W. Goethals*, at New York.				
Ultramares Corp.	Cristobal	New York	16,575	
A. M. Capens' Sons....	Cristobal	New York	2,550	19,120

CENTRALS.

	Shipment from.	Shipped to	Pounds	Totals
June 23. By the S. S. *Panuco*, at New York.				
Various	Puerto Mexico	New York	19,205	19,205
June 30. By the S. S. *Maraval*, at New York.				
South & Central American Commission Co...	Trinidad	New York	26,250	26,250
July 7. By the S. S. *Colon*, at New York.				
Wellman, Peck & Co....	Cristobal	New York	3,600	
Ultramares Corp.	Cristobal	New York	25,380	
Mecke & Co...........	Cristobal	New York	9,000	
Isaac Brandon & Bros..	Cristobal	New York	900	
Hollinghurst & Co......	Cristobal	New York	2,340	
Various	Cristobal	New York	2,520	43,740

	Shipment from.	Shipped to	Pounds	Totals
July 15. By the S. S. *Ancon*, at New York.				
De Lima, Correa & Cortissez, Inc............	Cristobal	New York	900	
G. Amsinck & Co., Inc..	Cristobal	New York	4,350	
J. S. Sembrada & Co...	Cristobal	New York	9,000	
Heilbron, Wolff & Co...	Cristobal	New York	7,050	
Various	Cristobal	New York	1,750	23,050
July 21. By the S. S. *Gen. G. W. Goethals*, at New York.				
A. M. Capens' Sons, Inc.	Cristobal	New York	5,100	
Pablo, Calvet & Co.....	Cristobal	New York	19,650	
Chas. E. Griffin........	Cristobal	New York	3,000	27,750

AFRICANS.

	Shipment from.	Shipped to	Pounds	Totals
June 28. By the S. S. *Niagara*, at New York.				
Various	Havre	New York	40,480	40,480
June 30. By the S. S. *Roman Prince*, at New York.				
Poel & Kelly...........	Havre	New York	34,991	34,991
June 30. By the S. S. *Nieuw Amsterdam*, at New York.				
Julius Schmid, Inc.....	Rotterdam	New York	7,360	
Various	Rotterdam	New York	93,725	101,085
July 6. By the S. S. *Clan MacKellar*, at New York.				
Various	African Ports	New York	6,785	6,785
July 7. By the S. S. *Luxpalite*, at New York.				
Poel & Kelly...........	Bordeaux	New York	27,444	27,444
July 12. By the S. S. *City of Birmingham*, at New York.				
Various	Beira	New York	4,500	4,500
July 13. By the S. S. *Rotterdam*, at New York.				
Various	Rotterdam	New York	131,790	131,790
July 15. By the S. S. *Chipana*, at New York.				
Baird Rubber & Trading Co.	Liverpool	New York	2,240	2,240
July 19. By the S. S. *Kinderdijk*, at New York.				
Various	Rotterdam	New York	44,850	44,850

PONTIANAK.

	Shipment from.	Shipped to	Pounds	Totals
June 28. By the S. S. *Jason*, at New York.				
Various	Singapore	New York	153,300	153,300
June 30. By the S. S. *Harold Dollar*, at New York.				
Baring Bros.	Singapore	New York	45,000	
L. Littlejohn & Co., Inc.	Singapore	New York	144,600	
Various	Singapore	New York	165,900	355,500
July 1. By the S. S. *Samarinda*, at New York.				
Various	Soerabaya	New York	25,500	25,500
July 6. By the S. S. *Saugerties*, at New York.				
H. A. Astlett & Co.....	Batavia	New York	3,000	3,000
July 14. By the S. S. *Dardanus*, at New York.				
E. Everett Carlton & Co.	Batavia	New York	134,400	
Various	Batavia	New York	108,000	242,400

GUAYULE.

	Shipment from.	Shipped to	Pounds	Totals
June 24. By rail at Eagle Pass, Texas.				
Continental-Mexican Rubber Co.	Mexico	Akron	108,405	108,405
June 26. By rail, at Laredo, Texas.				
Continental-Mexican Rubber Co.	Mexico	New York	58,000	58,000

GUTTA PERCHA.

	Shipment from.	Shipped to	Pounds	Totals
July 14. By the S. S. *Dardanus*, at New York.				
United Malaysian Rubber Co.	Batavia	New York	78,600	78,600

GUTTA SIAK.

	Shipment from.	Shipped to	Pounds	Totals
July 14. By the S. S. *Dardanus*, at New York.				
United Malaysian Rubber Co.	Batavia	New York	3,600	3,600

ANTWERP RUBBER ARRIVALS.

June 18. By the S. S. *Anversville*, from the Congo.	
Société Anonyme Bungé (Compagnie du Kasai)............*kilos*	98,300
Société Anonyme Bungé (Comptoir Colonial Belgika)..........	7,912
Société Anonyme Bungé (Compagnie du Congo Belge)..........	28,490
Société Anonyme Bungé	2,440
Crédit Colonial & Commercial (Anc. L. & W. Van de Volde)....	4,500
Various	1,789
	143,431
June 18. By the S. S. *Matadi*, from the Congo.	
Société Anonyme Bungé..................................	2,115

(*Compiled by Grisar & Co., Antwerp.*)

BRAZILIAN EXPORTS AND IMPORTS OF CRUDE AND MANUFACTURED RUBBER—1915-1919.

EXPORTS.

	1915		1916.		1917		1918.		1919.	
	Kilos	Milréis.	Kilos.	Milréis.	Kilos	Milréis.	Kilos.	Milréis.	Kilos.	Milréis.
Unmanufactured—										
Mangabeira	111,449	201,311	232,906	526,205	313,836	827,803	40,760	80,345	56,382	109,715
Maniçoba	3,499,160	9,676,775	2,394,138	7,595,142	2,089,504	5,716,046	405,044	1,092,845	945,583	2,040,626
Balata	4,650	8,059	....	.....	1,099	2,055	3,370	8,425	36,118	166,407
Hevea	31,550,464	125,899,159	28,865,297	144,113,000	31,589,518	137,524,274	22,210,916	72,543,245	32,213,311	103,220,001
Sorva	185	425	2,360	5,133	4,168	10,065	1,660	2,958	170	204
Totals	35,165,308	135,785,729	31,494,701	152,239,480	33,998,125	144,080,243	22,661,690	73,727,818	33,251,564	105,536,953

Hevea: The exports of *Hevea* from the Brazilian ports to foreign countries were as follows:

	1915 Kilos	1915 Milréis	1916 Kilos	1916 Milréis	1917 Kilos	1917 Milréis	1918 Kilos	1918 Milréis	1919 Kilos	1919 Milréis
From Manáos	13,176,624	59,956,751	12,990,975	70,850,060	14,033,845	66,494,666	8,255,754	28,040,599	13,999,389	47,572,459
Pará	17,444,889	62,721,369	15,189,178	70,182,664	16,826,956	67,210,805	13,523,585	42,474,083	17,763,054	53,854,334
Corumba	637,196	2,122,583	443,902	1,914,856	501,161	2,339,671	268,058	1,197,100	244,662	926,060
Other ports	291,755	1,098,456	241,242	1,165,420	227,556	1,479,132	163,519	831,463	206,206	867,148
Totals	31,550,464	125,899,159	28,865,297	144,113,000	31,589,518	137,524,274	22,210,916	72,543,245	32,213,311	103,220,001
Hevea:										
To United States	18,845,667	71,877,637	18,463,292	89,268,417	20,165,385	80,738,824	17,692,154	54,786,328	22,932,266	69,923,919
France	144,661	657,351	231,157	1,279,913	219,191	1,237,755	871,154	3,261,601	2,185,369	7,737,935
Great Britain	11,847,393	50,904,754	9,738,680	51,696,321	10,901,764	53,733,929	3,277,669	12,720,454	6,529,257	23,386,302
Uruguay	478,791	1,538,317	217,757	917,766	115,255	546,220	176,168	808,169	159,266	636,705
Other countries	233,952	921,100	214,411	950,583	187,923	1,267,546	193,771	966,693	407,153	1,535,140
Totals	31,550,464	125,899,159	28,865,297	144,113,000	31,589,518	137,524,274	22,210,916	72,543,245	32,213,311	103,220,001

IMPORTS.

	1915.		1916.		1917.		1918.		1919.	
	Kilos.	Milréis.	Kilos.	Milréis.	Kilos.	Milréis.	Kilos.	Milréis.	Kilos.	Milréis.
Manufactured—										
Toys	1,809	20,708	9,293	93,255	5,865	75,465	8,161	89,060	2,555	46,522
Boots and shoes	......	41,439	16,349	98,452	20,117	132,109	14,845	122,324	61,389	480,121
Tires and tubes for automobiles	438,322	2,274,478	547,314	3,164,200	513,511	3,546,593	345,273	2,552,605	650,669	5,087,981
Rubber in sheets	13,860	55,403	19,081	79,067	38,105	186,497	40,880	210,169	25,155	150,074
Hose	56,474	282,875	101,549	425,210	124,776	454,782	96,979	515,935	144,275	660,834
Solid Tires	43,069	124,628	141,928	508,220	128,410	411,368	80,639	232,369	159,778	509,871
Other rubber goods	129,504	994,980	234,020	2,230,552	172,200	1,780,896	191,339	2,309,476	323,993	2,735,291
Totals	683,038	3,794,511	1,069,534	6,598,956	1,002,984	6,587,710	778,116	6,031,938	1,367,814	9,670,694

The value of imports given is the c. i. f value of imports in Brazil, and, of course, does not include any taxes or duties payable after arrival at a Brazilian port. The value of exports is f. o. b. at the respective port of clearance in Brazil, appraised in accordance with the prices current at such port on the weight or quantities, gross or net, as the case may be, of the merchandise declared in the respective manifest, plus the cost of cartage, packing and loading charges and the export duties collected at the port of shipment. Freight and insurance being generally paid abroad are not included.

The coin in which values are given is the paper mil réis ($1), which during 1919 was on the average equivalent to $0.26 American currency. A kilo = 2.2 pounds.

EXPORTS OF INDIA RUBBER AND CAUCHO FROM MANAOS DURING MAY, 1920.

	EUROPE.					NEW YORK.					
Exporters.	Fine.	Medium.	Coarse.	Caucho.	Totals.	Fine.	Medium.	Coarse.	Caucho.	Totals.	Grand Totals.
Tancredo, Porto & Co......kilos	63,970	1,158	26,644	55,680	147,452	81,730	15,037	67,627	33,182	197,576	345,028
General Rubber Co. of Brazil	98,911	7,606	5,893	....	112,410	107,000	7,761	44,526	73,213	232,500	344,910
Stowell & Co	150,967	11,206	14,430	38,018	214,621	10,365	26,444	55,927	15,470	108,206	322,827
Ohliger & Co	52,539	....	....	....	52,539	52,595	9,005	4,301	20,713	86,614	139,153
Gomes & Co	23,290	320	600	....	24,210	....	....	....	....	....	24,210
Higson & Fall	520	14	2,520	3,281	6,335	1,825	350	1,782	13,850	17,807	24,142
Semper & Co	15,941	2,438	1,092	....	19,471	....	....	....	....	....	19,471
Amorim Irmãos	....	....	....	....	....	....	2,175	6,128	94	8,397	8,397
Oscar Ramos	3,530	....	2,550	425	6,505	....	....	....	....	....	6,505
Adelbert H. Alden, Limited	....	....	....	....	....	....	243	5,382	160	5,785	5,785
Moraes, Carneiro Co	2,843	317	181	160	3,501	....	....	....	....	....	3,501
Paulo Levy & Co	.....	....	2,574	52	2,626	....	....	....	....	....	2,626
I. G. Araujo	560	80	220	80	940	....	....	....	....	....	940
	413,071	23,139	56,704	97,696	590,610	253,515	61,015	185,673	156,682	656,885	1,247,495
In transit, Iquitos	176	1,838	640	495	3,149	9,699	32,537	7,788	112,058	162,082	165,231
Totals ......kilos	413,247	24,977	57,344	98,191	593,759	263,214	93,552	193,461	268,740	818,967	1,412,726

(*Compiled by Stowell & Co., Manáos, Brazil.*)

EXPORTS OF INDIA RUBBER AND CAUCHO FROM PARA AND MANAOS DURING MAY, 1920.

	EUROPE.					NEW YORK.					
Exporters.	Fine	Medium.	Coarse.	Caucho.	Totals.	Fine.	Medium.	Coarse.	Caucho.	Totals.	Grand Totals.
Suarez, Filho & Co......kilos	4,380	189	28	7,444	12,041	151,998	....	22,185	57,082	231,265	243,306
Alfredo Valle & Co	....	....	....	....	....	75,583	10,871	17,697	15,692	119,843	119,843
J. Marques	....	....	....	....	....	21,420	4,930	35,809	46,965	109,124	109,124
Berringer & Co	....	....	....	....	....	25,017	4,279	24,237	36,132	89,665	89,665
Ferreira, Costa & Co	....	....	....	....	....	....	....	....	50,000	50,000	50,000
Stowell & Co	19,976	....	....	....	19,976	2,210	340	26,447	....	28,997	48,973
Chamié & Koury, Limited	....	....	....	....	....	9,010	....	....	17,771	26,781	26,781
Bitar Irmãos	....	....	....	....	....	5,950	633	9,086	11,050	26,719	26,719
General Rubber Co	....	....	....	....	....	2,420	146	5,033	5,991	13,590	13,590
Sundries	69,196	4,480	5,321	782	79,779	12,655	137	2,090	....	14,882	94,661
	93,552	4,669	5,349	8,226	111,796	306,263	21,336	142,584	240,683	710,866	822,662
From Itacoatiara	....	....	....	....	....	5,040	360	3,560	3,840	12,800	12,800
From Manáos	413,151	23,059	56,484	97,616	590,610	253,515	43,685	58,713	57,212	413,125	1,003,735
Totals ......kilos	507,003	27,728	61,833	105,842	702,406	564,818	65,381	204,857	301,735	1,136,791	1,839,197

(*Compiled by Stowell & Co., Pará, Brazil.*)

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES, DURING THE MONTH OF MAY, 1920.

EXPORTED TO—	Belting. Value.	Hose. Value.	Packing. Value.	Boots. Pairs.	Boots. Value.	Shoes. Pairs.	Shoes. Value.	Soles and Heels. Value.	Automobile Tires. Casings. Value.	Automobile Tires. Inner Tubes. Value.	Automobile Tires. Solid Tires. Value.	Automobile Tires. All Others. Value.	Insulated Wire and Cables. Value.	Druggists' Rubber Sundries. Value.	All Other Manufactures of Rubber. Value	Totals. Value.
EUROPE:																
Austria									$56,061	$8,645						$64,706
Azores and Madeira Islands															$2	2
Belgium	$777	$129	$397			1,680	$1,415	$50	86,073	11,094			$5,048	$1,058	854	106,895
Bulgaria														200		200
Czechoslovakia									21,334	1,812		$10				23,156
Denmark		76				42,801	34,365		91,279	12,864	$20,523		7,636	5,272	8,929	180,944
Finland	1,634	474	99			30,162	30,577		27,281	10,839	26,856				6,939	104,699
France	15,334	55	692	144	$724	117,602	79,323		222,064	3,721		1,000	20,938	78,555	30,161	452,567
Germany	678								99,038	20,116		20	715		1,455	122,022
Gibraltar									1,108							1,108
Greece	2,127	61	1,488	12	50	132	140	620	43,159	10,097		6	383	150	1,455	59,736
Iceland and Faroe Islands				6,809	20,619	108	223		675	90			1,436		87	23,130
Italy	2,223			1	5	238	225	10,240	87,902	11,467			2,663	2,921	16,402	134,048
Malta, Gozo and Cyprus Islands															1,500	1,500
Netherlands	112	15,617	5,244			2,016	2,656		112,653	9,868	4,044	880	29,926	3,713	6,856	191,569
Norway	571	1,973		18	47	58,744	44,745		179,873	7,753	29,606	800	150,029	1,128	14,161	430,686
Poland and Danzig						4,152	3,371		35,394	400			1,130			40,295
Portugal	1,292	70		394	1,975				19,475	2,366		49	9,654	1,501	1,878	38,260
Roumania		2,887	1,799			110	245		4,535				8	200	37	9,711
Russia in Europe	899	1,118														2,017
Spain	1,109	1,098	641	152	490	57	67	1,378	186,682	34,262	27,933	1,898	5,023	6,911	13,880	281,372
Sweden	5,706	4,966	1,249			15,584	12,611		339,095	66,686	32,690	2,358	16,678	3,294	25,642	510,975
Switzerland	242	1,485	445			17,932	15,740		57,907	5,258			9,752	1,075	6,100	98,004
Turkey in Europe			641			1,402	1,373		12,152	142	254		2,018	538	180	17,298
England	15,511	29,517	1,684	6	35	172,936	136,185	1,030	317,041	10,665	10,000		35,169	40,526	129,664	727,027
Scotland			2,956			14,560	10,024		47,545	6,724					100	67,349
TOTALS, EUROPE	$48,215	$59,526	$17,335	7,536	$23,945	480,216	$373,285	$13,318	$2,048,326	$234,869	$151,906	$7,021	$298,206	$147,042	$266,282	$3,639,276
NORTH AMERICA:																
Bermuda	$1,043	$2,101	$202	62	$234	2,163	$2,760	$301			$337	$105	$240	$327	$700	$8,350
British Honduras	540					647	1,079		$222	$475			4	7	330	2,657
Canada	23,634	13,609	11,109	2,125	8,458	10,955	13,842	1,998	102,905	40,240	13,784	3,602	25,162	34,607	220,149	512,499
Costa Rica	663		94					877	539	5		39	3,134	304	1,030	6,685
Guatemala	6,049	1,723	883	12	55	499	578	2,154	3,514	1,367	383	623	10,193	452	977	28,951
Honduras	105	807	507			522	783	490	2,392	599	1,465	918	620	210	1,143	10,039
Nicaragua	865	493	622			1,480	1,852	956	1,217	61	540	20	300	650	1,904	9,480
Panama	69	4,006	3,468	30	106	13,893	16,788	575	18,333	2,698	183	107	29,956	909	4,728	81,926
Salvador		172	249					9,568	6,632	1,431	36	135	3,872		409	22,504
Mexico	38,495	57,178	14,341	69	419	22,328	22,591	7,158	71,462	8,158	4,788	2,192	30,922	15,764	36,550	310,018
Miquelon, Langley, etc				1,963	7,045										5	7,050
Newfoundland and Labrador	3,593	1,150	224	6,590	21,999	6,024	4,293	552	5,268	723	123		2,658	153	902	41,638
Barbados						402	542		1,805	228		113	80		303	3,071
Jamaica	1,084	1,184	112			4,667	5,816	169	13,826	1,666	823	83	446	192	986	26,387
Trinidad and Tobago		6	269	67	74	11,392	8,762	1,849	16,114	1,769	1,868	1,368	3,057	468	1,062	36,666
Other British West Indies	29	67				3,351	3,745	19	3,671	333	460	317	73	56	205	8,975
Cuba	19,049	26,459	42,535	156	736	76,658	68,222	14,961	282,085	34,004	58,312	17,702	56,036	18,974	56,164	695,239
Virgin Islands of U. S.	112					1,345	1,918	712	1,047	207		10		266	142	4,414
Dutch West Indies		318				1,447	2,145	128	1,427	166	4	28	84	85	289	4,674
French West Indies		21							689	82		9	890		85	1,776
Haiti	108	270	5	18	51	195	338	44	2,834	660	444	1,180	859	903	2,049	9,745
Dominican Republic	51	1,026	1,046			383	656	787	23,756	3,904	2,961	919	6,661	2,527	2,446	46,740
TOTALS, NORTH AMERICA	$95,489	$110,590	$75,660	11,092	$39,177	158,351	$156,710	$43,298	$559,738	$98,776	$86,511	$28,870	$175,247	$76,854	$332,558	$1,879,484
OCEANIA:																
Australia	$4,248	$6,693	$3,068						$73,380	$11,149	$7,354	$2,669	$3,000	$6,159	$13,874	$131,594
New Zealand	326	706	60	477	$1,402	384	$266	$8,567	130,982	7,987	4,194		11,580	317	4,246	170,633
Other British Oceania									725	774						1,499
French Oceania															33	33
Other Oceania									486	32				50		568
Philippine Islands	13,535	17,556	11,353	1,238	2,282	6,082	7,071	7,695	148,732	11,783	17,323	2,557	20,841	8,241	13,556	282,525
TOTALS, OCEANIA	$18,109	$24,955	$14,481	1,715	$3,684	6,426	$7,337	$16,262	$354,305	$31,725	$28,871	$5,226	$35,421	$14,767	$31,709	$586,852
SOUTH AMERICA:																
Argentina	$823	$6,634	$2,299	60	$142	4,434	$7,966	$2,797	$384,542	$37,106	$2,384	$2,296	$34,057	$11,918	$25,760	$518,724
Bolivia									3,918				3	137	629	4,687
Brazil	25,003	22,761	2,850	710	2,130	36,569	38,049	1,845	215,042	21,479	7,955	1,129	81,384	7,137	35,802	462,566
Chile	10,384	8,728	1,201	240	1,632	8,911	8,436	317	61,503	4,024	3,932	4,511	11,054	1,015	16,435	133,172
Colombia		2,418	238			1,741	2,287	3,249	24,029	4,070	800	250	14,186	4,196	4,076	59,793
Ecuador	8	350	356						3,213	139		30	6,130	1,578	739	12,543
British Guiana		81	195			2,878	3,198		1,428	277	604		170		357	6,310
Dutch Guiana									428			4,500		179	225	5,332
French Guiana									130	14						144
Paraguay													25		117	142
Peru	305	1,380	123			1,194	1,762		13,241	5,841	1,506	1,071	9,724	1,235	6,870	43,058
Uruguay	2,158	3,396	2,166	2	5	688	885	1,296	169,097	12,996	1,520	1,002	1,032	909	9,166	205,628
Venezuela	674	1,277	91					320	15,045	5,583	945	43	6,122	3,875	1,803	35,778
TOTALS, SOUTH AMERICA	$39,355	$47,025	$9,519	1,012	$3,909	$56,415	$62,583	$9,824	$891,616	$91,529	$19,646	$14,832	$163,887	$32,179	$101,973	$1,487,877

Asia:	Belting Value.	Hose. Value.	Packing. Value.	Boots. Pairs.	Boots. Value.	Shoes. Pairs.	Shoes. Value.	Shoes and Heels. Value.	Automobile Tires. Casings. Value.	Inner Tubes. Value.	Solid Tires. Value.	All Others. Value.	Insulated Wire and Cables. Value.	Druggists' Rubber Sundries. Value.	All Other Manufactures of Rubber. Value.	Totals. Value.
Aden	......	......	......	......	......	......	......	......	$2,217	$144	......	$378	......	......	......	$2,739
China	$2,443	$271	$1,032	......		474	$534	......	24,651	1,923	250	67	$101,725	$5,852	$4,334	143,690
Chosen	......	60	......	......		......	......	......	......	245		......	148	......	92	543
British India	......	3,371	159	1	82	466	469	$3,405	56,837	8,456	6,731	925	1,587	2,085	4,910	88,940
Straits Settlements	......	......	3,850	......		844	1,200	......	106,782	3,745	9,711	......	88	304	2,113	137,773
Other British East Indies	......	......	......	......	......	......	......	......	2,496	200	......	......	......	22	67	2,785
Dutch East Indies	......	2,788	650	......	......	......	......	......	188,714	10,574	85,674	459	1,024	2,035	3,125	295,043
French East Indies	......	......	......	......	......	......	......	......	555	......	......	......	40	......	......	595
Hongkong	......	489	2,416	24	108	2,770	3,119	......	1,687	......	......	......	3,304	89	1,369	12,720
Japan	8,800	14,766	11,375	1,152	3,589	45,078	49,227	......	78,238	4,358	1,168	4,232	2,401	83	34,410	212,648
Persia	......	......	......	......	......	......	......	......	......	......	......	......	......	857	5	862
Russia in Asia	......	33	......	......	......	......	......	......	......	......	......	......	......	......	......	33
Siam	......	......	......	......	......	......	......	......	2,500	......	800	131	......	10	103	3,544
Turkey in Asia	......	175	......	3	20	604	568	910	14,342	2,655	9,218	......	......	156	631	28,675
Other Asia	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
TOTALS, ASIA	$11,243	$21,953	$19,541	1,180	$3,719	50,236	$55,117	$4,315	$479,419	$32,298	$113,552	$6,8[illegible]	$110,378	$11,493	$51,159	$920,591
AFRICA:																
Belgian Kongo	......	$735	......	......	......	......	......	......	......	......	......	......	......	......	$194	$929
British West Africa	......	......	......	......	......	......	......	$250	$99,550	$6,359	$986	$42	......	$11	4	107,202
British South Africa	$35,938	28,359	$13,159	13	$67	4,849	$4,403	2,171	166,037	13,959	222	605	$6,168	$2,372	18,942	291,762
British East Africa	......	......	......	24	96	......	......	140	5,375	1,098	1,200	......	......	......	22	7,931
Canary Islands	......	......	......	......	......	......	......	......	337	......	700	......	......	10	50	1,097
French Africa	7,656	......		......	......	......	......	......	6,058	588	722	250	......	......	2,100	17,374
Liberia	......	......	......	......	......	......	......	......	......	......	......	......	......	......	12	12
Morocco	......	......	......	......	......	65	116	......	2,293	198		......	......	21	......	2,628
Portuguese Africa	71	......	......	......	......	......	......	......	1,830	......			11	114	439	2,465
Egypt	......	4,112	......	......	......	15	30	......	15,593	1,733		10	1,985	118	592	24,173
TOTALS, AFRICA	$43,665	$33,206	$13,459	37	$163	4,929	$4,549	$2,561	$297,068	$22,935	$3,830	$907	$8,164	$2,646	$22,355	$455,508
GRAND TOTALS	$256,076	$297,255	$150,001	22,572	$74,597	756,613	$659,581	$89,578	$4,630,072	$512,132	$404,316	$63,659	$791,303	$284,981	$806,036	$9,019,587

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORY OF THE UNITED STATES.

	Belting, Hose and Packing. Values.	Boots and Shoes. Pairs.	Boots and Shoes. Value.	Tires. Automobile Value.	Tires. All Others. Value.	Insulated Wire and Cables. Value.	Druggists' Rubber Sundries. Value.	All Other Manufactures of Rubber. Value.	Totals. Value.
Hawaii	$18,873	......	......	$92,078	$14,516	......	......	$19,235	$144,702
Porto Rico	10,119	......	......	89,751	9,509	......	......	20,933	130,312
TOTALS	$28,992	......	......	$181,829	$24,025	......	......	$40,168	$275,014

(Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.)

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	May. 1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
UNMANUFACTURED—free:				
India rubber				
From France	165,219	$46,944	229,198	$50,430
Netherlands	......	......	370,737	163,888
Portugal	84,822	23,750	89,391	22,766
United Kingdom	2,702,208	1,299,935	9,017,369	4,067,994
Canada	94,343	42,816	3,970	1,751
Central America	88,606	23,879	19,901	7,842
Mexico	118,215	61,995	200,289	53,595
Brazil	4,523,797	1,319,498	3,216,017	824,988
Peru	86,584	34,212	114,308	33,794
Other South Am.	56,841	19,175	94,654	42,380
British E. Indies	42,842,093	17,628,968	22,843,746	11,137,937
Dutch E. Indies	4,254,278	1,774,146	7,195,829	3,177,985
Other countries	461,175	167,199	705,393	203,200
Totals	55,478,181	$22,441,617	44,099,902	$19,788,550
Balata	53,370	$25,826	19,127	$9,033
Guayule	565,652	142,285	206,946	42,043
Jelutong (Pontianak)	1,597,331	207,256	684,878	137,554
Gutta percha	744,486	116,722	246,589	48,446
Rubber scrap	1,451,278	119,573	1,081,244	78,757
Totals, unmanufactured	59,890,298	$23,053,279	46,338,686	$20,104,383
Chicle (dutiable)	493,477	$348,529	673,977	$434,544
MANUFACTURED—dutiable:				
India rubber and gutta percha		123,016	......	85,417
India rubber substitutes	48,532	3,636	......	......

EXPORTS OF DOMESTIC MERCHANDISE.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
MANUFACTURED—				
India rubber:				
Scrap and old	989,165	$28,049	1,254,641	$119,018
Reclaimed	67,303	35,021	757,178	125,814
Belting[1]	......	638,348	......	256,076
Hose[1]	......		......	297,255
Packing[1]	......		......	150,001
Boots[1]	21,243	57,762	22,572	74,597
Shoes[1]	185,707	154,440	756,613	659,581
Soles and heels[1]	......	......	......	89,578
Tires:				
For automobiles[1]	......	2,360,279	......	......
Casings[1]	......		......	4,630,072
Inner tubes[1]			......	512,132
Solid tires	......		......	404,316
All other tires	......	190,725	......	63,659
Druggists' rubber sundries[1]	......	126,296	......	284,981
Suspenders and garters	......	177,641	......	489,285
Other rubber manufactures[1]	......	796,068	......	806,036
Totals, manufactured	......	$4,564,629	......	$8,962,401
Fountain pens... *number*	34,600	$30,753	42,107	$35,133
Insulated wire and cables[1]	......	838,188	......	791,303

EXPORTS OF FOREIGN MERCHANDISE.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
UNMANUFACTURED				
India rubber	374,738	$134,699	550,755	$239,368
Balata	23,240	15,250	202,100	121,460
Gutta percha	......	......	1	2
Guayule	......		25	31
Jelutong (Pontianak)	......	......	92,940	18,478
Rubber scrap	......	......	10,600	875
Totals, unmanufactured	......	$149,949	......	$380,214
MANUFACTURED—				
Gutta percha	......	$8,000	......	$149
Totals, manufactured	......	$8,000	......	$149
India rubber substitutes	......	125	......	30
Chicle	70	130	......	......

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
MANUFACTURED—				
To Alaska:				
Belting, hose and packing	......	$10,282	......	$25,431
Boots and shoes... *pairs*	9,900	24,212	504	1,588
Other rubber goods	......	4,608	......	3,856
Totals	......	$39,102	......	$30,875
To Hawaii:				
Belting, hose and packing	......	$6,718	......	$18,873
Automobile tires	......	78,569	......	92,078
Other tires	......	11,562	......	14,516
Other rubber	......	11,431	......	19,235
Totals	......	$111,280	......	$144,702
To Porto Rico:				
Belting, hose and packing	......	$1,868	......	$10,119
Automobile tires	......	15,230	......	89,751
Other tires	......	1,055	......	9,509
Other rubber goods	......	2,718	......	20,933
Totals	......	$20,871	......	$130,312

To Philippine Islands treated as foreign commerce.

[1]Details of exports of domestic merchandise by countries during May are given on pages 776-777 of this issue.

CUSTOM HOUSE STATISTICS.

PORT OF NEW YORK.

IMPORTS.

	May. 1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
Unmanufactured *free:*				
Crude rubber:				
From Belgium	......	......	296,404	$83,596
France	165,219	$46,044	229,198	50,430
Netherlands	......	......	370,737	163,888
Portugal	84,822	23,750	89,391	22,766
Spain	......	...	161,584	23,837
England	2,646,174	1,272,478	9,017,289	4,067,946
Canada	70,455	32,234	......	......
Costa Rica	3,278	1,577	223	80
Gautemala	......	......	380	95
Honduras	102	200	......	......
Nicaragua	61,604	16,009	6,547	2,377
Panama	2,343	434	7,041	2,648
Salvador	......	......	5,710	2,642
Mexico	61,995	118,215	65,514	24,645
Trinidad	1,972	1,073	......	......
Cuba	......	......	44,008	15,400
Bolivia	......	......	5,809	2,971
Brazil	4,523,797	1,319,498	3,216,017	824,988
Columbia	18,762	8,296	32,969	17,335
Ecuador	26,197	7,313	18,034	4,104
British Guiana	......	......	1,295	961
Peru	86,584	34,212	114,308	33,794
Venezuela	3,566	11,882	36,547	17,009
China	......	......	149,800	59,920
British India	4,050	1,863	357,558	112,063
Straits Settlements	15,021,616	6,160,984	16,172,710	7,965,075
British E. Indies.	6,776,693	3,087,242	4,917,333	2,265,126
Dutch E. Indies.	2,255,662	952,591	6,981,431	3,083,450
Philippines	120,286	51,030	......	......
Belgian Kongo	67,020	12,686	......	......
British W. Africa.	78,057	15,876	18,473	2,609
Totals	32,080,254	$13,175,487	42,316,310	$18,849,755
Jelutong (Pontianak):				
From Straits Settlements	1,413,014	$189,262	402,665	$77,268
Dutch E. Indies.	......	......	271,044	58,106
Totals	1,413,014	$189,262	673,709	$135,374
Gutta Percha:				
From England	169,813	$34,326	......	......
Straits Settlements	574,673	82,396	......	......
Dutch E. Indies.	......	......	227,892	$43,122
British W. Africa	......	......	8,302	2,013
Totals	744,486	$116,722	236,194	$45,135
Balata:				
From Panama	17,312	$7,143	......	......
Colombia	13,369	6,155	16,380	$6,299
British Guiana	......	......	2,747	2,734
Venezuela	22,689	12,528	......	......
Totals	53,370	$25,826	19,127	$9,033
Reclaimed and rubber scrap.	559,007	$58,020	751,095	$56,642
Totals, unmanufactured	34,914,774	$13,500,683	43,996,435	$19,095,939
Manufactures of rubber and gutta percha...*dutiable*	......	24,133	......	65,255
Rubber substitutes	48,532	3,626	......	......
Chicle ...*dutiable*	160,751	$99,144	431,274	$294,961

EXPORTS OF DOMESTIC MERCHANDISE.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
Manufactured:				
Automobile tires	......		......	$3,858,994
Inner tubes	......	$2,027,795	......	391,995
Solid tires	......		......	346,685
All other tires	......	177,575	......	47,456
Belting	......		......	183,857
Hose	......	431,255	......	205,905
Packing	......		......	90,594
Rubber boots ...*pairs*	9,065	21,985	12,354	38,687
Rubber shoes ...*pairs*	145,588	108,849	524,633	452,906
Soles and heels	......	......	......	56,439
Druggists' sundries	......	94,098	......	234,956
Other mfgs. of rubber	......	539,668	......	495,931
Totals, manufactured	......	$3,401,225	......	$6,404,405
Insulated wire	......	724,646	......	724,506
Fountain pens...*number*	29,803	35,613	34,255	23,951
Suspenders and garters.	......	149,953	......	421,714
Chewing gum	......	52,741	......	112,369
Unmanufactured:				
Reclaimed and scrap rubber	120,694	$25,299	847,050	$109,741

FOREIGN EXPORTS.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
Crude rubber	10,675	$5,000	26,871	$11,933
Balata	23,240	15,250	202,100	121,460
Chicle	25	20	......	......
Rubber manufactures	......	7,581	....	149
Rubber substitutes	......	......	125	30
Rubber scrap	......	.. ..	10,000	875

PORT OF NEW ORLEANS.

IMPORTS.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
Unmanufactured—*free:*				
Crude rubber:				
From Nicaragua	21,122	$5,727	......	......
Mexico	......	......	300	$68
Totals	21,122	$5,727	300	$68
Chicle	15,200	10,729	6,260	8,719

EXPORTS.

	May. 1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
Manufactured:				
Automobile tires	......		......	$48,128
Inner tubes	......	$3,842	......	7,699
Solid tires	......		......	1,155
All other tires	......	272	......	1,415
Belting	......	6,532	......	1,087
Hose	......	......	......	4,923
Packing	......	....	......	2,601
Rubber boots	106	268	16	35
Rubber shoes	3,982	3,993	9,251	12,546
Soles and heels	......	.....	......	2,525
Druggists' sundries	......	990	......	75
Other rubber manufactures	......	688	......	7,050
Totals	4,088	$16,585	9,267	$89,239
Insulated wire	......	$2,264	......	$6,900
Fountain pens	......	6	......	74
Suspenders	......	2,007	......	8,265
Chewing gum	......	2,171	......	2,174

PORT OF BOSTON.

IMPORTS.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
Unmanufactured *free:*				
Crude rubber:				
England	56,034	$27,457	80	$48
Canada	......	......	3,070	1,751
Straits Settlements	73,800	33,490	6,900	4,665
British East Indies	30,280	8,490	......	......
Totals	160,114	$69,437	10,050	$6,464
Gutta percha	......	......	10,231	3,290
Rubber scrap	23,520	840	......	......
Rubber manufactures, *dutiable*	......	3,871	......	1,411

EXPORTS.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
Manufactured:				
Automobile tires	......		......	$16,490
Inner tubes	......	$894	......	249
Solid tires	......		......	1,061
All other tires	......	39	......	......
Belting	......	9,814	......	3,742
Packing	......	......	......	478
Hose	......	.. ...	......	2,062
Rubber boots	4,207	9,428	3,309	11,233
Rubber shoes	2,755	2,339	191,847	158,203
Soles and heels	......	......	......	14,363
Druggists' sundries	......	6,239	......	6,208
All other manufactures of rubber	......	46,124	......	38,040
Totals	6,962	$74,877	195,156	$252,129
Insulated wire	......	$1,386	......	$872
Fountain pens	......	......	30	90
Suspenders	......	6,081	......	38,994
Chewing gum	......	39	......	......
Rubber scrap	23,256	2,451	......	......

PORT OF SEATTLE.

IMPORTS.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
Unmanufactured— *free:*				
Crude rubber:				
From Canada	1,620	$566	......	......
China	112,000	44,800	......	......
Straits Settlements	10,574,759	4,345,763	111,970	$48,000
British East Indies	137,900	58,850	......	......
Dutch East Indies	53,375	24,018	......	......
Hongkong	38,080	15,232	180	90
Japan	41,640	25,230	......	......
Totals	10,959,374	$4,514,459	112,150	$48,090
Jelutong	92,900	$9,290	......	......
Rubber manufactures	......	7	......	$166

EXPORTS.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
Manufactured:				
Automobile tires	......		......	$69,987
Inner tubes	......	$3,179	......	7,335
Solid tires	......		......	7,335
All other tires	......	347	......	611
Belting	......	4,223	......	6,986
Hose	......	......	......	12,222
Packing	......	......	......	578
Rubber boots	236	1,100	229	1,042
Rubber shoes	1,730	1,903	39	38
Rubber soles and heels	......	......	......	7,287
Druggists' sundries	......	442	......	123
Other rubber manufactures	......	1,974	......	2,963
Totals	1,966	$13,168	268	$116,507
Insulated wire	......	$34	......	$454
Fountain pens	......	11	2,880	2,465
Chewing gum	......	11	......	702
Suspenders	......	2,742	......	1,422
Reclaimed rubber	70,400	563	44,634	1,765

PORT OF SAN FRANCISCO.

IMPORTS.

	1919. Pounds.	1919. Value.	1920. Pounds.	1920. Value.
Unmanufactured—*free:*				
Crude rubber:				
From Guatemala	60	$30	......	......
Straits Settlements	6,854,978	2,630,057	1,036,866	$601,766
British East Indies	570,400	184,313	......	......
Dutch East Indies	1,945,241	797,537	131,349	56,664
Hong Kong	2,120	1,272	......	......
Japan	......	......	34,944	17,748
Totals	9,372,799	$3,613,209	1,203,159	$676,178

PORT OF SAN FRANCISCO—Continued.

IMPORTS.

	May.			
	1919.		1920.	
	Pounds.	Value.	Pounds.	Value.
Unmanufactured *free* (Continued):				
Rubber scrap and reclaimed	5,100	$2,520	11,169	$2,180
Jelutong	91,417	8,704	11,169	$2,180
Chicle	40,202	44,281	......	......
Rubber manufactures	....	8,258	......	482

EXPORTS.

Manufactured:				
Automobile tires	......	$146,453	......	$173,286
Inner tubes	.....		.....	23,662
Solid tires	......			15,225
All other tires	......	5,057	..	1,038
Belting	......	54,717	.	31,354
Hose	......	......	......	19,348
Packing	......	....	......	24,436
Rubber boots	147	191	96	378
Rubber shoes	7,831	5,251	3,011	3,320
Soles and heels	......	.....	......	3,318
Druggists' sundries	......	1,620	......	7,585
Other rubber manufactures	......	32,041	......	32,150
Totals	7,978	$245,330	3,107	$335,200
Insulated wire	...	$90,491	....	$8,250
Fountain pens	1,672	962	......	754
Suspenders and garters	......	7,367	.....	3,157
Chewing gum	......	852	......	1,778
Unmanufactured *free*:				
Reclaimed and scrap rubber	4,000	200	179,118	8,901

REEXPORTS.

Gutta percha	......	.. ..	1	$2
Rubber manufactures	.....	$4	......	......

UNITED KINGDOM RUBBER STATISTICS.

IMPORTS.

	May.			
	1919.		1920.	
	Pounds.	Value.	Pounds.	Value.
Unmanufactured—				
Crude rubber:				
From—				
Straits Settlements	6,211,700	£638,041	1,081,200	£126,976
Federated Malay States	6,555,100	673,939	2,902,000	340,596
British India	666,100	67,463	1,347,500	157,435
Ceylon and Dependencies	3,464,400	352,028	1,537,700	169,157
Other Dutch possessions in Indian Seas	2,022,000	199,663	372,700	44,672
Dutch East Indies (except other Dutch possessions in Indian Seas)	120,700	12,910	638,600	75,987
Other countries in East Indies and Pacific, not elsewhere specified	425,800	49,118	188,300	21,079
Brazil	2,183,000	229,168	2,988,600	310,858
Peru	27,200	2,521	1,000	31
South and Central America (except Brazil and Peru)	104,700	9,589	16,200	1,590
West Africa:				
French West Africa	10,400	790	540,500	47,502
Gold Coast	6,000	633	500	22
Other parts of West Africa	202,900	18,651	76,000	5,957
East Africa (including Madagascar)	181,500	17,728	143,200	15,110
Other countries	62,200	6,184	199,900	18,493
Totals	22,243,700	£2,278,426	12,033,900	£1,335,465
Waste and reclaimed rubber	412,200	7,856	1,093,800	29,931
Totals, unmanufactured	22,655,900	£2,286,282	13,127,700	£1,365,396
Gutta percha and balata	319,800	50,593	980,100	174,813
*Rubber substitute	....	....	44,800	1,700

*Included in "Other Articles," Class III, T., prior to 1920.

Manufactured—				
Boots and shoes...*dozen pairs*	3,297	£5,445	29,726	£79,943
Waterproofed clothing	....	....	....	1,258
Tires and tubes	....	148,255	. .	315,041
Insulated wire	....	483	.....	2,197
Other rubber manufactures	....	56,100	.	63,202
Totals	....	£210,283	.....	£461,641

EXPORTS.

Unmanufactured—				
Waste and reclaimed rubber	602,900	£15,656	1,741,200	£36,204
*Rubber substitutes	......	.....	167,700	7,562
Totals	.....	.....	.....	£43,766

*Included in "Other Articles," Class III, T., prior to 1920.

Manufactured—				
Boots and shoes..*dozen pairs*	4,982	£14,647	13,752	£30,852
Tires and tubes	....	466,277	......	483,176
Waterproofed clothing	.....	97,635	.....	256,498
Insulated wire	....	75,279	....	142,619
Submarine cables	....	37,344	....	107,527
Other rubber manufactures	....	235,933	......	400,202
Totals	....	£927,115	.....	£1,420,874

EXPORTS—COLONIAL AND FOREIGN.

Unmanufactured—				
Crude rubber:				
To Russia	193,300	£13,351	6,500	£620
Sweden, Norway and Denmark	577,400	74,974	357,000	35,701
Germany	12,200	1,216	1,344,900	139,660
Belgium	450,500	40,901	274,000	30,975
France	1,844,900	219,843	3,345,900	400,825
Spain	30,500	2,883	32,300	3,786
Italy	1,378,300	145,616	704,100	86,833
Austria-Hungary	....	....	62,400	6,692
Other European countries	321,500	35,075	67,800	7,228
United States	2,863,100	279,496	4,713,600	554,515
Canada	487,500	48,880	449,300	52,663
Other countries	60,600	7,216	219,500	27,299
Totals, rubber	8,129,800	£869,451	11,577,900	£1,346,797
Waste and reclaimed	500	27	16,300	664
Gutta percha and balata	233,000	25,863	171,700	32,298
Totals, unmanufactured	8,363,300	£895,341	11,765,900	£1,379,759
Manufactured—				
Boots and shoes..*dozen pairs*	2,337	£4,613	21	£191
Tires and tubes	....	21,341	....	10,941
Insulated wire	....	25	.....	97
Other manufactures	....	7,885	....	6,040
Totals, manufactured	....	£33,864	.....	£17,269

TABLE TO REDUCE POUNDS, KILOGRAMS, POUDS OR KINS TO TONS (APPROXIMATELY).

Pounds or Kilograms.	Pounds to Tons.	Kilograms to Tons.	
90,000,000	40,178	88,582	9
80,000,000	35,714	78,740	8
70,000,000	31,250	68,897	7
60,000,000	26,785	59,055	6
50,000,000	22,321	49,212	5
40,000,000	17,856	39,370	4
30,000,000	13,393	29,527	3
20,000,000	8,928	19,685	2
10,000,000	4,464	9,842	1
Pouds or Kins.	Pouds to Tons.	Kins to Tons.	
90,000,000	1,446,945	53,150	9
80,000,000	1,286,173	47,244	8
70,000,000	1,125,402	41,339	7
60,000,000	964,630	35,433	6
50,000,000	803,858	29,528	5
40,000,000	643,086	23,622	4
30,000,000	482,315	17,716	3
20,000,000	321,543	11,811	2
10,000,000	160,771	5,905	1

Millions	Hundreds of thousands	Tens of thousands	Thousands	Hundreds
*1	2	3	4	5

*Place decimal point before this number of figures from the end of the above results.

For example:

98,763,800 pounds or Kilograms.		654,250 Pouds or Kins.	
For Pounds.	For Kilograms.	For Pouds.	For Kins.
40.178	88,582	9,646.3	354.3
3,571.4	7,874	803.8	29.5
312.5	688.9	64.3	2.3
26.7	59	3.2	0.1
1.3	2.9	0.8	0.02
0.3	0.7		
44,090.2 tons	97,207.5 tons	10,518.4 tons	386.22 tons

Kilograms = 2.2 pounds. Pood = 36 pounds. Kin = 1.3.28 pounds.

(W. H. Rickinson & Son, London, England.)

UNITED STATES CRUDE RUBBER IMPORTS FOR 1920 (BY MONTHS).

1920.	Plantations.	Parás.	Africans.	Centrals.	Guayule.	Maniçoba and Matto Grosso.	Balata.	Miscellaneous Gum	Waste	Totals. 1920.	Totals. 1919.
January ... *tons*	17,799	2,620	821	111	...	....	....	....	.	21,351	7,235
February	29,681	2,456	558	265	34	....	..	. .		32,994	17,456
March	28,533	2,463	514	23	114	3	113	983	1,255	33,998	28,223
April	21,036	1,893	628	29	79	10	22	812	448	24,957	28,146
May	24,443	2,025	662	95	113	....	45	1,059	224	28,666	97,410
June	12,911	1,352	427	27	164	....	7	552	164	15,604	16,319
Totals	134,403	12,809	3,610	550	504	13	187	3,406	2,088	157,570	194,789

(Compiled by The Rubber Association of America, Inc.)

THE MARKET FOR RUBBER SCRAP.

NEW YORK.

There has been practically no business in the rubber scrap market during the past month. With the exception of a few sales of tires, and an occasional inquiry for boots and shoes, the market has been dead.

The present weakness is primarily due to the low price of crude rubber and the general lack of rubber manufacturers' interest in raw material at this time. There is no apparent reason to look for improvement until fall, when the rubber mills are expected to resume operations on full time.

The following prices are unchanged since a month ago, and are nominal quotations:

QUOTATIONS FOR CARLOAD LOTS DELIVERED.

July 26, 1920

Prices subject to change without notice.

BOOTS AND SHOES:				
Arctic tops	lb.	$0.01	@	
Boots and shoes	lb.	.07	@	.07¼
Trimmed arctics	lb.	.05¾	@	.06
Untrimmed arctics	lb.	.04¾	@	.05
HARD RUBBER:				
Battery jars, black compound	lb.	.01	@	.01¼
No. 1, bright fracture	lb.	.23	@	.24
INNER TUBES:				
No. 1	lb.	.15½	@	.16
Compounded	lb.	.09½	@	.09¾
Red	lb.	.08	@	.08½
MECHANICALS:				
Black scrap, mixed, No. 1	lb.	.03½	@	.04
No. 2	lb.	.02½	@	.02¾
Car springs	lb.	.03½	@	.04
Heels	lb.	.03	@	.03½
Horse-shoe pads	lb.	.03	@	.03½
Hose, air brake	lb.	.03½	@	.03¾
fire, cotton lined	lb.	.01½	@	.01¾
garden	lb.	.01½	@	.01¾
Insulated wire stripping, free from fiber	lb.	.03½	@	.04
Matting	lb.	.01¼	@	.01½
Red packing	lb.	.05½	@	.06
Red scrap, No. 1	lb.	.09	@	.10
No. 2	lb.	.06¾	@	.07¼
White scrap No. 2	lb.	.08	@	.09
No. 1	lb.	.10	@	.11
TIRES:				
PNEUMATIC—				
Auto peelings	lb.	.04¼	@	.04½
Bicycle	lb.	.02¾	@	.03
Standard white auto	lb.	.04¼	@	.04⅜
Standard auto	lb.	.03	@	.03¼
Stripped, unguaranteed	lb.	.02¼	@	.02½
White, G. & G., M. & W., and U. S.	lb.	.04¾	@	.05
SOLID—				
Carriage	lb.	.04	@	.04¼
Irony	lb.	.01	@	
Truck	lb.	.03½	@	.03¾

THE MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

American Cotton. New crop conditions continued to improve during the past month and the quotations for spot middling uplands steadily advanced from 38.75 cents on July 1 to 43.75 on July 24. Few sales were recorded, and the general market condition was quiet and steady with firm prices.

Sea Island Cotton. Holders of Sea Island cotton are aware of their strong position and believe that average extra choice is worth about $1.25. The small supply and high price of Sea Islands practically eliminates this material from the tire fabric situation.

Arizona Cotton. There has been no change in the market conditions of a month ago. Practically all the crop has been sold and the few bales remaining are worth about $1.20 for average extra.

Egyptian Cotton. The Egyptian market has shown some strength lately which does not seem warranted in view of the excellent new crop prospects. Cable advices state that this old crop is being manipulated by bull interests, and the demand is better than it has been for the last two months. High grade Sakel is quoted about $1.20; medium to low grades, $1.10 prompt shipment; medium grades of uppers can be bought around 70 cents.

Ducks and Drills. The market has been listless, the firmness of the cotton market acting as a brake on price declines of cotton goods.

Raincoat Fabrics. Conditions in the raincoat fabric trade are practically the same as last month. There is little or no buying and prices have not changed.

Sheeting. The market is very quiet with little or no buying of sheetings that are rather weak with many soft spots. The mills have caught up on orders and are anxious for business but the trade is not showing a disposition to buy. Improved business is not looked for until October 1.

Tire Fabrics. The demand for tire fabrics that has overtaxed the mills for many months has been somewhat relieved by the general slowing down of the tire manufacturing industry. Cord fabrics are in greater demand than building fabrics, due to the steady increase in cord tire manufacture. In fact, many mills are disposing of their heavy stocks of 17¼-ounce building fabric. Prices are slightly lower than last month and quotations are largely nominal.

NEW YORK QUOTATIONS.

July 26, 1920

Prices subject to change without notice.

ASBESTOS CLOTH:				
Brake lining, 2½ lbs. sq. yd., brass or copper insertion	lb.	$1.00	@	1.10
2¼ lbs. sq. yd., brass or copper insertion	lb.	1.10	@	1.15
BURLAPS:				
32—7-ounce	100 yards		@	
32—8-ounce			@	
40—7½-ounce		8.50	@	
40—8-ounce		8.75	@	
40—10-ounce		11.00	@	
40—10½-ounce		11.50	@	
45—7½-ounce		11.50	@	
45—8-ounce		11.50	@	
48—10-ounce			@	
DRILLS:				
38-inch 2.00-yard	yard	.42½	@	
40-inch 2.47-yard		.36⅛	@	
52-inch 1.90-yard		.52⅝	@	
52-inch 1.95-yard		.51⅜	@	
60-inch 1.52-yard		.65⅞	@	
DUCK:				
CARRIAGE CLOTH:				
38-inch 2.00-yard enameling duck	yard	.42½	@	
38-inch 1.74-yard		.48⅜	@	
72-inch 16.66-ounce		1.20	@	
72-inch 17.21-ounce		1.24	@	
MECHANICAL:				
Hose	pound	.78	@	.82
Belting		.78	@	.82
HOLLANDS, 40-INCH:				
Acme	yard		@	
Endurance			@	
Penn			@	
OSNABURGS:				
40-inch 2.35-yard	yard		@	
40-inch 2.48-yard			@	
37½-inch 2.42-yard			@	
RAINCOAT FABRICS:				
COTTON:				
Bombazine 64 x 60	yard	.30	@	
60 x 48		.27	@	
Cashmeres, cotton and wool, 36-inch, tan		1.00	@	
Twills 64 x 72		.46	@	
64 x 102		.48	@	
Twill, mercerized, 36-inch, blue and black		.57½	@	
tan and olive		.55	@	
Tweed		.80	@	1.40
printed		.27½	@	
Plaids 60 x 48		.28	@	
56 x 44		.27	@	
Repp		.40	@	.45
Prints 60 x 48		.29	@	
64 x 60		.32	@	
IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING—PLAIN AND FANCIES:				
63-inch, 3¼ to 7½ ounces	yard	1.45	@	3.90
36-inch, 2¾ to 5 ounces		.85	@	2.25

IMPORTED PLAID LINING (UNION AND COTTON):				
63-inch, 2 to 4 ounces	*yard*	$0.95	@	$1.90
36-inch, 2 to 4 ounces		.60	@	1.15
DOMESTIC WORSTED FABRICS:				
36-inch, 4½ to 8 ounces	*yard*	.85	@	1.90
DOMESTIC WOVEN AND PLAID LININGS (COTTON):				
36-inch, 3¼ to 5 ounces		.27	@	.35
SHEETINGS, 40-INCH:				
48 x 48, 2.35-yard	*yard*	.27½	@	
48 x 48, 2.50-yard		.28	@	
48 x 48, 2.70-yard			@	
48 x 48, 2.85-yard		.25¾	@	
64 x 68, 3.15-yard		.29½	@	
56 x 60, 3.60-yard		.25½	@	
48 x 44, 3.75-yard		.23	@	
SILKS:				
Canton, 38-inch	*yard*	.65	@	
Schappe, 36-inch		.85	@	
STOCKINETTES:				
SINGLE THREAD:				
3½ Peeler, carded	*pound*		@	
4½ Peeler, carded		*1.15	@	1.15¼
6½ Peeler, combed		*1.80	@	
DOUBLE THREAD:				
Zero Peeler, carded	*pound*	*.98	@	.98½
3½ Peeler, carded		*1.04	@	1.04½
6½ Peeler, combed		*2.70	@	2.70½
TIRE FABRICS:				
BUILDING:				
17¼-ounce Sakellarides, combed	*pound*	2.35	@	
17¼-ounce Egyptian, combed		2.15	@	
17¼-ounce Egyptian, carded		2.05	@	
17¼-ounce Peelers, combed		2.25	@	
17¼-ounce Peelers, carded		1.47	@	
CORD:				
15-ounce Egyptian	*pound*	2.40	@	
BICYCLE:				
8-ounce American	*pound*	1.50	@	
10-ounce American		1.48	@	
CHAFER:				
9¼-ounce Sea Island	*pound*		@	
9¼-ounce Egyptian, carded		1.29	@	
9¼-ounce Peeler, carded		1.71	@	

*Nominal.

EGYPTIAN COTTON CROP MOVEMENT.

From August 1, 1919, to May 5, 1920.

	1919-1920.	1918-1919.	1917-1918.
To Liverpool ... bales	244,774	191,214	159,125
Manchester	140,098	97,015	92,960
Other United Kingdom ports	145	5,537	138,276
Total shipments to Great Britain	385,017	293,766	390,361
To France	47,646	48,786	20,711
Spain	9,086	13,482	4,684
Italy	24,341	33,033	22,651
Belgium	680	......	....
Switzerland	12,894	20,379	3,350
Holland	875	......	....
Portugal	630	......	....
Germany	3,812	....	....
Austria	10,550	....	....
Greece	104	4,463	550
Turkey and other countries	98	....	....
Total shipments to Continent	110,710	120,143	51,946
To United States	274,847	50,210	56,763
Japan	16,161	11,517	12,464
Total shipments to all parts	**786,735**	**475,636**	**511,474**
Total crop (interior gross weight), cantars[1]		4,826,342	6,315,841

[1]One cantar equals 98 pounds.
(Compiled by Davis, Benachi & Co.)

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

NEW YORK.

There has been much less congestion in freight transportation conditions during the past month and the situation will doubtless continue to improve. In practically all lines manufacturers find it impossible to satisfy the demands of their customers, although they are making strenuous efforts to do so. Prices generally have remained firm with a tendency to recede slightly here and there.

Aniline Oil. Makers were behind in their deliveries early in the month with prices up to 35 cents. This was followed by a downward movement during the balance of the month till supplies were ample for the current demand and spot goods were selling at 32 to 33 cents.

Barytes. Producers of barytes are strenuously endeavoring to overtake the demand upon their facilities. There has been little change in price noted. Quotations have held steadily at $23.50 per ton with some tendency to rise.

Benzol. The supply has continued light. Manufacturers are behind and trying to catch up. The situation has led to changes in prices extending over the month from 23 cents to 35 cents for the pure grade and from 28 cents to 33 cents for the 90 per cent grade.

BLACKS. The market remains steady with prices unchanged.

CARBON-BISULPHIDE. Early in the month producers' stocks were cleaned out. Prices remained unchanged at 8½ cents under this condition.

CARBON-TETRACHLORIDE. The demand has held steady and fairly active. Prices have ranged from 10½ cents early in the month to 13 and 14 cents toward the latter part.

DRY COLORS. There has been a shortage of red oxides. The demand for dry colors in general has been steady, and prices unchanged.

LITHARGE. The situation is improving and the worst is said to be over as regards producing and shipping to meet the demand which continues to be very active. There will be no change in prices until a revision of the lead list takes place.

LITHOPONE. The old prices are announced to continue for the third quarter of the year. New plants and additions now under construction are rated to increase the lithopone output by 25,000 tons annually.

SUBLIMED LEAD. The demand for sublimed lead is active and deliveries are good with conditions of supply in eastern United States steadily improving. Prices hold at 10 to 10¼ cents.

SULPHUR. The market is steady and prices unchanged.

WHITING. The war-time situation has not yet been eliminated. Few, if any, receipts of chalk are coming in and the demand exceeds the supply.

ZINC OXIDE. All the plants are operating to capacity and extensions are being rushed. It is reported that in 1915 there were two producing companies in the United States with four plants; now there are 17 such companies with 23 plants. The chief demand is from the paint and rubber manufacturing industries, both of which are active.

NEW YORK QUOTATIONS.

JULY 26, 1920.

Prices subject to change without notice.

ACCELERATORS, ORGANIC.

Accelerene (New York)	lb.	$4.75 @	
Accelemal	lb.	.55 @	.57½
Aldehyde ammonia crystals	lb.	2.70 @	3.25
Aniline oil	lb.	.33 @	.34
Excellerex	lb.	.75 @	
Hexamethylene tetramine (powdered)	lb.	2.80 @	3.50
N. C. C.	lb.	.50 @	
No. 999	lb.	.20 @	
Paraphenylenediamine	lb.	2.70 @	2.85
Thiocarbanilide	lb.	.50 @	
Velosan	lb.	3.70 @	
Vul-Ko-Cene	lb.	.35 @	
Virol	lb.	1.60 @	

ACCELERATORS, INORGANIC.

Lead, dry red (bbls.)	lb.	.12¼ @	
sublimed blue (bbls.)	lb.	.10 @	
sublimed white (bbls.)	lb.	.10 @	
white, basic carbonate (bbls.)	lb.	.10½ @	
Lime, flour	lb.	.02½ @	
Litharge, domestic	lb.	.15 @	
imported	lb.	*.17 @	
sublimed	lb.	.12 @	
Magnesium, carbonate, light	lb.	.11½ @	.13
calcined extra light	lb.	.60 @	
calcined light	lb.	.35 @	
calcined medium light	lb.	.30 @	
calcined heavy	lb.	.07½ @	
calcined commercial (magnesite)	lb.	04 @	
oxide, extra light	lb.	67 @	
light technical	lb.	35 @	
light, imported	lb.	55 @	
imported	lb.	55 @	

ACIDS.

Acetic, 28 per cent (bbls.)	cwt.	3.75 @	4.50
glacial, 99 per cent (carboys)	cwt.	15.95 @	16.70
Cresylic (97% straw color) (drums)	gal.	1.20 @	1.30
(95% dark) (drums)	gal.	1.10 @	1.20
Muriatic, 20 degrees	cwt.	$2.25 @	$2.50
Nitric, 36 degrees	cwt.	6.50 @	7.00
Sulphuric, 66 degrees	ton	20.00 @	

ALKALIES.

Caustic soda, 76 per cent (bbls.)	lb.	.06¼ @	.07½
Soda ash (bbls.)	lb.	.05 @	

COLORS.

Black:

Bone, powdered	lb.	$0.06 @	
granulated	lb.	.11 @	
Carbon black (sacks, factory)	lb.	.15 @	.30
pressed	lb.	.22 @	
Drop	lb.	.05½ @	.15
Ivory black	lb.	.16 @	.30
Lampblack	lb.	.15 @	.45
Oil soluble aniline	lb.	1.00 @	
Rubber black	lb.	.09½ @	

Blue:

Cobalt	lb.	.25 @	.30
Prussian	lb.	1.00 @	
Ultramarine	lb.	18 @	.40
Rubber makers' blue	lb.	3.50 @	

Brown:

Iron oxide	lb.	.04 @	.04½
Sienna, Italian, raw and burnt	lb.	.06½ @	.13¼
Umber, Turkey, raw and burnt	lb.	.06¾ @	
Vandyke	lb.	.02½ @	.10

Green:

Chrome, light	lb.	.42 @	.70
medium	lb.	.42 @	.70
dark	lb.	.50 @	.70
commercial	lb.	.07 @	.15
Oxide I. R.	lb.	.75 @	
Oxide of chromium (casks)	lb.	1.25 @	
Rubber makers' green	lb.	3.50 @	

Red:

Antimony, crimson, sulphuret of (casks)	lb.	.45 @	
crimson, "Mephisto" (casks)	lb.	.60 @	
crimson, "R. M. P."	lb.	.67 @	
Antimony, golden sulphuret of (casks)	lb.	.20 @	.22
golden sulphuret (States)	lb.	.35 @	.40
golden, "Mephisto" (casks)	lb.	.33 @	
golden, "R. M. P."	lb.	.33 @	
red sulphuret (States)	lb.	.25 @	.30
vermilion sulphuret	lb.	.55 @	
Arsenic, red sulphide	lb.	.17 @	.18
Indian	lb.	.14 @	
Para toner	lb.	2.25 @	
Red excelsior	lb.	.19 @	.22
Toluidine toner	lb.	4.25 @	
Iron oxide, reduced grades	lb.	.15 @	
pure bright	lb.	.17 @	
Spanish bright	lb.	.05 @	.06
Venetian	lb.	.02½ @	.06½
Oil soluble aniline, red	lb.	1.75 @	2.00
orange	lb.	1.65 @	
Oximony	lb.	.18 @	
Vermilion, American	lb.	.25 @	.30
artificial	lb.	.37 @	
English quicksilver	lb.	1.65 @	
Rubber makers' red	lb.	3.50 @	4.00
purple	lb.	2.50 @	

White:

Aluminum bronze, extra brilliant		.65 @	
extra fine	lb.	.75 @	
Lithopone, domestic	lb.	.08 @	.08¼
Ponolith (carloads, factory)	lb.	@	
Rubber-makers' white	lb.	.11¼ @	
Zinc oxide, American (factory):		C. L.	L. C. L.
Special	lb.	.10¾ @	.11
XX red	lb.	.10¼ @	.10½
French process (factory):			
White seal	lb.	.13½ @	.13¾
Green seal	lb.	.12½ @	.12¾
Red seal	lb.	.11½ @	.11¾
Azo (factory):			
ZZZ (lead free)	lb.	.10 @	.10½
ZZ (under 5% leaded)	lb.	.09 @	.09½
Z (8-10% leaded)	lb.	.08¼ @	.08¾

Yellow:

Cadmium, sulphide, yellow, light, orange	lb.	1.50 @	1.65
red	lb.	1.85 @	
Chrome, light and medium	lb.	.35 @	
Ochre, domestic	lb.	.04 @	
imported	lb.	.04½ @	
Oil, soluble aniline	lb.	1.75 @	
Rubber makers' yellow	lb.	2.50 @	3.50
Zinc chromate	lb.	.54 @	

COMPOUNDING INGREDIENTS.

Aluminum flake (carload)	ton	30.00 @	
silicate	ton	35.00 @	
Ammonium carbonate (powdered)	lb.	17¾ @	
Asbestine (carloads)	ton	35.00 @	
Barium, carbonate, precipitated	ton	100.00 @	
sulphide, precipitated	lb.	.05 @	
dust	ton	110.00 @	

Barytes, pure white (f. o. b. works)	ton	$28.00	@
off color	ton	[illegible]	@
uniform floated	ton	[illegible]	@
Basofor	lb.	[illegible]	@
Blanc fixe	lb.	.05½	@
Bone ash	lb.	.10	@
Carrara filler	lb.	.02	@
Chalk, precipitated, extra light	lb.	.05	@ .05½
heavy	lb.	.04	@ .04½
[illegible]	ton	[illegible]	@
domestic	ton	[illegible]	@ 20.00
imported	ton	19.00	@ [illegible]
[illegible]	ton	20.00	@
Cotton linters, clean mill run, f. o. b. factory	lb.	.03	@ .04
[illegible]	ton	[illegible]	@
[illegible]	ton	[illegible]	@
Diatomite	lb.	.03	@ .04
Glue, high grade	lb.	.35	@ .45
medium	lb.	.30	@ .35
low grade	lb.	.20	@ .25
Graphite, flake (400-pound bbl.)	lb.	.10	@ .30
amorphous	lb.	.04	@ .08
Ground glass FF. (bbls.)	lb.	.03	@
[illegible]	ton	60.00	@
[illegible]	ton	[illegible]	@
Liquid rubber	lb.	.18	@
Mica, powdered	lb.	.13	@
Pumice stone, powdered (bbl.)	lb.	.05	@ .10
Rotten stone, powdered	lb.	.02½	@ .04½
Rubber paste	lb.	.19	@ .22
Rub-R-Glu	lb.		@
Silex (silica)	ton	25.00	@ 40.00
Soapstone, powdered gray (carload)	ton	12.00	@
Starch, powdered corn	cwt.	[illegible]	@
Talc, powdered soapstone	ton	20.00	@
Terra blanche	ton	25.00	@
Tripoli earth, air-floated, cream or rose	ton	50.00	@
white	ton	52.50	@
Tyre lith	ton	130.00	@
Whiting, Alba (carloads)	cwt.	1.00	@
Columbia	cwt.	.80	@
commercial	cwt.	1.40	@
English cliffstone	cwt.	2.00	@
gilders	cwt.	1.45	@ 1.55
Paris, white, American	cwt.	1.75	@
Quaker	ton	16.00	@
Super	ton	30.00	@ 32.50
Wood pulp, imported	lb.	.03¼	@
XXX	ton	75.00	@
X	ton	65.00	@
Wood flour, American	ton	50.00	@

MINERAL RUBBER.

Elateron (c. l. factory)	ton	60.00	@
(l. c. l. factory)	ton	63.00	@
Gilsonite	ton	75.00	@
Genasco (c. l. factory)	ton	67.50	@
(l. c. l. factory)	ton	69.50	@
Hard hydrocarbon	ton	42.00	@
K-X	ton	150.00	@
K. M. R.	ton	40.00	@ 65.00
M. R. X	ton		@
Pioneer (c. l. factory)	ton	60.00	@
(l. c. l. factory)	ton	65.00	@
Raven M. R	ton	50.00	@ 70.00
Refined Elaterite	ton	175.00	@
Richmond	ton	75.00	@
No. 64	ton	44.00	@
318/320 M. P. hydrocarbon	ton	50.00	@
Robertson, M. R. pulverized (c. l. factory)	ton	82.50	@
M. R. pulverized (l. c. l. factory)	ton	85.00	@
M. R. (c. l. factory)	ton	62.50	@
M. R. (l. c. l. factory)	ton	65.00	@
Rubrax (factory)	ton	55.00	@
Synpro, granulated	ton	85.00	@
Walpole rubber flux (factory)	lb.	.05	@

OILS.

Avoilas compound	lb.	.16	@ .18
Castor, No. 1, U. S. P.	lb.	.20	@
No. 3, U. S. P.	lb.	.19	@
Corn	lb.	.18	@
Corn, refined Argo	cwt.	18.06	@
Cotton	lb.	.17	@
Glycerine (98 per cent)	lb.	.23½	@ .24
Linseed, raw (carloads)	gal.	1.67	@
Linseed compound	gal.	.85	@
Palmoline	lb.	.15	@
Palm, special	lb.	$0.17	@
Peanut	lb.	.20	@
Petrolatum	lb.	.10	@
Petroleum grease	lb.	.07½	@ .09
Pine, steam distilled	gal.	2.10	@ 2.25
Rapeseed, refined	lb.	.22	@
blown	lb.	.22	@
Rosin	gal.	[illegible]	@
Synpro	gal.	[illegible]	@ [illegible]
Soya bean	lb.	.18	@
Tar	gal.	[illegible]	@ [illegible]

RESINS AND PITCHES.

Balsam, fir	gal.	[illegible]	@ [illegible]
Cantella gum	lb.	.55	@
Cumar resin, hard	lb.	.12	@ .16
soft	lb.	[illegible]	@ [illegible]
Tar, retort	bbl.	[illegible]	@
kiln	bbl.	[illegible]	@
Pitch, Burgundy	lb.	[illegible]	@
coal tar	lb.	[illegible]	@
pine tar	lb.	[illegible]	@
ponto	lb.	.14	@
Rosin	bbl.	16.95	@ 21.75
granulated	lb.		None
fused	lb.		None
Rosin, K	bbl.	19.25	@
strained	bbl.	[illegible]	@
Shellac, fine orange	lb.	[illegible]	@

SOLVENTS.

Acetone (98.99 per cent drums)	lb.	.26	@
methyl (drums)	gal.	1.50	@
Benzol (water white, 90%)	gal.	.33	@ .35½
Beta-naphthol	lb.	.89	@
Carbon bisulphide (drums)	lb.	.08½	@
tetrachloride (drums)	lb.	.12½	@ .14
Naphtha, motor gasoline (steel bbls.)	gal.	.32	@
73 @ 76 degrees (steel bbls.)	gal.	.40	@
70 @ 72 (steel bbls.)	gal.	.38	@
68 @ 70 degrees (steel bbls.)	gal.	.37	@
V. M. & P. (steel bbls.)	gal.	.29	@
Toluol, pure	gal.	.35	@ .40
Turpentine, spirits	gal.	1.80	@
wood	gal.	1.78	@
Osmaco reducer	gal.	.65	@
Xylol, pure	gal.	.60	@ .65
commercial	gal.	.35	@ .40

SUBSTITUTES

Black	lb.	.10	@ .21½
White	lb.	.11	@ .24
Brown	lb.	.15	@ .22
Brown factice	lb.	.10¾	@ .21¼
White factice	lb.	.12	@ .23
Paragol, soft and medium (carloads)	cwt.	18.58	@
hard	cwt.	18.08	@

VULCANIZING INGREDIENTS.

Lead, black hyposulphite (Black Hypo)	lb.	.39	@
Orange mineral, domestic	lb.	.15¼	@
Sulphur chloride (jugs)	lb.	.20	@
(drums)	lb.	.08	@
Sulphur, flour, Brooklyn brand (carloads)	cwt.	3.40	@
Bergenport (c. l. factory)	cwt.	3.65	@
Bergenport (l. c. l. factory)	cwt.	4.00	@ 4.25
superfine (carloads, factory)	cwt.	2.00	@ 2.25

(See also Colors—Antimony.)

WAXES.

Wax, beeswax, white	lb.	.68	@
ceresin white	lb.	.16	@ .20
carnauba	lb.	.45	@
ozokerite, black	lb.	.65	@
green	lb.	.65	@
Montan	lb.	.26	@
paraffine, refined 118/120 m. p. (cases)	lb.	.12	@
123/125 m. p. (cases)	lb.	.12½	@
128/130 m. p. (cases)	lb.	.14	@
Sweet wax	lb.	.14	@

PULMORE PULLEY TREAD.

Almost every user of belt driven machinery has experienced excessive belt slip or unusual wear due to a greater loading than that for which either the belt or pulleys were intended. There are various temporary remedies for these conditions, such as excessive belt tension or belt dressings. Two permanent cures for excessive slip are larger pulleys and belts, or a pulley having a friction surface equal to that of the belt.

Pulmore pulley tread is a chemically treated fibre compressed into sheet form and it is easily applied to any kind of pulley simply by soaking in water for a few seconds to loosen up the chemical compound. When dry, it sticks to the pulley face and gives it a frictional tread equivalent to leather. (Smith & Serrell, 90 West street, New York City.)

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC GUTTA-PERCHA

Vol. 62 AUGUST 1, 1920 No. 5

TABLE OF CONTENTS.

	Pages
Editorials:	
The Coming Rubber Shortage	707
No Profiteering in Rubber	707-708
Plantation Futures	708
Leather Rubber Footwear	708
Open Shop Cities	708
Minor Editorial	708
Experiments with a New Cactus Rubber. By Emmet S. Long—Illustrated	709-710
Old and New Methods in Cotton Warehousing Financing. By Richard Hoadley Tingley—Illustrated	710-712
September Meeting of the Rubber Division of the American Chemical Society	712
Tire Production in the United States ... Charts	713
Methods for Physical Testing of Vulcanized Rubber Goods ... Illustrated	715-719
Notes on Accelerators. By Henry P. Stevens, M.A., Ph.D., F.I.C.	719-720
The Manufacture of Battery Jars. ... Illustrated	721-722
Proposed Tentative Methods for Testing Textiles	723
Construction of Steam Hose ... By John M. Bierer	724-725
Specifications for Rubber Jar Rings	725
War Department Specifications for Rubber Combs. Illustrated	725
Rubber Armor for Airplane Gasoline Tanks. Illustrated	726
A Direct Method for the Determination of Rubber Hydrocarbon in Raw and Vulcanized Rubber. By W. K. Lewis and W. H. McAdams	727-728
£5,000 in Prizes for New Uses of Rubber	728-729
Peachey's New Vulcanization Process. By S. J. Peachey, M. Sc. Tech., F. I. C.	729
Chemistry:	
What the Rubber Chemists Are Doing ... Charts — The Acceleration of Vulcanization.	730-732
Chemical Patents	732-733
Laboratory Apparatus ... Illustrated	733
Machines and Appliances ... Illustrated — Automatic Cord Tire Building Machine. Rubber Buffing Machine. Improved Automatic Mill and Mixer. Combined Tire Building Machine and Loom. Machines for Varnishing and Vulcanizing Auto Top Fabric.	734-736
Machinery Patents ... Illustrated — Machine for Building Casings and Tubes. Other Machinery Patents.	735-736
Process Patents	736
New Goods and Specialties ... Illustrated — Late Automobile Fan Belt. The "Everloc" Household Patch. The "Big" and the "Little" in Motor Truck Tires. Goggles to Guard against Dust and Powders. A Meter to Measure Truck Loads. Rubber Bloomers for Children. "Super Patch Rubber-Tite" Tube Repair Outfit. "Wisco" Athletic Shoes. The "Locktite" Patcher. Hickory Garters for Children. Trouser Supporter Utilizes Rubber. The "Inkograph." Carpet Washer with Rubber Brushes. Repair Tool for Diverse Uses. The "Allweather" Automobile Top. Practical Automobile Accessories. Skooter on Rubber-Cushioned Trucks.	737-739
Editor's Book Table — "Exporter's Gazetteer of Foreign Markets."	740
New Trade Publications	740
Interesting Letters from Our Readers — From an Aged Father. A Defense of the Filipinos.	740
Inquiries and Trade Opportunities	741
The Rubber Association of America, Inc.:	
Summer Outing ... Illustrated	742-744
Activities of	744
American Rubber Trade—News Notes and Personals	745-758
Dividends	745
Financial Notes	745-746
New Incorporations	746-747
John Kearns ... Portrait and Sketch	747
Personal Mention	747
William E. Greer ... Portrait and Sketch	747
East and South ... By Our Correspondent	747-748
New Jersey ... By Our Correspondent	748-749
Rhode Island ... By Our Correspondent	749-750
Ellsworth E. Leach ... Portrait and Sketch	750
Massachusetts ... By Our Correspondent	750-751
Mid-West ... By Our Correspondent—Illustrated	751-752
Ohio ... By Our Correspondent—Illustrated	753-755
Curt Kuentzel ... Portrait and Sketch	756
Pacific Coast ... By Our Correspondent—Illustrated	756-758
Canadian Notes	758
The Obituary Record — Harry W. Du Puy (Portrait). Frederick Farley Cutler. Friedrich Bayer.	759
Foreign Rubber News:	
Great Britain ... By Our Correspondent	760-761
Germany ... By Our Correspondent	762-764
Foreign Notes	764
Planting:	
British Guiana and Trinidad. By Our Correspondent—Illustrated	765-766
Malayan Crude Rubber Industry in 1919. Edwin N. Gunsaulus	766
Rubber Industry in the Netherland East Indies. By Our Correspondent	767
Patents Relating to Rubber — United States. Canada. United Kingdom. France. Germany.	768-769
Trade-Marks — United States. United Kingdom. New Zealand.	769-770
Designs ... Illustrated — United States.	770
Markets:	
Crude Rubber	771
Highest and Lowest New York Prices	772
Amsterdam Rubber Market	772
Singapore Rubber Market	772
Reclaimed Rubber	771
Rubber Scrap	780
Cotton and Other Fabrics	780-781
Chemicals and Ingredients	781-783
Statistics:	
Antwerp Rubber Arrivals	774
Brazil, Exports and Imports of Crude and Manufactured Rubber, 1915-1919	775
Pará and Manáos Exports, May, 1920	775
Ceylon Rubber Imports and Exports	772
Cotton Statistics	781
Federated Malay States Rubber Exports	772
Java Rubber Exports	772
Penang Rubber Exports	772
Straits Settlements Rubber Exports	772
United Kingdom, Statistics for May, 1920	779
United States:	
Crude Rubber Arrivals at Atlantic and Pacific Ports as Stated by Ships' Manifests	771-773
Custom House Statistics	778-779
Imports by Months for 1920	779
Exports of India Rubber Manufactures during May, 1920 (By Countries)	776-777
United States Statistics for May	777

INDIA RUBBER WORLD

CAOUTCHOUC — HEVEA BRASILIENSIS — FOUNDED 1889 — DICHOPSIS GUTTA — GUTTA-PERCHA

Reg. U. S. Pat. Off. Reg. United Kingdom

Edited by HENRY C. PEARSON

Vol. LXII. No. 6 SEPTEMBER 1, 1920 35 CENTS $3.00 Per Year. $3.50 Abroad.

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC GUTTA-PERCHA

Reg. United States Pat. Off. Reg. United Kingdom.

Published on the 1st of each month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.
Telephone—Bryant 2576.
CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, F.R.G.S., Editor

Vol. 62 SEPTEMBER 1, 1920 No. 6

Subscription: $3.00 per year, $1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, $3.50 (or equivalent funds) per year, postpaid.

Advertising: Rates will be made known on application.

Remittances: Should always be made by bank draft. Post Office or Express money order on New York, payable to The India Rubber Publishing Company. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

Discontinuances: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

TABLE OF CONTENTS ON LAST PAGE OF READING.

ASSURING THE CRUDE RUBBER SUPPLY.

It has been well said that the nation which lacks vision must surely perish. With equal truth it may be said that no industry, however great, can afford to let success blind it to the need of looking well into the future and adequately planning to conserve the primary source of all its wealth, namely, that which yields its raw material and to which everything else must prove of secondary account.

The best informed are confident that the rubber industry will expand indefinitely and long be spared anything approximating a crisis; yet if its position is to be made impregnable, regard must be paid not merely to bettering its fiscal affairs, enhancing the efficiency of its workers, improving its processes, and increasing its output, but it must give greater attention than ever to the production of crude gum; not only by extending plantation areas, but also by taking every precaution to preclude the possibility of crop failure, a lessened yield, or latex quality deterioration, whether due to soil exhaustion, climatic changes, or plant diseases.

All this is but prefatory to hearty commendation of an appeal which is being made to rubber manufacturers throughout the world by the Imperial College of Science and Technology, South Kensington, London, for the support of the Botanical Section of its Department of Biology, and which appeal has recently received vigorous indorsement and substantial support from the Council of the Rubber Growers' Association of England, alined with which are the owners of the largest rubber plantations in the world. These far-sighted business men keenly realize how such an institution can carry on much better than any they might establish among themselves, exhaustive research in rubber plant diseases, bio-chemical problems in utilizing tropical flora, bacteriology of soil, plant breeding, and allied subjects of pressing concern to growers and consumers of tropical produce. The British Government contributes generously to the cost of this practical scientific work, but the expense of maintaining such research, keeping up great laboratories, and training numerous students willing to devote their lives to the betterment of the rubber industry quite overtaxes the resources of the famous college.

Apart from the fact that the question of improving rubber conditions at their source is of direct and pecuniary advantage to them, and that the college is ideally fitted for conducting research and worthy of most liberal encouragement, American manufacturers are in this instance afforded an opportunity to show their appreciation of unique and important consideration. Not only are they mindful of the valuable pioneer work of English rubber planters, and well do they realize that this country is greatly dependent upon English enterprise for its supply of raw rubber, and that in aiding the college named and cooperating with the rubber growers overseas they are but helping American industry, but they also do not forget that during the Great War, when production in this country in so many other lines was halted or retarded through inability to import raw material, the rubber manufacturers of the United States knew no shortage of material, having been directly favored with an abundant, unfailing supply of crude gum sold to them at the low, pre-war prices, even though the cost of everything else was sky-rocketing.

NO SLUMP IN SIGHT.

The midsummer dullness, with its vacations, a few shut downs and a certain slackening in orders, in the light of the needs of the country does not for a moment argue a general depression in the rubber business. As the Goodrich company points out, the automobile and motor truck business is due to continue its demand for tires and that in increasing proportions. So, too, the United States Rubber Co. predicts a footwear business for next year fully 40 per cent greater than that of the present year. In addition to this is the

vast new railway equipment needed for railroads in all of which the mechanical goods companies share. Truly, instead of gloom, the prevalent attitude in rubber should be most optimistic.

PROFIT-SHARING, PIECE WORK AND BONUSES.

Harassed with pleas for higher wages and shorter working time, and menaced with direct or covert threats of strikes, many a rubber concern, operating perhaps on a narrow margin of profit and against keen competition, is often sorely puzzled as to how best to placate discontented operatives. To raise the wage scale without being able to increase the selling price of the products, much less to reduce the working time while advancing the fixed pay, may mean flirting with failure. Finally, to the distracted concern casting about for a solution for the vexing problem the profit-sharing plan is suggested as a "happy compromise"; and the managers, like the drowning man who clutches even at a straw, seize upon the plan. If it be accepted by the employes the managers flatter themselves on their good fortune in thus composing the disgruntled and averting an impending disaster. Yet what they really do is to administer to themselves and their employes a Lethean draught to make them for the time being forget their mutual troubles, while blindly trusting to the morrow to supply the deficiencies of the present day.

Because in some favorable instances the profit-sharing scheme has been a success, that does not alter the fact that it is unscientific and cannot be applied efficiently in a wide variety of cases. For a concern to virtually agree not only to maintain a certain scale of wages, but also to distribute regularly a generous share of profits to its employes, means assuming an obligation that is often very difficult to discharge. Unforeseen circumstances may make such profit smaller than the employes had been led to expect, or it may disappear altogether, arousing suspicion and ill-feeling among the workers. Setbacks come to even well-directed concerns; and statistics remind us that but one out of five business ventures proves a money-making enterprise. Hence, when the share of profit fails to materialize it may be hard to convince the disappointed workers that they have not been tricked. Stockholders, accustomed to business reverses, may resign themselves meekly to the passing or reduction of a dividend; but impractical employes, who waived their demand for more pay and accepted the will-o'-the-wisp of profit-sharing, may angrily renew their claims, and the last state of the temporizing employer may be worse than the first.

Even though some profits be declared, the ardor of the zealous, ambitious worker is sooner or later chilled by the indifference of the lazy or incompetent worker who shares equally in the awards, and he either lapses into the humdrum of mediocrity or goes elsewhere to better himself. While the wage system will linger long with us, and while in some forms of employment it is neither feasible nor desirable to supplant it with any other form of compensation, yet for a great many industries a much more elastic system has been found advisable to add zest to work. Such procedure is to pay men for what they actually do in quantity and quality, and not a portion of profits that some one else may have won for them through good fortune or through rare managerial skill. A close approximation to this is seen in the piece-work system that obtains in some of the largest rubber factories in the country, and which mode of rewarding industry provides an unfailing incentive to speed up and increase production, while tending to disarm distrust and lessen friction between employer and employed.

The second largest steel producing concern in America, employing over 100,000 men, rejected the profit-sharing system as too vague and uncertain and installed the wage and premium plan instead with striking success. Not only are the workers assured of a fixed daily allowance, but they also receive a bonus for everything done beyond a specific minimum amount. No man is too high or too low to benefit by this plan; and even where a relatively small amount of manual labor enters into a task, a man gets extra compensation for what he saves in fuel or other commodities, or for devising time- and labor-saving processes. It means maintaining a very complete cost system, but the investment yields a good return. Best of all, it pleases the worker to be paid fairly and quickly for personal, individual service, and for every extra effort he puts forth, instead of having to wait a long time for possible "profits." Perhaps this is the reason why this concern did not have to close its mills for even a day during the big steel-workers' strike last fall.

HAS THE FIBER SOLE ENEMIES?

There is no question that the rubber fiber sole found many friends among the wearers of medium priced shoes. This for the very good reason that it outwore two or three leather soles. Complaint is beginning to be heard that it is not so easily obtainable as it was in the past, that retailers and repair men often do not now stock it. One suggested reason is that repairers do not desire their work to last too long. Another is that the leather sole men are quietly fighting the fiber sole as jeopardizing their business. It is probable that neither of these conditions prevails to any great extent. Furthermore, were such conditions prevalent, they would be, if merely taken advantage of, an ideal background for a big drive in fiber soles.

Possibilities of the Peachey Process.

In considering an invention that appears to be revolutionary it is interesting and always well to know the source. The inventor of the Peachey process, S. J. Peachey, is a well-known English chemist, who since 1902 has been lecturer in chemistry in the Manchester College of Technology and lecturer also in the faculty of technology of the University. For many years he has devoted much attention to rubber, has produced a number of valuable compounds and has done much toward the development of accelerators.

BRIEF OF THE PROCESS AND GASES.

The process, briefly, is the exposure of rubber compounded or pure in sheet form without sulphur, exposed first to sulphur dioxide gas, followed by exposure to hydrogen sulphide gas, all without heat; or saturation of rubber solution with the same gases. Sulphur dioxide, one of several oxides of sulphur, is a colorless gas resulting from the burning of sulphur. It was first obtained in the pure state and recognized by Priestley in 1775. It occurs in nature in the gas issuing from volcanoes and in solution in waters of some springs. Enormous quantities of sulphur dioxide are used in the manufacture of sulphuric acid by the combustion of sulphur or a metallic sulphide.

Sulphur dioxide is colorless and has the peculiar irritating odor observed when sulphur is burned. It is 2.2 times heavier than air and under standard conditions one volume of water dissolves about 80 volumes of the gas. It is easily liquefied, a freezing mixture of ice and salt being sufficient to effect condensation under atmospheric pressure. The resulting liquid is colorless and is a commercial product, being stored in strong glass syphon bottles or metal containers.

Hydrogen sulphide is a colorless gas of very offensive odor, familiar as the odor of rotten eggs. It is 1.18 times as heavy as air and may be readily condensed to a colorless liquid. One volume of water at ordinary temperature dissolves three volumes of the gas, which may be expelled completely by boiling. In pure form the gas acts as a violent poison and even when diluted largely with air produces headache, dizziness and nausea. Fortunately its extremely disagreeable odor gives warning of its presence. It is not an article of commerce but may readily be prepared by the action of hydrochloric acid on iron sulphide and may be stored in glass or metal containers.

PRECURSOR OF VULCANIZATION IMPROVEMENT.

No doubt the Peachey process is of value, of great value, but it is probably not the last word in this line of vulcanization. Just as aniline came into use as an accelerator and was later dispossessed by other better catalyzers, so will the dual gases be superseded by compounds, liquid, solid and gaseous, that will produce vulcanization within the rubber compound and be so graded and governed that exact time limits and varying results be accurately obtained. This is assured by the general interest in this line of work and the searching experiments that have long been carried on in many of the great rubber laboratories.

That curing by quick and high heats is often a detriment is freely conceded. Fabrics are certainly not improved; indeed certain of them are weakened. Animal substances like leather are burned unless specially prepared to withstand the heat and even then suffer a loss of original strength. Where the Peachey process is adaptable, therefore, fabrics and strengtheners of all sorts may be expected to preserve their original integrity.

The possibility of getting rid of chloride of sulphur and bisulphide of carbon will appeal to those who use the cold cure. To be sure, through modern safeguards the ill effects of both the solvent and curative agent are guarded against, but neither are pleasant ingredients either in store or in use.

Of the claims to superiority in result some attract instant attention and some do not. The claim that porosity will be much lessened is doubtless sound, but with a very definite knowledge of the cause of porosity, both chemical and mechanical, the evil is rarely present. Anti-porous ingredients and the pressure cure make gas bubbles almost an impossibility even in the greenest of stocks.

ON THE RELATIVE IMPORTANCE OF COLORS.

The importance of color or shades of color in soft rubber goods is generally overestimated. In ninety-eight per cent of the manufactured product it is of absolutely no importance. A very little reflection will make it evident that pink belting, robin's-egg blue wire covering, old-rose valves, or Titian truck tires would be of no interest to users. Not only is this true in mechanical lines, but in footwear and clothing as well, where the bulk of the product will always be black by preference. Furthermore, in all of the important lines where reds, tans, blues or whites are demanded they are successfully produced at reasonable cost. In druggists' sundries and notions, as bathing caps, color, however, is of value. Ten years ago the announcement that any desired shade could be obtained in rubber would have interested manufacturers exceedingly. Today, however, so great a variety of colored compounds is produced that the actual necessity does not exist. This does not mean that other shades would not be used if available, but the void of past years no longer exists.

However, in light rubber surfaced clothing, particularly for ladies' wear, there seems to be a considerable field. In the past some beautiful effects in color have been obtained, but with difficulty. Peachey's process, however, would seem to open the door to the production of a great variety of colors, shades and effects rivaling the finest fabrics, and such as would appeal irresistibly to the decorative sex.

In toy balls also, solid colors in cheap compounds would obviate the necessity of painting the surfaces. It is quite probable further that balloon fabrics colored to resist the effect of sunlight might be more effective than under existing methods.

In the cases of dipped goods and spreader goods when cured by acid or vapor, manufacturers may and doubtless will find in the new process a surer way of securing a greater variety of colors than at present and it is in those lines that a considerable development is probable.

An advantage would seem to lie in the complete vulcanization that the process insures, something that neither the hot process nor the sulphur chloride cure accomplishes. Another is the freedom from efflorescence of sulphur (bloom) on the surface of finished goods.

CURING METHODS CONJECTURED.

Just how one would cure rubber goods by the Peachey process is a very interesting subject upon which to speculate. In spreader work, for example, the gas impregnated compound would be applied as usual. The first coat as soon as the solvent was evaporated would, unless we err, at once cure itself. The second coat would therefore be spread upon a coating already vulcanized. Not that this would matter probably, but it is a bit startling. Or the goods could be spread with the ordinary compound minus the sulphur and exposed to the action of the gases in an ordinary dry heater,

without the heat, however. This naturally brings up the question as to whether all dry heat goods can be thus treated, carriage cloth, clothing, blankets and the like, and the answer sounds like yes.

Still considering dry heat processes, may boots and shoes be thus cured? Granting that the new process brings about a very dense condition in the finished product, is the result likely to be as good as that obtained by the pressure cure now generally used in footwear manufacture? If so, are the big old-time dry heaters, minus their heating equipment, likely to come into vogue again? The question of finish, of course, will be important. Footwear is a varnished product and it is likely that a coating of boiled oil varnish on the outside of a shoe would keep the sulphur gases out. That, however, is not important, as a Peachey process varnish could doubtless be added that would be more elastic and brilliant than one made of linseed oil.

TOUCHING NEW COMPOUNDING INGREDIENTS.

It is in the line of new applications of rubber and its wider use of new compounding ingredients, however, that one is minded to investigate.

The fact that the process is one that is free from the destructive influence of heat opens up many new compounding possibilities. Organic substances have been used with difficulty in rubber compounding in the past. Today, glue is about the only one that is largely used, and that took much careful experimentation before it was a success. The right kind of cold process, however, would admit the use of almost any kind of gelatin, animal or vegetable, of which the seaweed gelatines are the most interesting. There is also the possibility of the incorporation of such animal products as dried milk and casein. Indeed the utilization of almost any kind of dried animal refuse would seem to be feasible. Although the gases in themselves are not particularly pleasant, the process would seem to admit of the use of a great variety of essential oils and perfumes that would not only do away with the smell of the vulcanizing ingredients but would impart a pleasant odor heretofore difficult to obtain in manufactured rubber goods. As a case in point, Chinese rubber shoes with a distinct odor of sandal wood would doubtless find a ready market in the Flowery Kingdom.

ON THE USE OF VARIOUS PRODUCTS.

There is also an opening for the utilization of a variety of vegetable fibers not heretofore used because injured by heat. Thus there would be nothing to prevent the use of wool shoddy, bristles, horsehair or cowhair.

Speaking of vegetable products, the flours of rice, barley, rye, oats and wheat, once the prices come down, might make good compounds. Indeed a very little of the cold process rubber added to the macaroni compound would produce white tubing comparable to some of that which today appears in the open market.

The inventor has already mentioned the field now occupied by the products known as linoleums. There is no doubt that rubber as a binding material is infinitely superior to oxidized linseed oil. If in addition it is self-vulcanizing, the product that should be produced would be much more durable and at much less cost. Furthermore, the same conditions should apply to table and shelf oilcloth.

It is in the line of repairs, particularly in rubber factories, that some such process should have its first development. In spite of constant inspection, goods that are defective are often scrapped. This is largely because they will not stand revulcanization without burning. A filler that will thoroughly vulcanize applied to a damaged section would, therefore, be of the greatest value. So too in the line of general repairs of all sorts. Such a jelly would find a very general use.

RUBBER GLUE POSSIBLE.

It is a well-known fact that the leather shoe manufacturers are very large users of rubber cements. These cements are used more for their waterproofing qualities than for holding. A channel cement that would be self-vulcanizing and thus add to the strength of the shoe would be a step in advance.

The glues, animal and fish, have long been in a class by themselves as adhesives and for sizing. A rubber cement that is self-vulcanizing is likely to find a field that will seriously crowd glue. In holding veneers, in book-binding, in many lines where waterproof qualities and a degree of elasticity are of value, rubber glue should be far superior to the organic product.

POSSIBILITIES OF COLD PROCESS HARD RUBBER.

There is no suggestion that the Peachey process produces hard rubber. On the other hand, with the investigations and experiments that are toward a self-vulcanizing compound that turns itself into ebonite will one day appear. When it does it will occupy a large part of the field now held by such products as celluloid and galalith. Accustomed as we are to only two or three colors in vulcanite, it is difficult to appreciate the tremendous field for hard rubber goods once they can be made in all colors and shades without overloading with detrimental pigments. Sufficient to say that a cold process like Peachey's applied successfully to hard rubber would produce ornaments in jade, amber, tortoise shell and the like, infinitely superior to any celluloid or casein products. While in lacquers, elastic varnishes and japan, rubber would have the field all to itself.

The possibility of a pure white hard or semi-hard rubber leads the thought at once to pottery. The fragile plates, cups and saucers are a constant source of trouble and expense, particularly in hotels and on shipboard. The cost of breakage alone is very great. A semi-hard white, odorless and strong dish would be a boon and it is not an impossibility.

We are minded here to speak again of hard rubber wood, the production of which would be immensely hastened by cold process vulcanization. Hard rubber wood is coming anyway and fortunately is not dependent on revolutionary processes.

Vulcanized fiber is a product that is very important in the arts, large factories being employed in producing it. The one troublesome quality of the material is that it absorbs moisture. To counteract this it is shellacked and surface treated. An analogous product containing a very little self-vulcanizing rubber would doubtless drive the old time fiber out of this market.

SUGGESTS RUBBER IN PAPER MAKING.

Rubber has in times past been tried in paper manufacture. Its high cost and the necessity for hot vulcanization rendered it of no value, however. Today, with cheap rubber and a cold process that does not injure fiber nor discolor, there are possibilities of rubber as a pulp binder finding a new and wider field of usefulness. It is likely also that many fibers heretofore useless might become valuable. Paper makers say that paper that crackles is not looked upon with favor and is unsalable. Possibly a little rubber in the harsh pulp might correct this evil. However this may be, a certain amount of rubber would greatly strengthen any paper; a sufficient portion would render it not only tough, but waterproof as well. And this applies not only to book and wrapping papers, but to wall papers and tapestries.

Furthermore, paper boxes, bottles, containers and cartons, cigar boxes, paper plates and scores of other paper products are likely to be made more sanitary and useful by this binder. It is also entirely possible that the Peachey process may be the necessary touch to make German paper clothing a success. Even today hundreds of Englishmen are wearing

German paper suits. The suits wear about a week. A rubber binder that in no way affects the color, that makes the product practically waterproof and more flexible, may bring the product into permanent competition with cotton, wool and silk wearing apparel. And speaking of silk, is not this addition just what is needed to bring artificial silk a bit closer in lasting quality to nature's product?

IMPROVED RUBBER THREAD.

Among the lines of manufacture that suggest themselves as being revolutionized by this or an analogous process one might cite rubber thread. This product as made today shows a square end in cross-section. A stretched rubber thread when it begins to give away shows a multitude of tears along the sharp edges. A round thread would not be open to this objection. Harking back to the beginnings of rubber thread, it was once made round by forcing rubber in solution through metal dies. Had the rubber dough been self-vulcanizing it is doubtful if the square thread ever would have appeared.

THE QUESTION OF MASS VULCANIZATION.

The possibility of making molded goods by this process is already engaging considerable attention. For these articles molds or forms of almost any material could be used, plaster of Paris, for example. It is likely that molds of porous material might find use. These have already been suggested by the inventor. For thick articles, however, they would hardly do. The reason is that in the vulcanization by mass there must be opportunity for the liquids to escape. It would be much like coagulation of rubber latex. If done in mass, water is imprisoned and unless sheeted it is held in the interior. In the same way a mass of rubber vulcanized by the Peachey process would inevitably contain water, and if solvent was used, much of it would be imprisoned. As to porous molds carrying this off, when earthen plates were tried for coagulating latex only the surface moisture was absorbed.

The statement is made that buffers (springs) may be made in layers, each vulcanizing itself in turn, adhesion between the layers being obtained by Peachey process cement. This is possible, and it is also possible that solid tires may be made by a similar building up process.

THE UNKNOWN EFFECT ON RECLAIMS.

A question of considerable moment upon which no light is yet thrown, is the behavior of the new process toward reclaimed rubber. So far no one seems to know just what results will be obtained, particularly in the medium and lower grades of reclaim. As fully as many pounds of recovered rubber are used as of crude, it is naturally one of the first of the queries that manufacturers put.

RUBBER MEN WILL DISCUSS SAFETY PROBLEMS.

The Rubber Section of the National Safety Council will consider safety problems of especial interest to the industry at a section conference to be held September 29 to October 1, in connection with the national session of the Council to be held at Chicago.

Among the topics for discussion will be: "The Present and Future of Safety in the Rubber Industry," chairman, S. M. Schott, United States Tire Co.; "Health Hazards," J. H. Horan, Hood Rubber Co.; "Making Mills and Calenders Safe," C. B. Mutchella, The B. F. Goodrich Co.; "Handling Materials," F. B. Martens, Firestone Tire & Rubber Co.; "Vulcanizing Apparatus," F. Scott, Hamlin & Co.; "Industrial Sanitation," W. N. Fitch, The B. F. Goodrich Co.; and "Teaching Safety in the Factories," H. T. Martin, The Fisk Rubber Co. An address will be made by J. N. Gunn, president of the United States Tire Co., on the opening day of the section meeting, and by A. A. Frank, factory manager of the Federal Rubber Co., on the last day.

EXPORTS OF INDIA RUBBER MANUFACTURES FROM THE UNITED STATES DURING THE CALENDAR YEAR 1919.

The announcement of the United States Government that henceforth all tables of import and export statistics shall be for the calendar instead of the fiscal year ending June 30 as heretofore seems to be a step in the right direction. At any rate, it greatly clarifies such tables and permits a much simpler analysis and comparison for the layman, to whom "double-barrelled" year numerals like 1916-17 or 1917-18 were often a source of confusion.

Of much interest is the recently published table of exports of india rubber manufactures from the United States during the calendar year 1919, printed elsewhere in this issue. The total value, $53,865,655, as against $31,501,292 in the calendar year 1918 is proof positive to the rubber manufacturer that business is "picking up." Any business that nearly doubles itself in the space of a year is a good one to be engaged in. A comparison of the 1919 figures with the small export of $12,441,220 during the year before the war (1913-1914) shows the progress made by the rubber industry of the United States in foreign markets.

By countries the report is just as encouraging. The exports of automobile tires rose to $28,924,659 (more than half of the total rubber exports, by the way) as against $14,511,621 for the calendar year 1918. Of these, $11,907,480 went to Europe; $2,970,464 to Asia; $4,986,024 to our neighbor South America; $3,872,374 to Oceania and Africa; while $5,188,317 stayed near home, being exported to other places in North America. Cuba took $2,013,071, while Canada called for $1,021,014. Of tire exports to South America Argentina leads with $1,788,147, with Brazil second at $1,018,055. France took nearly a third of the tire exports to Europe, $3,535,178; England bought $1,508,460; Sweden, $1,373,847, and Denmark, $1,254,324, with the Netherlands not far behind at $1,043,981.

Exports of tires to the Philippines totaled $1,372,544, while New Zealand took $1,023,807. The largest consumer of American tires in Asia during 1919 was the Dutch East Indies with $686,873, while British South Africa led that continent with $479,934.

The rubber shoe export rose from $1,584,747 in the calendar year 1918 to $4,551,386 in 1919, while rubber boots showed a decided fall—from $2,799,116 in 1918 to $714,713 in 1919. This is explained by the large exports to Europe where boots were needed during the war, while shoes are now in demand.

Exports of belting, hose and packing showed a considerable increase from the previous year, the amount in 1919 being $6,100,460 as against $4,525,243 in 1918.

Druggists' rubber sundries, which were not specifically reported before 1917-18, showed a gratifying increase; while in 1918 the figures were $772,539, the amount nearly doubled the following year, being $1,270,506 for the calendar year 1919.

Rubber scrap exportations increased very largely over the preceding year, the figures being $808,993 in 1919 and $287,883 in 1918. Reclaimed rubber also showed an increase, from $502,176 in 1918 to $839,938 in 1919.

COLLAPSIBLE PLAYING BALL.

A collapsible playing ball is a novelty on the market. Made entirely of cemented rubber, it may be inflated by blowing through the specially constructed aortic valve. As soon as the action ceases, the pressure inside causes a perfect automatic closure of the valve. When the player has finished, he inserts a rod or pencil, thus opening the valve and allowing the air to rush out. The empty ball may then be folded in any suitable manner, and carried without being in the way. (French patent No. 138,306. Boguier & Burnet, 21-23 rue des Filles du Calvaire, Paris.)

Tire Bead Manufacture.

By Robert C. Kelley, A. B.

It is an old axiom among rubber men that their merchandise is only as good as its weakest part; thus, the tiny pinhole makes the whole inner tube useless, and the started sole makes the rubber shoe a second. This is particularly true of the automobile tire—a tough tread with a good non-skid design, the best Sea Island cotton frictioned with 95 per cent Pará, and a strong side wall will not give the mileage if the bead construction is faulty.

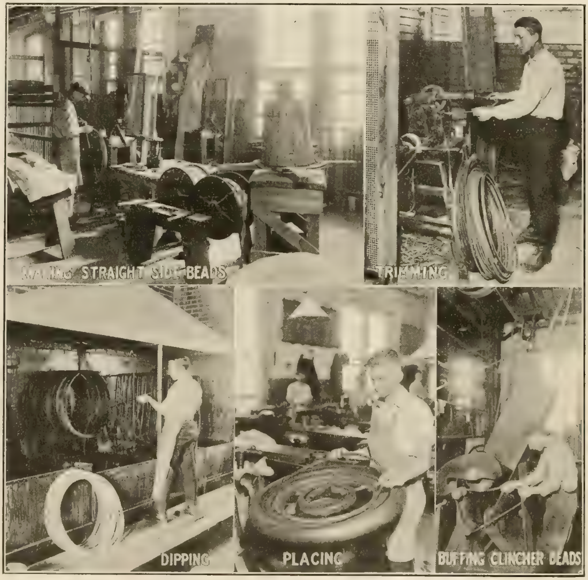
Bead making, while not involving any complicated processes or highly skilled workmanship, is nevertheless of enough importance to warrant a separate department for this work. Beads are divided into two classes, the straight-side bead and the clincher bead for demountable rims.

MAKING STRAIGHT-SIDE BEADS.

The straight-side bead is built up on a wheel the size of the tire, as here illustrated. This makes it necessary to have as part of the equipment a wheel which can be used interchangeably on the bead making machine for each size of tire. This wheel has the outer edge raised, forming a groove in which the bead is constructed in the following manner: first, a strip of frictioned cloth about two or three inches wide, cut on the bias, is laid in the groove and stitched down with a plain hand stitcher or revolving wheel. Then several coats of cement are applied with a brush, and the strands of wire placed in the strip, twice around the wheel. On top of this as a covering are laid two plies of bead cord which comes in strips similar to cord fabric only of smaller staple cotton. The parts are then rolled together firmly by pressure of a hand roller on the revolving wheel.

The final operation before curing is to fold over the plies of fabric, completely covering the wire which is embedded in the center of the fabric. Great care must be taken to see that the wire is covered at all points, otherwise it will break through in the cure and spoil the bead. Spoiled or damaged beads are a total loss, as their hard, brittle texture and the presence of the wire make them valueless for reclaiming purposes. In tire reclaiming one of the first operations is to cut out the bead.

The bead is cured in a circular mold in a hydraulic press for about seven to ten minutes and comes out in the form of a hoop. The overflow is trimmed off on a trimming machine, shown in the picture, and the beads are then inspected for breaks and defects due to faulty stock, poor making, curing, or trimming. Before passing to the tire maker the beads are dipped in a vat of specially prepared cement and hung on racks to dry, as here illustrated. This is to give the bead plenty of adhesion so that it will stick well to the plies of fabric which encompass it in the tire.



Bead Making Is of Sufficient Importance to Require a Separate Department.

The bead now passes to the tire maker and is built into the tire as follows: the maker first places the iron core on his machine and starts the first ply of building fabric on the core in such a manner that it entirely covers it, the center line of ply following the center line of the core, allowing it to overlap the core evenly on both sides and applied with equal tension. He next manipulates the two mechanical stitchers, bending the plies into the under side of the core, forming ears in which the bead is placed within iron rings, which are held in place by clamps. The picture shows a tire-maker placing the bead for a straight-side tire. The bead in position, the rings are removed and the bead thoroughly stitched down to secure proper and uniform adhesion. The bead is covered by a piece of friction known as the bead ply or reinforcement and encompassed by additional plies of fabric.

MAKING CLINCHER BEADS.

The clincher bead differs from the straight-side bead in that it has a core of hard rubber instead of wire and is more nearly circular in shape, whereas the straight-side bead is like a triangle with sharp edges. This core is mixed and compounded with a high percentage of sulphur to make it vulcanize hard.

The stock is warmed up and run either on an outsole calender with a roll specially engraved for this purpose or on a tubing machine. These long strips of uncured bead gum

are first covered with a strip of friction, or, if uncovered, are buffed on a wire wheel to smooth off the rough edges, and placed in a spiral vulcanizing mold which is washed with liquid soap to prevent sticking to the mold. The cure varies from seven to ten minutes. The long strip is then removed from the mold and cut into lengths to make the size of bead desired. This must be carefully planned out before the beading is cured to avoid the waste of trimming, as the uncured trimmings can be used over again, whereas the cured ends have little scrap value. The ends of the bead are joined by splicing. This is done either in the bead department or by the tire-maker.

A clincher bead being buffed is shown herewith. Clincher beads are more flexible than straight-side beads, although they harden up in the second cure with the tire. The difference between the two types is seen in the illustration, where straight-side beads are hanging on the left-hand racks and clincher beads on the right, after dipping.

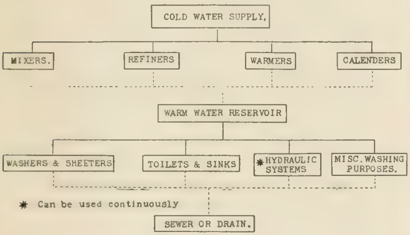
While methods differ in various plants, this article describes the processes of bead making generally followed in the tire industry today.

WATER REQUIREMENTS FOR RUBBER MILLS.

By Walter J. Bitterlich.

In the manufacture of rubber products, temperatures are of prime importance. Rapid changes as well as uniform and even temperatures are required and obtained largely by the use of water, steam, and air. Uniform temperatures cannot be maintained with water, or air unless they are circulated. This is apparent while in bathing, when different currents are met with, some cold and some warm; also in a bath tub when the water is too cold and hot water is added, it is necessary to stir it up in order to make it uniform.

Owing to the tremendous amount of water used, economy is practiced by its reuse and the equipment requiring cold and warm water should be laid out, graphically, as follows:



Graph Showing Water Installation for Mills and Calenders.

The above illustration shows how water economy can be accomplished, but no attempt has been made to show pumping arrangement because each plant has different conditions and the system should be designed for the conditions as they exist.

The amount of water used daily in rubber plants varies from 100,000 to 3,000,000 gallons per day, depending on the capacity of the mill. When water rates are low, its reuse is not always worth the investment in pumping and pressure tank equipment, but where water costs from 75 cents to $1 per 1,000 cubic feet, the investment is saved in a very short time. If artesian wells are not available with cold water below 60 degrees F., the municipal supply is used, and this varies in the summer months from 70 degrees to 75 degrees F. Then it is necessary to increase the velocity of the water to obtain quick changes in temperatures of mill and calender rolls, and consequently more water is used. Its reuse in this event should be given consideration, otherwise the water bill will be high.

In laying out the local water and steam supply for both the mills and calenders, the returns should always flow by gravity and not discharge up to the ceiling of the room. The reason for the former is because a roll will never be more than half full of water after the valve is closed and when a quick change to warm up the roll is necessary, only a half roll of water will have to be discharged, whereas, if return is up, a full roll will have to be discharged and double the amount of steam will be required to accomplish it.

Not only is there economy in gravity flow but more important is the uniform temperature that can be maintained on the surface of the calender or mill roll because when the roll has become hot and is full of water it is desired to cool it during shutdown by circulating cold water, the upper half of the roll will be warm and the lower half cold. This is because the cooling water entering and returning through the pipe in the center of the roll short circuits and the hot water remains at the top of the roll.

A method of conserving the water supply in mills, which, by the way, use the greatest amount, is to install an open funnel at the return pipe of the mill roll. It will show at a glance the amount of water flowing through the roll, and if one mill is using more than another, it may be seen by the foreman who can order the valve regulated for its economical use. Of course, some stocks require lower roll temperatures and consequently more water, but the foreman should know this and be able to save much water.

WESTERN SALES MANAGER, C. KENYON CO., INC.

Osborne Smith Tweedy, who has been appointed western sales manager for the C. Kenyon Co., Inc., Brooklyn, New York, with headquarters at 223 West Jackson boulevard, Chicago, Illinois, was born in Buffalo, New York, in 1872.

O. S. Tweedy.

Following his education in the grammar and high schools of that city he started in business in 1896 with the Eagle Iron Works. In 1888 he was appointed Buffalo branch manager for the Revere Rubber Co., following which he joined the Diamond Rubber Co. organization for a period of ten years, first in the credit department at Akron, and later as Chicago district manager. He then went to the Federal Rubber Co., Milwaukee, Wisconsin, as general sales manager, after two years going to the Continental Caoutchouc Co. in a similar capacity, and on its absorption by the United States Tire Co. was appointed assistant general sales manager of the latter company, followed in 1916 by promotion to general branch sales manager, from which office he resigned to join the Kenyon forces. He is also vice-president of the Dryden Rubber Co., Chicago.

This experience in tire merchandising, covering more than twenty years, and an extensive acquaintance in the trade, should be an invaluable asset in introducing Kenyon cord tires and tubes to the Middle West.

Mr. Tweedy is a member of various Masonic bodies, B. P. O. Elks, Chicago, Detroit and New York Athletic clubs, Siwanoy Country Club, Lambs' Club, and International Sporting Club.

Will Rubber Soles Successfully Replace Leather Soles?

A Discussion of Rubber and Fiberized Soles from New as Well as Old Angles.

By Chester C. Burnham.

MORE AND MORE am I convinced that the day is approaching when a material composed mainly of rubber and some fiber is going to be in quite general demand for the soles of shoes. Rubber manufacturers have made remarkable progress in the manufacture of fiberized soles during the past five years and it is interesting to note that progress and success seems to have been greatest with those who have studied the problems of product and market in the most thorough manner.

There is a profound need for intensive study of the subject of fiberized soles. It is a fact, which even a slight investigation will substantiate, that much of the "grief" experienced by early promoters of so-called "substitutes for leather" was brought upon themselves by an appalling lack of knowledge concerning the uses of the product they marketed. Millions of dollars for mold equipment and advertising were thrown away in a short time through snap judgments and short-sighted policies.

During the war, when sole leather prices went sky high, the fiber sole should have come into its own. By that, I mean to say that economic conditions at that time were decidedly favorable to its introduction and sale in a large way. Unfortunately, obstacles were encountered, and in overcoming them at the start much was done to improve the product, but the expected heavy demands were not realized. How long it may take to regain this lost advantage is uncertain, but with the cattle supply of the entire world decreasing and with our domestic production of hides for sole leather falling off in an alarming manner, there is no question about there being a place for all the leather we can produce and also for a vast quantity of satisfactory fiberized rubber soles.

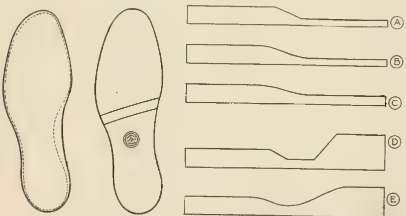


FIG. 1 DOTTED LINES SHOW OLD PATTERN. FIG 2 SHOWING OLD STYLE BEVEL SHANK TYPE OF SOLE. FIG 3 SHOWING VARIOUS STAGES OF SHANK DEVELOPMENT IN MOLD DESIGN.

DEFECTS OF EARLY TYPES.

It is not difficult to recall the very earliest rubber soles that were manufactured. Some of us may not be altogether proud of them now, but we are prepared to admit that they were nearly all heavy, poorly designed for shoe factory manipulation and often composed of very little rubber and very many adulterants. Some you recall, had a very pungent odor which penetrated the insoles of the shoes and even the hose of the wearer and made frequent foot baths necessary. Be that as it may, their sale was large and on a type of foot-wear classified as "vacation shoes." Purchasers of this sort of footwear honestly expected the soles to crack across the ball or break away at the toe stitching long before the soles were worn through and often before the end of a short vacation season.

It is no wonder then, that purchasers often wished for some sort of a rubber sole that would at least last the season through and in addition, furnish a clinging, flexible and waterproof sole the while. It must not be forgotten that this vacation footwear was exceedingly popular with many people as was attested by the enormous sales in spite of unreasonable wearing qualities. It was common for a shoe clerk to suggest to a complaining customer, the advisability of resoling the shoes with leather, although the shoes may not have been a month out of that store and invariably, such shoes were sold without a guaranty for reasonable wear of the soles.

With rubber soles possessing many known deficiencies and yet with an unlimited market in sight and only awaiting development, it is strange that the rubber manufacturers did not pay more heed to improving their products. That there was need for improvement is shown by the accompanying diagrams and even these changes were not thought desirable until after the appearance of fiberized soles. Had the fiberized product not been thought of, it is possible that we might yet be trying to market the old style soles and with the same lack of attention to the requirements of the trade.

But with the introduction of these new products, new uses were found for them and in responding to these new uses a closer study of the use and abuse of soles in the manufacturing as well as in the wearing of shoes was made.

Over night, as it were, rubber manufacturers came to realize that their rubber soles had offered many perplexing problems to the shoe manufacturer because of their varied mold styles. The early style molds resembled the dotted line diagram in Fig. 1, while the standard pattern which soon came into general use, resembled more closely the solid line pattern shown in the same figure. The soles had to be "rough-rounded" or rough trimmed, anyhow, and whereas there might be a slight waste in some patterns the waste was more than offset by the time saved in shifting molds in the press room, by the gain in production and by the ease for all parties to handle their stock room problems.

STANDARDIZED PATTERNS AND IMPROVED MOLDS.

The standardized patterns popularized themselves so quickly that no one thought to improve them further and thus other defects passed into the new mold equipment without notice. It had been thought necessary to have a sharp bevel or pitch to the breast of the sole at the point where the forepart thinned out into the shank. The thread on the sole stitching machines often broke when the machine presser foot came to these sharp rises or when it jumped off into space, and at other times the thread tension increased so suddenly that the soles were entirely cut through as one cuts cheese with a thread.

The first attempt to correct this trouble was in the line of lengthening this bevel. This was better, but trouble was still experienced when the presser-foot of the sole-stitching machine tried to climb up this pitch on one side and down on the other. No very satisfactory results were obtained until some one hit on the idea of making the "fadeaway" or undulating shank. With this type, the presser-foot gained and lost the tension gradually and allowed the automatic thread-controlling tension devices to operate properly.

Even with this improved mold the troubles were not ended, for it was soon found that when soles with heavy foreparts were attached to certain types of shoes, the shanks were often not heavy enough to stand the strain of the stitching and wearing

processes, and gave away. So once more new molds were designed, with the result that, now, nearly standard types are found in use among the most successful manufacturers.

Shapes.	Foreparts.	Shanks.
Men's	12 iron and 10½ iron	7 iron
Boys'	12 iron and 10½ iron	7 iron
Men's	14 iron	9 iron
Women's, Misses', Child's	9 iron	7 iron
	(An iron is equivalent to 1/48-inch.)	

In Fig. 3 we show a rough idea of these various shank changes in sketches *a*, *b*, and *c*, while in *d* and *e* we show the spring heel mold in the old and new designs. The reader can easily imagine how great was the improvement in this particular case. Some shoe manufacturers wanted spring-heel soles with varied heights of heels and thus we soon found on the market heels as high as ¾-inch. This necessitated the plying up of the heel portion of the blank used to fill the mold. It was later found much more practicable to make all spring-heel soles with heels ½-inch in height and then have the shoe manufacturer insert a wedge lift underneath the heel portion of the sole during the process of manufacture.

EFFECT OF POOR COMPOUNDS.

If rubber manufacturers were slow to improve their old molds and compounds, they were not so slow when it came to realizing the possibilities in the new fiberized product and in a short time there was not enough fiber of the proper kind obtainable nor were there sufficient fiberizing machines available to supply the demand for this material. In the crying need of the hour, with many fearing they would be outclassed by competitors, they were not so particular about the kind of fiber they got so long as they got it quickly and in sufficient quantities to enable them to flood the market with their products. Thus it came about that soles were soon on the market whose fibrous content might once have been leather refuse, hemp or jute rope, cork shavings and even grape packing, cotton waste, waste tire duck, silk fiber waste and even paper pulp—anything that could be reduced to a fibrous state quickly.

Of these over-night discoveries and compounds, some were remarkably good, while the vast majority of them reached an early grave. It was immediately recognized that the use of fiber in the soles gave them a much better bonding compound and stitchers in shoe factories found that they could now apply these soles in quantities without cutting the soles through in the stitching process. The fact that these fiberized soles were much lighter in weight was not overlooked and these facts together with their being better adapted to shoe-factory processes, led many to predict that they would soon replace leather.

These favorable points having been brought out through advertisements and trade press comment, the rubber manufacturers rushed to get their new compounds on the market, giving much time to quantity production problems but less attention to the needs of the shoe industry. This lack of diagnosis could but lead to unsatisfactory results and when these new products appeared from various makers they were of varied shapes, colors and thicknesses and not at all in conformity with the needs of the shoe manufacturers. Thousands and thousands of dollars that had hurriedly been invested in additional equipment for molds was wasted and more new equipment was necessary before the soles were fit for the market.

All this happened just prior to our entry into the great conflict and to give some idea of the demand for these soles at that time, it was reported that one large manufacturer was 400,000 pairs short of sales in September, 1915, and this in spite of a daily production of approximately 10,000 pairs. In six months his unfilled orders had almost reached the million pair mark and this in spite of increased production to about 17,000 pairs daily. But the war was on and sole leather had sky-rocketed in price. An economizing public was ready to substitute for leather and it was not long after this that the unfilled orders of this same concern reached a goodly total of nearly 2,000,000 pairs. This is only one case and might be duplicated by several other large firms and imitated in lesser volume by many smaller firms.

AN IMPERFECT PRODUCT.

With all this apparent prosperity for manufacturers of fiberized soles and with the public acceptance practically assured, one hardly reckoned with the rude awakening that all were to get when it was found that many of the compounds failed to withstand the tests of time and every-day usage. Thousands of pairs of shoes were returned to the retailer—to the jobber—to the shoe manufacturer, because they failed in service. Other thousands which had not been applied to shoes were returned from the shoe factories to the rubber manufacturers. Realizing that rubber soles of the previous type had not always given serviceable wear, and anxious to put their new products "across" on the market, many enterprising sales managers had conceived the happy idea of guaranteeing their soles for wear, believing that this guaranty would decrease the sales resistance and make the product more acceptable with the consumer. Had they been sure of their product, all might have been well, but many tempted fate and the poorer compounds came rushing back by fast express and slow freight.

Very likely this was the best thing that could have happened, although it seemed at that time like a near calamity. Through all the disappointment, one fact sticks out clearly, however, and serves as indisputable proof that the process of rubber sole manufacture had undergone a change—a sufficient number of these new-born soles gave extraordinary wear and demonstrated that fiberized soles were extremely practical and worthy of further development.

THE NECESSITY OF IMPROVED COMPOUNDS AND METHODS.

With this fact pasted in their hats, a number of rubber chemists set to work and revised their formulas while others in the manufacturing line set about to study the varied needs of the shoe manufacturers. In this work they were aided by a prominent shoe machinery company, who are directly responsible for important changes in machines and parts used in the application and working of these soles on footwear.

It was learned that the tendency of rubber soles to stretch in wear must in some manner be greatly lessened and reduced to a minimum. Certain rubber ingredients were discarded as injurious to keeping qualities because investigation showed that soles were not often used as soon as received by the shoe manufacturer. Often they laid in the stock room for weeks and even if applied to shoes, the shoes might lie on the retailer's shelf for a season or more before finding an ultimate purchaser. In this way it was estimated that a proper sole should have keeping qualities for at least two years in addition to having wearing service after that time.

A large percentage of soles already marketed, trade-marked as well as unbranded, were unable to pass this test and realizing this, their makers dumped upon the market hundreds of thousands of pairs at a price said to average around 10 cents per pair and without removing or defacing the brands. Naturally this resulted in some of these soles being worn by the unsuspecting public and thus they were easily turned against a product that had not lived up to its advertised goodness and they promptly classified all such soles as unworthy of their patronage.

Such practices were not calculated to inspire confidence in the public mind and more especially at a time when every effort should have been made to restrict the circulation of undesirable merchandise. In fact, these failures threw a chill around the good as well as the bad soles with the result that a number of nationally known firms discontinued their lines and others who were about to launch a new product upon the market, profited by these experiences and indefinitely postponed its production.

ANNUAL REQUIREMENTS TWO HUNDRED MILLION PAIRS.

From the latest shoe manufacturers' directory we learn that there are about 1,000 manufacturers of shoes with a rated daily output of approximately 2,059,400 pairs of shoes. This total includes shoes of all kinds, many of which are not adapted for the use of fiberized soles. It seems fair to assume, however, that at least 50 per cent of this production might be adaptable to fiberized soles and thus we estimate a possible daily requirement of 1,029,700 pairs of fiberized soles.

Unfortunately the shoe industry is seldom able to keep employed at its full rated capacity and we must make further deductions in order to arrive at a fair estimate of the possible demand. It is fair to assume a working year of 200 days' production and we thus find that the total annual requirements of fiberized soles might be 205,940,000 pairs.

Assuming that the rubber manufacturer might desire to run his plant on a basis of 300 working days in the year, we find that this requirement would mean an average daily production of 686,466 pairs per day.

At an average price of 33 cents a pair, this would mean an annual volume of business amounting to $67,960,200. The average price herein taken is a very low one and the reader will note that these figures do not take into consideration anything but the manufacture of new shoes. The repair trade will consume an enormous quantity of soles in addition to the above, and at a slightly increased price.

No actual statistics are available, but the production figures for fiberized soles today are stated by some to be around 25,000 pairs daily, which means that we are now supplying about 3½ per cent of the possible field. A business that has already reached a volume of $2,500,000 yearly and which has a possibility of growth to thirty times that figure, should not be considered lightly, for, while the past five years were profitable ones in these specialized products, there is yet much work to be done.

Only a few retail shops make a reasonable showing of shoes with fiberized soles and when they do display them, their appearance does not always stand well by comparison with leather-soled footwear. A line here and there is the usual finding, but nothing like a complete line for men, women and children. Something must be done to bring this fiberized footwear into the class of its leather-soled brother and a brief discussion of some of the difficulties attending this will not be amiss at this time.

SUGGESTIONS TO SHOE MANUFACTURERS.

It is natural that having pursued the even tenor of their ways for decade after decade, shoe manufacturers should resent the suggestions of rubber manufacturers as to how shoes should be made. That, at least, is a fact, but it does not alter the other fact that the finish of a shoe often commends it to the purchaser. With the edges of fiberized soles left rough and unfinished on the shoes they can never be of prepossessing appearance. This matter of refinement in finish rests largely with the shoe manufacturer because it has been pretty clearly demonstrated that with a little greater care and slightly altered machine equipment or treatment, he can considerably improve the appearance of the fiberized soles on his lines of shoes. The manufacturers of shoe machinery have made the way comparatively easy by perfecting special machines and parts for these processes, but as they mean an increased investment in machinery they have not received the attention they should. The dominating factor in the matter, however, is one of labor. The shoe manufacturer realizes that to finish the edges and bottoms of fiberized soles means an extra operation or at least a different one and this means a change in the existing labor schedule. He does not take kindly to a plan or suggestion that will disturb a class of labor which has already shown itself to be highly sensitive to price schedule agitation and changes. Makers of shoe inks and finishes for these soles have much to do along constructive research work and toward the production of an edge ink that may be set and worked in the customary way without chipping off the edge with slight handling.

Manufacturers admit that fiberized soles do not require the handling before application that leather soles do. They are also aware of the fact that a lesser number of operations is necessary to attach and finish them. Besides these two very substantial savings in handling and manipulation they are confronted by the fact that instead of paying an average price (today) of 90 cents per pair for oak leather soles, they can buy a fiberized sole that will wear as well, if not better, for 45 cents. In addition they may capitalize as they please on the additional benefits of flexibility and waterproofness. Many shoe manufacturers agree that where there is such a ready method of effecting economies in shoe cost without impairing the value to the wearer, a little greater effort in the matter of style and finish is worth while and they are concentrating their attention upon these points.

HINTS TO RUBBER SOLE MANUFACTURERS.

Rubber manufacturers must bear in mind the fact that no fiberized product can be a "blooming" stock and be permanently successful with the shoe trade. Its very appearance is against it and, moreover, all efforts at better finish will have been defeated for this bloom will destroy them.

Fiberized soles that stretch appreciably are equally undesirable, for it matters not whether they stretch in attaching or in wearing, the very mischief is the result. Style features and the lines of the last and pattern are built into a shoe and once built in, they must not be lost through instability in the sole itself. Soles have been produced that are wonderfully free from stretch in either direction so it is evident that this point has been realized.

The fibrous content of these compounds is an important matter for the various ingredients must be bonded together in a tough, fibrous mass that will lend itself to the process of "loose-nailing" these soles in shoe manufacture. Such soles should be available for heavy work shoes where only nailed work is desirable. Some soles have met with partial success in this direction, but for one reason or another the field remains hardly touched as yet. Consider for a moment the fact that such a shoe would have a bottom impervious to the action of lime and phosphate fertilizers used on farm lands, unaffected by the ammonious seepage of barn and farm-yard enclosures, and withal, be waterproof and slip-proof to all kinds of walking.

One of the truly important fields for these supersoles is in the manufacture of children's shoes. Let the little ones go to school staunchly clad with shoes bearing waterproof, slip-proof and durable soles instead of soft, spongy, water and dew-soaking leather soles. Very close cooperation between the manufacturers of children's shoes and fiberized soles should prevail and for mutual advantage.

Some mechanical difficulties seem to have thus far beset those who have tried to manufacture a fiberized product in sheet form. Such a soling would meet with a ready sale as has been proved by the few partially successful attempts in this direction and all that seems now to be necessary is persistent research and mechanical genius to bring about perfected processes for manufacture.

Soles of lighter gravity are also needed. At present the leading products compare favorably with sole leather, but as the thickness of fiberized soles is nearly always greater than leather soles for the same shoe, some product of lesser gravity should come forth to offset the actual difference in weight. Lightweight compounds have been produced with gravities as low as 1.03 which is considerably below the average product today of 1.30. A compromise gravity figure of 1.15 should be easily obtainable.

THE SUCCESS OF COMPOSITION SOLES.

Let it be known that various fiberized soles have already proved their value in wearing tests on the soles of Army shoes in actual warfare and in cantonment usage. Under Government tests these

materials have repeatedly outworn leather soles. In addition they have offered slip-proof and waterproof features besides great flexibility and ease in breaking in new shoes. Not only in the Army have these tests been made, but in civilian life as well, and many reports are available where fiberized soles have greatly outworn leather on the shoes of men, women, boys, and girls.

Men accustomed to being out in all inclemencies of the weather, declare that fiber soles protect their feet completely and give them greater walking comfort than does leather. A railroad fireman once told the writer he liked their "sure footed" feeling when he swung up the steps of his cab and that they outwore leather soles when in contact with hot coals and cinders.

Orthopedic surgeons state with perfect frankness that fiberized soles allow the muscles of the feet to flex and function with greater ease and regularity, and thus guard the feet from many of the ills caused by undeveloped foot muscles and retarded blood circulation in the extremities.

Those who have come to know fiberized soles for what they are have learned to swear by them instead of at them and only lament the fact that they are not obtainable on a greater variety of shoes. Any Boy Scout who has worn fiberized soles will assert that he likes them because he can climb the rocky and grassy places without fear of slipping and that his feet do not tire easily on the long "hikes" with his company.

ATTRACTIVE BUSINESS POSSIBILITIES.

Rubber manufacturers will appreciate the fact that fiberized soles are not a seasonable product like garden hose, but that they are a steady all the year around product for the manufacturer who can produce a compound that will meet the requirements. The whole rubber trade should work together for a product that will meet these demands—one that will attach to heavy shoes with nails, one that will apply to children's shoes without ripping and puffing and one that will apply to house slippers and thus afford comfort and surefootedness at every step. These problems once solved, a business comparable with almost any of the other great industries in rubber is assured.

SIXTH NATIONAL CHEMICAL EXPOSITION.

The Sixth National Exposition of Chemical Industries, which opens September 20, at Grand Central Palace, New York City, will be the biggest display of its kind ever seen. Four floors of the Palace are necessary to house the display, and because of the remarkably wide range of the exhibits this year, the exposition will be divided into sections.

The New Jersey Zinc Co.'s display will occupy booth No. 9 and a portion of booth No. 8, on the main floor, and be in charge of W. Homer Hendricks, general sales engineer. One exhibit will show the route of the zinc ore during manufacture, as well as the ultimate uses of the products. Various zinc products of the "Horse Head" family will also be displayed.

The Morse Chain Co., Ithaca, New York, will exhibit a number of samples of different chains, showing the Morse rocker joint, from ½-inch pitch to 3-inch pitch, and in several widths illustrating the chain as used for ½-h.p. to 5,000-h.p. T. G. Anderson, manager of the New York office, will be in charge, assisted by H. W. Evans, sales engineer.

The Uehling Instrument Co., 71 Broadway, New York City, will exhibit its fuel-saving device at the Chemical Show, and also at the National Association of Stationary Engineers Convention, Milwaukee, Wisconsin, September 13-17. The principal products to be displayed will be the new "Style U" CO_2-recording equipment, which measures the heat discharged up the chimney, and other boiler-room instruments.

The National Aniline & Chemical Co., New York City, will have a comprehensive exhibit of dyes and intermediates of their own manufacture, including rubber chemicals.

CLIFTON SLUSSER, GENERAL SUPERINTENDENT.

Clifton Slusser, who has been appointed general superintendent of the new Los Angeles factory of the Goodyear Tire & Rubber Co. of California, is one of the youngest men in the country holding an executive position of equal responsibility. He is but thirty years old and started with the Goodyear company less than nine years ago.


Clifton Slusser.

Born in Massillon, Ohio, Mr. Slusser left school when eleven years old to go to work as a glass blower. Since then he has been machinist's helper, plumber, and later drifted into the Goodyear employ as stenographer and utility man for William Stephens, now production superintendent of the Akron plant.

Meanwhile he had been adding what he could to his education at night in business colleges. At the Goodyear factory he at once arranged to take a factory course after hours, getting into overalls and working through every department. Whenever an emergency arose he got into it, and the harder the job the better he liked it. When the flood of 1913 tied up the Goodyear plant and volunteer workmen were called for, Mr. Slusser was the first to respond. His work in this emergency brought him to the attention of P. W. Litchfield, factory manager, who chose him to organize the Goodyear Flying Squadron shortly after.

The Flying Squadron is a group of men who have worked through every department of the factory and are used to balance production. It now numbers 1,400 men and has already developed several hundred executives for the company.

All this time Mr. Slusser was studying business economy, factory management and corporation organization at night. Other opportunities came to him. He ran a department while the foreman took a vacation. He took charge of the Canadian plant during the illness of the superintendent. He organized an engineering squadron among the machinists and other mechanical men. Successively he took over the efficiency department, the planning department, the factory expert work, the company's garage and trucking work, the labor department and the aeronautical work. About a year ago he was made personnel manager and admitted to the executive council, a group of five men who, under Mr. Litchfield, are responsible for the operation of the entire factory now employing 33,000 men in Akron alone.

Mr. Slusser's promotion to complete charge of production at the new plant in the West, which will start operations with 5,000 men and will produce 5,000 tires a day at the outset, is the logical climax of his record in Akron.

A NEW RUBBER MAT.

A new white or marbled light, pliable rubber mat, known as the "La-tite," and which is made of live, elastic stock, clings closely to bathroom floors, ships' decks, and similar surfaces by having been cured on a rounded mandrel, which gives an unnoticeable curl to the edges. It has fine corrugations, even soft to bare feet, and can be scrubbed indefinitely. Hotels are using them to save the cost of laundering bath rugs, and for sanitary reasons. They are also being used in front of hotel room doors and dressers to save wear on carpets, the mats being obtainable also in several dark, solid colors to match most carpets. (George W. Eno Rubber Co., 1026 South Los Angeles street, Los Angeles, California.)

INTERNATIONAL DISCUSSION OF CLINCHER AND STRAIGHT-SIDE TIRES.

A very interesting discussion between the editor of "Omnia," the well-known French automobile journal, and the technical assistant to the president of the United States Tire Co., regarding the advantages or disadvantages of the straight-side tire as opposed to the clincher tire, brings out the following points:

THE FRENCH VIEWPOINT.

Americans have gone back to rims with detachable side rings, and even split rings which the countries that invented the automobile, with France in the lead, devised in the early days of pneumatic tires but soon found to be wrong in principle and discarded.

The fundamental fact in this pneumatic tire question is that the Americans have never been able to attain perfection in the manufacture of soft tire beads. They have never been able fully to obtain that combination of strength and flexibility from which the clincher bead tire derives its true value. They grew impatient and not wishing to experiment, pulled out of the dust of our stock-room the stiff bead, the bead with cables buried in it, and decided to use this type of bead in spite of everything.

Europeans mount their tires on one-piece rims by stretching their flexible beads over a groove into which the beads slip once they are in place. This is the clincher type.

Americans do away with the beads, make the sides of their tires straight and vertical, and insert into them non-stretchable steel cables, which makes it necessary first to split the rim and then to reinforce the parts.

If an American has a break-down, in nine cases out of ten he does not personally try to solve the trouble. He puts his car in a garage and leaves the work to a professional repairman.

This custom is easy to follow over there for the reason that automobile riding is largely restricted to cities, big suburbs, and highways, where repair shops are abundant. Such a great number of cars necessarily results in a huge number of repair specialists, it is easy to understand that these specialists can afford first-class shop equipment.

On the other hand, in France the number of automobiles in use is comparatively insignificant—90,000 in 1919. Motor cars are widely scattered and repairmen are few and far between. For these reasons the solution of tire troubles falls on the driver and the work has to be done on the road.

This difference of conditions is vital. It constitutes practically the whole problem.

THE AMERICAN ANSWER.

The straight-side tire was built because it was felt that a more dependable, safe and simple fastening than the hooked bead of the clincher type was needed for heavier cars. For safety and dependability we wanted a tire which could not under any conditions blow out over the rim—one in which the beads did not require a secondary locking device such as lugs, spreaders, etc., to hold them in place once the primary locking device—inflation pressure—suddenly vanished through a puncture or blowout. We also sought a combination of bead and rim contour that would not allow the gouging of the tire by the edge of the rim when sudden deflation occurred in service.

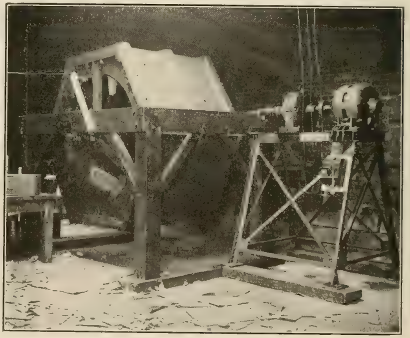
As our development of the straight-side tire progressed, we found that we had introduced not only a more safe, dependable and simple fastening, but also a tire which would deliver consistently greater mileage than the best clincher tire we, or any others, could build. In studying the reasons for this difference, we have come to the conclusion that they lie in the better structural arrangement of the plies of fabric or cord at and above the bead proper and in the larger volume of air carried by the straight-side type. These are the basic reasons and they explain the margin in favor of the straight-side when tires of both types go through a road test without injury. The margin becomes still greater if the tires are run flat even the minimum distance required to stop the car after a puncture or cut has occurred. Under these conditions the deflated straight-side tire lies naturally over the out-turned flanges of the rim without injury, while the in-turned flanges of the clincher rim cut and chafe many miles out of the clincher tire. Furthermore, the straight-side tire will withstand under-inflation far better than will the clincher.

It is very easy to catch the tube under the toe of a clincher bead in mounting the tire—something which can not happen to the tube in a straight-side tire. Also, unless lugs are used, the tube in a clincher tire can easily be pinched under the beads when the toes of the latter rock as the car takes a curve at speed. In the straight-side type there is no rocking of the beads under any conditions.

TESTING SHIPPING BOXES.

In a test for strength of shipping boxes, the object of which is a simulation of the rough knocks, bumps and jars of handling which a loaded box may encounter in railroad traffic, there has been designed a machine by which the railroad usage which a box may meet in a 2,000-mile haul can be duplicated in four or five minutes.

The first machine of this kind—known as the drum box-testing machine—was designed by the United States Government Forest Products Laboratory at Madison, Wisconsin. The results of the box tests made at this laboratory were published in The India Rubber World, August 1, 1919, pages 626-628.



Drum Box-Testing Machine.

The machine installed at the Mellon Institute, shown herewith, is an improvement over the original tester in that the inconvenience of overhead pulleys and shafting has been done away with by the substitution of a reduction gear for cutting down the motor speed to the drum speed of two revolutions per minute.

A valuable field of investigation and scientific study of the construction and materials of packages is opened up by the new machine, such as best methods of interior and exterior packing for fragile or irregular shaped objects; the determination of proper specifications for containers carrying various commodities, etc.

The Container Club of Chicago, an association composed of corrugated and solid fiber box manufacturers of the United States, offers free service in the designing of scientific packing methods for the various commodities capable of being shipped in fiber containers.

Rubber Hose in Painting, Asphalt and Cement Coating.

Through the development of paint guns, sprayers, and atomizers, for applying paints and protective coatings by the use of compressed air, rubber hose is now used very extensively. Painting with mechanical appliances for concrete and masonry surfaces, structural ironwork, bridges, ships, mesh-wire factory fences, tanks, castings, machinery, car trucks, underbodies and other large equipment has been a recognized method for several years, and has generally superseded the hand painter.

With the modern paint gun the work is done when wanted in a remarkably short time, with little or no interruption of business, without depending on a large labor force and at the lowest possible cost consistent with a thorough, durable job. The early difficulties, such as loss of paint, excessive scattering and spattering over surfaces not to be painted, lack of control in the wind, and volatilization of the paint oils while passing through the air have been overcome by the perfection of ingenious patent nozzles and the provision of special full body oil paints peculiarly adapted to the purpose.

With an ample length of rubber hose and a twelve-foot extension arm, scaffolding and swing - staging can be dispensed with very largely. Out of doors one man and a helper can cover from 1,000 to 2,000 square feet per hour, multiplying the labor value from eight to ten times. As compared with the hand method a saving of approximately $1.50 per gallon can be effected. Indoor painting jobs can be done at the rate of 1,000 to 1,600 square feet per hour. The right paint applied to factory interiors by this method will conserve much light, thereby saving electric current, eyesight and daylight working hours. It gives a smooth, fine, hard, dirt-resisting coating having neither the chalky whiteness that absorbs light and quickly becomes dirty, nor the glossy surface that causes a blinding glare or dazzling flicker. It diffuses light as it reflects it and fills the interior with a soft, even radiance. Moreover, a film of paint can be built up in one operation that is the equivalent of two or three hand brush coats.

The method is equally efficient on any surface, from smooth wood finish to the roughest masonry, and can be used to special advantage on cast stucco, rock-faced walls, rough lumber, brickwork with recesses, broken-down masonry joints, surfaces under eaves, lattice work, structural steel, and all places inaccessible to a brush. This is because the perpendicular application of the paint is certain to penetrate voids better than brushing across the surface.

An efficient brushing action by the powerful compressed air jet is of advantage for cleaning dirty surfaces and in reaching corners and crevices for which the hand painter's implements, the wire brush, putty knife and cloth, are inadequate.

Special Rubber Hose Is Necessary Equipment for Pneumatic Spraying Machines.

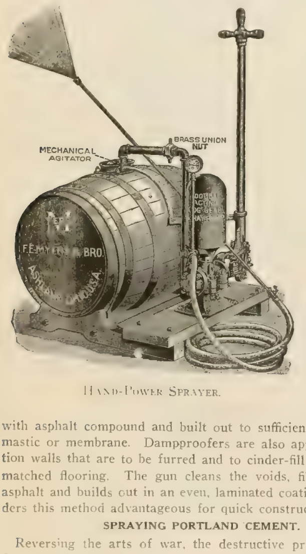
A pneumatic painting outfit consists essentially of a paint tank with the necessary valves, gages, etc., a motor-driven air-compressor, a nozzle or brush and the rubber connecting hose for paint and air. The paint, ready for application, is poured into the tank. An agitator, operated by hand or compressed air, is available for use when necessary. A compressed air line leads to the tank with a branch line for air and paint from the tank to the nozzle. Sometimes the former is ordinary ⅜-inch heavy air hose, while the latter is ¼-inch flexible metal-lined oil suction hose, having coiled coppered-steel wire embedded in the wall to give it strength and rigidity. The lining, friction and cover of this hose are specially compounded to resist the action of the oil and paint, as it is important that the rubber shall not flake or peel off and get into the delicate orifices of the spraying nozzle. The adhesion of the rubber friction must be especially strong in order to retain the wire firmly in place. Special paint hose, three, four and five-ply, is also made with internal diameters of ⅜, ½, ¾, 1 and 1¼ inches, having a ply of seamless braided material over the plies of duck, with a rubber cover over this, so that the structure of the hose is held intact, preventing the duck from unwrapping and coming apart after long contact with oil and paint.

Many of the leading rubber companies are employing these pneumatic painters for their buildings, factory interiors, etc., and several of them use a special equipment with a compact nozzle

resembling a pistol and trigger operated to paint the inside of pneumatic tire casings with soapstone paint. For whitewashing and applying cold water paint to factory interiors, where power is not available, a double-acting cog-geared spraying machine that operates by hand can be utilized to excellent advantage.

ASPHALT AND ROCK GRIT SPRAYING.

The pneumatic spraying principle has also been applied in building. By means of a special gun, side walls and ceilings are plastered, foundations and floors are damp-proofed and concrete structures are waterproofed, with a coat of pure asphalt compound, applied at normal temperature and under high pressure. This hermetically seals the surface and protects the plaster against water damage, stain, cold air infiltration and the lime sulphite salts in concrete which cause plaster to decrystallize. Over this a coat of rock grit, also gun applied, makes a scratch coat that requires only a finish coat of plaster in order to give a ceiling of excellent whiteness for light conservation or ideal for decorating. Side walls prepared in this manner and given two, instead of the usual three coats of gypsum hard plaster, afford complete insulation, overcoming all sweating and condensation of moisture. For applying the scratch coat, sand-blast hose is used, having a heavy lining of rubber to resist the cutting action of the rock grit.



HAND-POWER SPRAYER.

With the asphalt gun concrete structures, such as basements, reservoirs, bridge decks, etc., are water-proofed with asphalt compound and built out to sufficient thickness with mastic or membrane. Dampproofers are also applied to foundation walls that are to be furred and to cinder-fill mixtures under matched flooring. The gun cleans the voids, fills them full of asphalt and builds out in an even, laminated coating. Speed renders this method advantageous for quick construction.

SPRAYING PORTLAND CEMENT.

Reversing the arts of war, the destructive principles of gunfire are being employed in the constructive arts of peace, and a cement gun, much like the paint and asphalt guns, is being used for rapid-fire building in England. At Southend-on-Sea a house-building company is putting up houses having wooden frames covered with tar felt and wire meshing. A cement gun is used to spray prepared cement from a large hopper to cover the meshing. In this way 15,000 square feet can be laid in eight hours.

These modern methods in building and structural maintenance depend in large measure upon flexible rubber hose for their efficiency. And confronted as the whole world is by such a serious shortage of houses, it seems likely that these devices which save time and labor, speed up production, and save expense, will quickly come into general use.

REPLETE WITH INFORMATION FOR RUBBER MANUFACTURERS—H. C. Pearson's "Crude Rubber and Compounding Ingredients."

JUDICIAL DECISIONS.

GAMMETER VS. BACKDAHL.—Court of Appeals, District of Columbia. Decided June 2, 1920.

Appeal from a decision of an assistant commissioner of patents in an interference proceeding awarding priority to Backdahl for an invention filed December 14, 1915, relating to a metallic mandrel for curing tires. Gammeter conceived and disclosed his invention September 7, 1915, endeavoring meanwhile to evolve a fluid-tight, expansible lead core adapted to produce a cord as well as a fabric tire.

The Examiner of Interferences and the Board of Examiners-in-Chief held that Gammeter was diligent at the time Backdahl entered the field and reasonably diligent from that time until the filing of his application. The Assistant Commissioner disagreed with this finding and therefore reversed the decisions of the lower tribunals.

Where, as here, it clearly appears that the party first to conceive the invention was in good faith engaged in perfecting it at the time his adversary entered the field, that party should not be deprived of the fruits of his discovery because his efforts were not as successful as he hoped they would be.

Therefore, the Examiner of Interferences and the Board of Examiners-in-Chief, being convinced that Gammeter was not lacking in diligence, reversed the decision of the Assistant Commissioner and awarded priority to Gammeter. ("United States Patent Office Gazette," July 27, 1920.)

THE WOOLDRIDGE & FOX BALLOON FABRIC PROOFING PATENT.

In 1916, patent No. 105,137 was granted to Wooldridge & Fox, for "Improvements in impregnating compositions for proofing fabrics and other flexible materials." In 1917 the North British Rubber Co., Limited, applied for revocation of that patent, or a specific reference to its own patent, No. 5,915 of 1915, for "An improved fabric for balloon envelopes and the like, and the method of manufacturing and aftertreating the same," on the ground that the invention claimed in the patent of 1916 had been claimed in the patent of 1915.

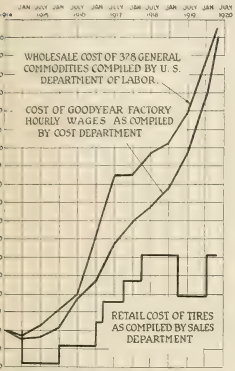
The application was dismissed by the Chief Examiner, who ordered, however, that the specification be amended by the insertion of a general reference to the state of the art. An appeal to the Court by the North British Rubber Co., Limited, was later dismissed, it being held that the invention of the patentees was not the same as that of the opponents; that, even if a fabric made in accordance with the claims to which objection was taken would be an infringement of the opponent's patent, that would not in itself, be a sufficient reason for striking out those claims; that the object of the insertion of a specific reference was not to preserve or assist the opponent's rights, but to protect the public in cases in which, but for the insertion, they would be likely to be misled; and that there was not sufficient reason for giving any special warning. (Supplement to "The Illustrated Official Journal" [British patents], June 30, 1920.)

"BOX WORN" MEANS ABOUT THE SAME THING IN THE AUTO INNER tubes as "shop worn" means in clothes. Both are damaged goods. When an inner tube leaves a rubber factory, it is ordinarily packed in waxed paper and placed in a box to keep it in perfect condition. But this waxed paper packing will not protect the tube carelessly thrown in the tool box of a car, where the constant jolting and swerving of the car cause the loosely packed tube to chafe through at the folds.

Tubes will remain in the same serviceable condition as when placed in the car, if carefully wrapped in soft cloth or paper so that they cannot slide around in the wrapping. Better even than this, however, is the purchase of a tube bag. It is not only excellent but cheap insurance against tube cutting and chafing. (The Miller Rubber Co.)

THE DOLLAR IS BIGGEST IN BUYING TIRES.[1]

Careful analysis of the rubber tire manufacturing business does not indicate a downward trend of tire prices, according to expert business analysts, whose opinion is based upon the comparative increases in price of practically all commodities within the past six years, and the fact that automobile tires are today nearer their pre-war level of prices than nearly every other staple article upon the American market. The basic factor in drawing the conclusion that tire prices will remain staple while prices of many other articles may be expected to drop with further deflation of currency, is the fact that the consumer now is paying only forty-one per cent more for tires than in 1914, whereas he is paying 253 per cent more for wearing apparel than in 1914, over 113 per cent more for fuel and light, 267 per cent more for sugar, and 231 per cent more for household furnishings, with commensurate percentages of increase in the prices of practically all other commodities.



General commodities have increased 165 per cent since August, 1914.
Wages have increased 160 per cent.
Tire prices have increased 41 per cent.

Chart Showing Why Present Tire Prices Are Low.

The sudden curve back from the peak of high prices, precipitated by currency deflation and restriction of credit, unquestionably has led many motorists to anticipate a drop in tire prices, and consequently has caused many to delay contemplated purchases until the drop could come. But the comparatively low price of tires at this time does not indicate such a downward trend. Hence it is argued that while the American public may be justified in waiting for prices of certain commodities, which now are selling at better than 100 per cent advance over 1914, to decline, there is nothing to justify a similar decrease in prices of tires.

Another important factor is the added mileage and greater durability of the highly perfected tire today. Six years ago a four-thousand mile tire was unusual. Today, an 8,000-mile tire performance is a very ordinary record. Figuring conservatively upon this mileage basis alone, a 1920 tire will deliver at least 100 per cent more mileage than a 1914 tire, and yet costs but 37 per cent more. The tire selling for $50 in 1914 cost one and one-quarter cents per mile, based on 4,000 miles of service. The same tire now gives at least twice the mileage and costs only $70, making the cost per mile only seven-eighths of a cent. This means that the same mileage actually is being purchased today for 30 per cent less money.

This improvement in the 1920 tire over the 1914 tire, it is pointed out, even is more marked in a comparison of the 1910 tire with that of today, the average mileage today being fully three times that of a 1910 tire. Motorists in 1910 paid $35.65 for a 30 by 3½ tire, and $11.90 for the same size of tube. Today they pay only $23.50 for the same tire and $4.50 for the tube—getting three times the mileage for $19.55 less money. On the 34 by 4 tire, the 1910 price was $53.40 compared to $40.10 today, and $14.90 for a tube as compared to $36.30 today—a saving to the motorist of $21.90 per tire, or $87.60 for full tire equipment, with three times the 1910 mileage.

There are several elements directly responsible for this condition. Principal among them is the improved method of manufacturing automobile tires, of raising and curing rubber and of making cotton tire fabric, all made possible through long experience, careful research work and the invention of more modern machinery. Secondly, quantity production has permitted greater manufacturing economy, overhead reduction and the marketing of the finished tire at a lower cost to the consumer. Were conditions normal and were the purchasing value of the dollar not cut practically in two, prevalent tire prices might not be considered so unusual. But when it is taken into consideration that wages, freight rates, food prices, the cost of cotton and the various compounding ingredients used in the manufacture of tires have soared, and in nearly all cases more than doubled, the fact that automobile tires are of better quality and yet are selling for less than they did ten years ago constitutes a refreshing thought and a decided relief from the incessant reminder of the high cost of living.

Since August, 1914, the price of cotton has jumped from 20 cents a pound to $1.35 a pound—an increase of 575 per cent. The manufacturing cost of cotton fabric for automobile tires has increased 190 per cent, while the cost of compounding ingredients has increased approximately 68 per cent. The price of crude rubber today is unusually low, compared to other materials; but the present low level in price does not affect tire prices, due to the fact that vast quantities of rubber were contracted for before the break in price.

The present "hold back" attitude of the motoring public is believed due to a misunderstanding of actual facts, and to a lack of appreciation of the availability of automobile tires at prices so near their pre-war level. In business circles it is felt confidently that prices of practically all other commodities will have to break and show an appreciable decline, before the situation will justify any reduction in tire prices.

How the Purchasing Value of Our Dollar Has Shrunk! These Shaded and Dark Areas Show the Percentage of Decrease in a Dollar's Purchasing Power, with Reference to Various Commodities, as Compiled by the United States Department of Labor.

A new form of composite belting is the invention of Robert Russell of Middleton, England. It affords a new use for waste leather, and is said to combine all the advantages of balata and rubber belting, without the disadvantages of either. It does not absorb oil and moisture, as a leather belt does; nor is the outside portion wrenched and stretched, as is so often the case with rubber belting.

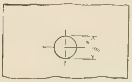
[1] By Ralph C. Busbey, Goodyear News Service.

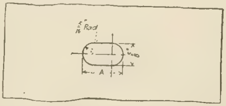
S. A. E. Standards Report of the Tire and Rim Division.

The following report of the Tire and Rim Division of the Society of Automotive Engineers, as amended and accepted by the Standards Committee, was approved by the Council at the general meeting of the Society, held at Ottawa Beach, Michigan, June 21. These new standards require only the approval of the members of the Society to be obtained by letter ballot.

AUTOMOBILE RIM VALVE HOLES.

The Tire and Rim Division recommends that the present S. A. E. standard for automobile rim valve holes be extended to include the dimensions for the 5, 8 and 10-inch tire rims and that certain lengths in the present standard be increased. The present S. A. E. standard revised and extended as recommended by the Division is given in the accompanying table:





Rim size ......inches	3½	4	4½	5	6	7	8	10
A (min.)	5/8	5/8	5/8	1 13/16	2 5/16	2 5/8	3¼	4⅛

FELLOE-BAND TOLERANCES.

Owing to variations in the thickness of commercial tapes, with the resulting inaccuracy of wheel measurements, it is recommended that approved standard tapes be used for measuring felloe-band circumferences, of which one set is intended for truck and one for passenger-car wheels.

The Division therefore recommends that the present S. A. E. standard for allowable tolerances in felloe-bands be extended to include the following note:

> It is recommended that all measurements of truck and passenger-car wheel circumferences be made with approved standard wheel tapes furnished by the Tire and Rim Association.

DEFLECTION AND SET TEST OF AUTOMOBILE PNEUMATIC TIRE RIMS.

The present S. A. E. standard for deflection and set test of automobile pneumatic tire rims specified the pressure, deflection and permanent set for 3½, 4, 4½, 6 and 7-inch rims only. The Tire and Rim Division now recommends the pressure, deflection and permanent set for the 5, 8 and 10-inch rims. The present S. A. E. standard extended to include the Division's recommendation follows:

PNEUMATIC TIRE RIM TESTS.

Rim Size Nominal, Inches.	Maximum Pressure, Pounds Per Square Inch.	Maximum Deflection, Inches.	Total Permanent Set, Inches.
3½	140	0.06	0.02
4	160	0.07	0.03
4½	180	0.10	0.06
5	190	0.12	0.06
6	200	0.15	0.06
7	225	0.15	0.06
8	250	0.15	0.06
10	250	0.15	0.06

The deflection should be measured from a fixed inflation load of 25 pounds per square inch for 3½, 4 and 4½-inch sections, and 50 pounds per square inch for 5-inch and larger sections up to the maximum pressures given.

MOTORCYCLE RIM SECTIONS.

Circularization of the motorcycle industry last year indicated that standard current practice includes only tire sizes which are mounted on the CC rim. These tire sizes were adopted by the Society last winter and in order that the rim specification shall be in conformity with this list of tire sizes the Tire and Rim Division recommends that the BB rim section be withdrawn from the present S. A. E. recommended practice for motorcycle rim sections. It is the opinion of both the Motorcycle and Tire and Rim Divisions that the BB rim section can be reestablished as a standard should the use in the future of light weight motorcycles carrying the BB rim become general enough to warrant its inclusion in the standard.

CARRYING CAPACITY OF SOLID TIRES.

Solid Tire Width, Inches	36-Inch Diameter or Less	40-Inch Diameter.
3	1,000	.....
3½	1,300	.....
4	1,700	....
5	2,500	3,000
6	3,500	4,000
7	4,500	5,000
8	5,500	6,000
10	7,500	8,000
12	....	10,000
14	....	12,000

The present S. A. E. standard for carrying capacity of solid tires has been criticized to the effect that at rated truck capacity an increase in the tire carrying capacities would be justified in practically all sizes and would conform to general practice.

The Division therefore recommends that the carrying capacities specified in the present S. A. E. standard for carrying capacities of solid tires be revised to conform to capacities given in the above table.

PNEUMATIC TIRES FOR PASSENGER CARS AND COMMERCIAL VEHICLES.

The Division recommends that the present S. A. E. standard for pneumatic tires and rims for passenger cars and commercial vehicles be revised so as to eliminate the 42 by 9-inch tire and rim as regular equipment. This size tire is considered a special application as the oversize for the 40 by 8-inch on pneumatic-tired trucks and not as a regular size. It is also felt by the Division that the 44 by 10-inch is now well enough established to be included in the standard as regular equipment.

The S. A. E. standard revised as proposed is as follows:

Nominal Tire and Rim Sizes.		Oversize Tire.		Tire-Seat Diameter (Rim).		Type of Rim.
In.	Mm.	In.	Mm.	In.	Mm.	
30x3½	90/585	31x4	105/585	23	585	Clincher
32x3½	90/635	33x4	105/635	25	635	Straight side
32x4	105/610	33x4½	120/610	24	610	Straight side
33x4	105/635	34x4½	120/635	25	635	Straight side
33x4½	120/610	34x5	135/610	24	610	Straight side
32x4½	120/585	33x5	135/585	23	585	Straight side
34x4½	120/635	35x5	135/635	25	635	Straight side
34x5	135/610	36x6	150/610	24	610	Straight side
36x6	150/610	38x7	175/610	24	610	Straight side
38x7	175/610	40x8	200/610	24	610	Straight side
40x8	200/610	42x9	225/610	24	610	Straight side
44x10	250/610	....	....	24	610	Straight side

RIM SECTIONS AND CONTOURS FOR PNEUMATIC TIRES.

The Tire and Rim Division recommends that the present S. A. E. standard for rim sections and contours for pneumatic tires for passenger cars and commercial vehicles be revised in accordance with the dimensions submitted in the following table. This table has been extended to include the dimensions for the 5-inch rim recently adopted and for the 10-inch rim which is recommended for adoption. The radius of the fillet for the 3½, 4 and 4½ straight-side rims has been increased from 3/32 to 3/16-inch owing to trouble which has been experienced with rims cracking at this point. Tolerances have also been placed upon the height of the 3½-inch rim.

These revisions have been adopted by the Tire and Rim Association and are in accordance with present practice.

There was considerable discussion in the Standards Committee meeting relative to establishing in the standard a single set of rim and felloe-band dimensions to provide for interchangeability of the 36 by 6, 38 by 7 and 40 by 8-inch pneumatic tire on a single rim, and also the interchangeability of this application on the wheel. This matter is to receive early consideration by the Tire and Rim Division and representatives of other automotive industries who are interested in this matter.

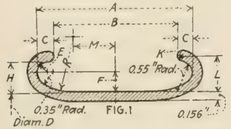


FIG. 1

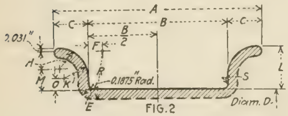


FIG. 2

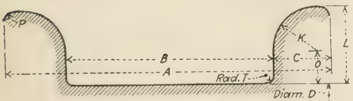


FIG. 3

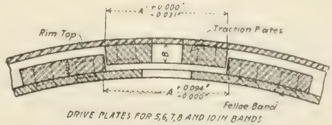


FIG. 4. TRACTION PLATE DIMENSION.

Rim Size.	A	B	Width of Traction Plates.
5	[illegible]	[illegible]	1½
6	2½	⅜	2
7	2½	⅜	2¼
8	[illegible]	[illegible]	2⅝
10	3	⅝	3¼

NOTE. Information recently received indicates that this report as approved by the Standards Committee should be modified as follows:

Dimensions A′ on the drawing are the same as A in the table and the tolerance on A′ should be plus 0.000-inch, minus 0.031-inch. The width of traction plate for the 10-inch rim should be 3⅛-inch. In marking letter ballots members should indicate whether they approve the report with these corrections included.

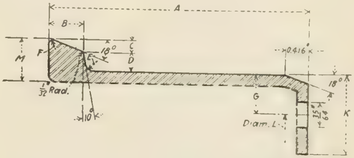


FIG. 1. 5, 6, 7 AND 8-INCH FELLOE-BAND.

PNEUMATIC TIRE-RIM SECTIONS AND CONTOURS.

Fig. No.	Nominal Tire and Rim Size.	Rim Diam. (Tire Seat).	Rim Circum. (Tire Seat) ±0.046.	A.	B. Nom.	B. Tol.	C.	R.	E.	F.	H.	K.	L. Nom.	L. Tol.	M.	O.	P.	S.	T.
1	30x3½	23	72.257	2.600	2.050	±0.046	0.275*	0.910	0.1400	0.3400	0.50	0.0780	0.5780	±0.008	0.680	.....	.	....	......
2	32x3½	25	78.540	3.432	2.312	±0.046	0.560	0.840	0.1875	0.2500	0.32	0.5100	0.6870	+0.0125	0.367	0.1990	. .	0.0625	......
	32x4	24	75.398	3.888	2.688	±0.046	0.600	0.840	0.1875	0.2500	0.34	0.5600	0.7800	—0.0075	0.440	0.2450	.....	0.0625	......
	33x4	25	78.540																
	34x4	26	81.681																
2	32x4½	23	72.257	4.380	3.120	±0.046	0.630	0.840	0.1875	0.3125	0.38	0.6150	0.8750	—0.0075	0.495	0.3030	. .	0.0625	......
	33x4½	24	75.398																
	34x4½	25	78.540																
3	34x5	24	75.398	5.310	3.750	±0.047	0.780	.....	......	......	....	0.6250	1.0625	±0.024	.....	0.4375	0.0940	...	0.2500
	36x6	24	75.398	6.330	4.330	±0.047	1.000	.....	......	......	....	0.7187	1.2656	±0.024	....	0.5469	0.1400	....	0.2500
	38x7	24	75.398	7.000	5.000	±0.047	1.000	.....	......	......	....	0.7187	1.2656	±0.024	. . .	0.5469	0.1400	....	0.2500
	40x8	24	75.398	8.500	6.000	±0.063	1.250	.....	......	......	....	0.8750	1.5000	±0.031	.....	0.6250	0.1500	. . .	0.3125
	44x10	24	75.398	10.330	7.330	±0.063	1.500	.....	......	......	....	1.2500	2.0000	±0.031	....	0.7500	0.1875	. .	0.3125

All dimensions are in inches. *Tolerance of +0.016, —0.008 in. apply to this dimension.

PNEUMATIC TIRE FELLOE BAND.

An agreement has been reached among rim manufacturers for the dimensions of the 5, 6, 7, 8 and 10-inch pneumatic truck tire felloe bands, which are given in the accompanying tables. This proposal has been accepted by the Tire and Rim Association and the Tire and Rim Division recommends it for adoption as S. A. E. standard.

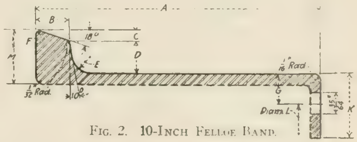


FIG. 2. 10-INCH FELLOE BAND.

PNEUMATIC TIRE FELLOE-BAND DIMENSIONS.

Fig. No.	Rim Size.	A.	B.	C.	D.	E.	F.	G.	K.	M.	L. Bolt Circle Diameter.	Bolts (Fig. 3). Number.	Bolts (Fig. 3). Length.
1	5	2 31/32	19/32	0.153	¼	⅛	1/32	0.656	1⅜	0.558	21.375	8	3¾
1	6	3 7/16	9/16	0.183	17/64	⅛	1/16	0.750	1⅜	0.636	21.125	10	4½
1	7	4 7/32	9/16	0.183	17/64	⅛	1/16	0.750	1⅜	0.636	21.125	10	5¼
1	8	4 7/16	9/16	0.183	23/64	⅛	1/16	0.625	1⅜	0.729	21.125	10	5½
2	10	5 9/16	⅝	0.203	0.620	⅜	1/16	0.563	1¼	1.042	20.625	10	6½

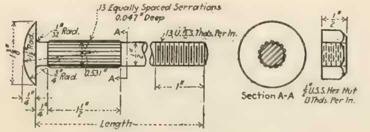


FIG. 3. BOLT AND NUT.

NOTE.—Information recently received indicates that this report as approved by the Standards Committee should be modified as follows:

Dimensions G in the table apply to felloe-bands for metal wheels. The corresponding band dimensions for the 6, 7 and 8-inch rims for wood wheels should be 0.688-inch. The felloe-band bolt circle diameter L for the 6 and 7-inch rims on wood wheels should be 21¼ and 21-inch for the 8-inch size.

In marking letter ballots members should indicate if they approve the report with these corrections included.

CARRYING CAPACITIES AND INFLATION PRESSURES FOR MOTORCYCLE TIRES.

The revised S. A. E. Standard for motorcycle tire sizes includes 3 and 3½-inch sections only, and it is therefore recommended by the Division that the carrying capacity and inflation pressure for the 2¼-inch motorcycle tire be omitted.

A Fund for Botanical Research in the Tropics.

THE CONTINUED SUCCESS of tropical agriculture, notably plantation rubber, tea, coffee, coconuts, fibers and timber, is dependent very largely on maintaining an adequate force of properly trained scientific men to supervise the work. A veritable army of specialists is required to attend to the many diseases now attacking cultivated plants, to the biochemical problems associated with the manufacture of tropical produce, to questions of plant breeding and selection, and also the bacteriology of soils.

It is from the Imperial College of Science and Technology in London, England, that most of the trained men in this field have come in the past and must come in the future. Tropical agriculture has been to a great extent a British industry, and the Botanical Section of the Department of Biology of the Imperial College has in consequence become the recognized fountain head of information pertaining to it.

The Botanical Section is staffed by ten eminent professors, lecturers and demonstrators and many graduate students are doing excellent work in rubber growing and tropical agriculture generally. Among the latter may be mentioned H. G. Freeman, director of the Royal Botanic Gardens at Trinidad, and assistant director of agriculture for the West Indies; R. M. Richards, mycologist to the Planters' Association of Malay; F. J. F. Shaw, D. Sc., mycologist to the Indian Agricultural Service at Pusa; E. Bateson, assistant mycologist to the Agricultural Department of the Federated Malay States, now in Borneo; W. Noel, assistant superintendent in agriculture, Barbados, now mycologist to the Imperial Department of Agriculture in the West Indies; C. O. Farquharson, Government mycologist in Nigeria, recently deceased; A. Sharples, chief mycologist, Federated Malay States; H. C. Pinching and H. Sutcliffe, mycologists to the Rubber Growers' Association, Malay; H. W. Jack, assistant inspector in agriculture, Federated Malay States; A. T. Reeve, plant physiologist and mycologist to the Rubber Growers' Association, Ceylon; T. Thornton, cotton and fiber expert, Nigeria; T. Laycock, Agricultural Department, Kamerun and Nigeria; F. D. Stock, botanist to Burma, India Office; W. L. Hall and H. R. Jones, entomologist and mycologist, respectively, to the Egyptian Government; Sydney Morgan and G. S. Whitby, chemical researches on rubber for the Rubber Growers' Association.

An exhibition was recently held by the Imperial College to illustrate the diseases affecting rubber trees and the laboratory methods now adopted to determine the life histories of specific fungi harmful to cultivated plants. Many prominent rubber growers in attendance expressed a wish that the exhibit might remain available for permanent study, so that their codirectors, managers and assistants might, from time to time, interest themselves in the mycological research carried on by the Botany Section. Unfortunately this is at present impossible, owing to the limited space in the present buildings of the Imperial College and the overcrowded condition of its various departments. Moreover, for the same reason, the rector of the college has very reluctantly had to refuse admittance to a large number of students desiring to specialize in research of value to the plantation world.

Even in pre-war days the Department of Biology found it almost impossible to satisfy the demand for men to engage in research relating to plant diseases. There is ample evidence that the future demand will be out of all proportion to the supply, both private firms and the Government having evidently decided to maintain and increase the number of scientific officers to act as advisers on problems of plant sanitation, breeding and soil conditions.

The Department must, even if it is to meet the demands made in the interests of tropical plantations alone, be supplied with additional laboratories and money for the extension of its work, to say nothing of an endowment fund. A site has been selected and plans prepared for extensions near the existing botany building, to cost, for erection alone, £70,000. The Imperial College has received assistance on a large scale from the Government, and from the London County Council towards its annual maintenance, but is now compelled to seek private aid, and a public appeal has been issued by Lord Crewe, chairman of the governing body, Alfred Keogh, rector of the College, and J. B. Farmer, professor of botany and director of the biological laboratories.

Realizing the importance of the work to private enterprise in tropical agriculture, appreciating its debt to the Imperial College for bringing expert rubber staffs to their present state of efficiency, and knowing that helping this cause helps the plantation rubber industry, the Council of the Rubber Growers' Association has unanimously resolved to give its support to the appeal. A subscription of £1,050 has been pledged by the Association and an appeal signed by Norman W. Grieve and Stanley Bois, chairman and vice-chairman, has been issued to members and other interested parties. A permanent advisory committee of the Association will confer with the staff of the Botany Section of the College from time to time on matters of importance to tropical plantations.

Up to June 25, 1920, subscriptions totaled £15,700, as follows: Rubber Growers' Association, £1,050; Harrison & Crossfield, Limited, £1,000; Herbert Wright, £1,000; company groups, £10,-364; individual companies, £1,992; non-producers, £294. Checks for this fund should be made payable to the Rubber Growers' Association and crossed "Botanical Research Account."

THE MILLER RUBBER CO., AKRON, OHIO, IS INCREASING THE space devoted to its tire-repair school, so that it will be able to double the number of pupils accommodated. Four hundred have already been graduated and there are now forty-five enrolled. Sometimes classes are even larger than this number.

TORON AND TORON-TREATED TIRES.[1]

A new article, "Toron," has recently been developed as a means of decreasing the cost, improving the quality and prolonging the life of both pneumatic and solid automobile tires. In the manufacture of tires, it is employed as a liquid to impregnate the fabric, cord and other fibrous material used in their construction. Chemically described, it is a sulphur terpene compound produced from reaction between turpentine and sulphur dissolved in a solvent such as xylol.

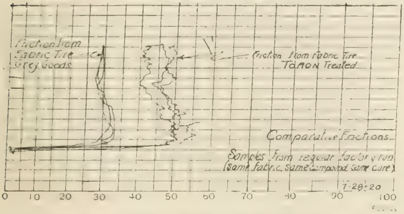


Fig. 1—Graphic Chart Showing Comparative Friction Tests

A marked characteristic of toron is its capacity to thoroughly penetrate fibrous material so that the fabric or cord is completely impregnated after the solvent is evaporated. This material possesses the additional characteristic of acting as a dye, thus coloring gray goods a pleasant yellow or khaki color. Moreover, the impregnated material gains in strength so that after treatment in association with rubber in a tire structure, American peeler acquires a strength comparable to Egyptian or Sea Island fiber as used in the manufacture of tires under the prevailing practice.

FRICTION INCREASED BY USE OF TORON.

More important still is the fact that rubber may be calendered to toron-treated fabric with ease and with a complete absence of skips or blisters, as the surface of the fabric is uniformly prone to adhesion with the rubber. As a consequence of this, spreading becomes unnecessary and this expense is eliminated, moreover, the friction is greatly increased. From actual tests of fabric tires built by the same maker and of identical construction except that one was built of untreated gray goods, while the other was built of a piece of the same gray goods treated with toron, the friction of the first was 15 pounds while the friction of the second was 24 pounds. Hence a 60 per cent increase in friction was realized from the use of toron-treated fabric in the building up of the tire. Fig. 1 shows this increase in friction.

IMPROVED RESISTANCE TO DESTRUCTION BY FLEXING.

As is well known under the stress and strain, to which a revolving tire is subjected, owing to the roughness of the road, the tire is being continually contracted and expanded by an irregularly acting torsional force which causes "flexing." It is probable that flexing is the severest of the many adverse influences to which a tire is subjected in actual use, and this flexing tends to cause separation of the fabric, leading to bulging and blowouts.

In a toron-treated tire the surface of the fabric ply is not only uniformly attached to the rubber, but during vulcanization the rubber flows between and around the threads of the fabric, penetrating them and bonding them to the next ply, as shown in Figs. 2, 3, 4 and 5. As a consequence the load of flexing is carried by the rubber to a larger extent than in the older tire construction, since it is more difficult to separate rubber from rubber than rubber from gray goods.

In flexing, the play of fiber on fiber of the fabric causes these fibers to wear out. Resistance to this has been found to be greater in the case of fabric made of Sea Island or of Egyptian cotton than of American cotton, but it has now been shown that when fabrics made from American peelers have been toron-treated and built into tires they show a resistance to flexing equal if not superior to that of tires built with Sea Island or Egyptian cotton. From tests carried out on commercial vehicles it is assured that fabric tires may be constructed and sold carrying a guaranty of a minimum mileage of ten thousand miles, which is a condition never before approached in this manufacture.

PROTECTING THE FABRIC FROM OXIDATION AND ROT.

Of nearly equal importance to the life of a tire is the prevention of its more readily perishable parts from coming in contact with destructive agents. Cotton is very prone to oxidation and rotting, especially when exposed to air and moisture, and particularly so when warm. To prevent this the cotton is protected by its rubber enclosure in a new tire. But in use the tire is continually exposed to abrasion and accidents of the road such as contact with sharp edges, which may cut into the fabric or cord foundation, and through such perforations may enter air, moisture, dirt and organic germs such as the spores of moulds. Dirt acts as an abrasive. Air with moisture brings about oxidation and the moulds as they grow in a moist warm atmosphere rot the cotton. Warmth is

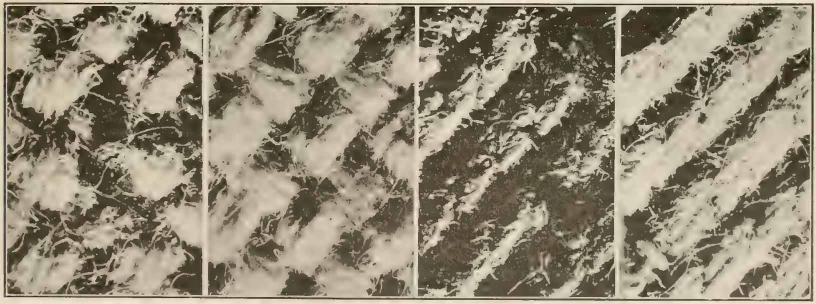


Fig. 2—Section of a Toron-Treated Fabric Tire. Fig. 3—Section of a Gray Goods Fabric Tire. Fig. 4—Section of a Toron-Treated Cord Tire. Fig. 5—Section of a Gray Goods Cord Tire.

Black Shows the Rubber. White Shows the Thread. Magnified 14 Diameters.

[1] Laboratory of W. B. Pratt, Inc., Boston, Massachusetts.

ensured by the heat generated through the friction of the tire in use. Moisture, either that left in the tire in manufacture or entering through punctures in the manner described, cannot be readily removed. Hence, though a structure built up on a cotton foundation and enclosed in rubber may be proof against oxidation and rotting from the action of the agents above enumerated, so long as it is enclosed in the rubber, yet it ceases to be thus protected as soon as the rubber covering is perforated or punctured.

It is otherwise, however, with toron-treated cotton, for every fiber is individually protected from contact with air, moisture or the effects of moulds. Neither moisture left in the tire structure by imperfections of manufacture or that which finds its way into the interior of the tire through perforations can reach the cotton through its envelope.

Another cause of rotting in tires is found in the sulphur coming from the vulcanized rubber. It is known that vulcanized rubber not infrequently shows a "bloom" due to some of the sulphur used for vulcanizing the rubber appearing on its surface, and through the oxidation of this sulphur in the presence of moisture and warmth, sulphur acids are formed which attack and weaken the cotton. Toron or toron-treated cotton does not bloom. Material treated with it reduces the likelihood of moisture, which might cause such oxidation of sulphur being left in the interior of the tire. And toron-treated cotton fiber is immune from attack from such sulphur acids as are formed within the tire.

VULCANIZING RUBBER TO SOLID TIRE RIMS.

An additional and very valuable characteristic of toron is that by its use rubber may be vulcanized to iron, thereby producing a complete adhesion of a solid tire to the rim of the wheel.

It is well known that rubber, whether vulcanized or not, does not adhere to iron and advantage is universally taken of this fact to vulcanize rubber articles in iron molds, yet, by a simple treatment of the rim surface with toron, on application of the rubber to this treated surface and its vulcanization, a bond is formed which resists rupture more than any other part of the tire, and thus one of the most serious defects in solid tire construction has been overcome.

NATIONAL ASSOCIATION OF WASTE MATERIAL DEALERS, STANDARD CLASSIFICATION FOR SCRAP RUBBER.

CIRCULAR F.

THIS STANDARD OF PACKING was adopted by the Scrap Rubber Division and approved by the Board of Directors of the Association on June 30, 1920, to be effective from July 1, 1920, to July 1, 1921, at which date a new circular will be issued.

All goods bought or sold under the following specifications are understood to consist only of domestic or Canadian manufacture, unless otherwise stipulated. All grades of scrap rubber shall be bought and paid for net weight, mill weights to govern, and no allowance for bagging or covering of any kind shall be made, nor shall the same be returned to the seller.

DELIVERY.

A.—All shipments of scrap rubber must be contained in bags, bales, bundles or other suitable containers, and if shipped loose a charge of ¼-cent per pound shall be made for extra handling, except automobile tires and railroad hose which may be shipped loose.

B.—A carload unless otherwise specified shall consist of fifteen tons.
A ton when applied to domestic stock shall mean 2,000 pounds.
A ton when applied to foreign stock shall mean 2,240 pounds.

C.—Shipments direct to a mill shall consist of not less than 2,000 pounds. Otherwise a charge of ¼-cent per pound shall be made.

D.—All scrap rubber of foreign manufacture shall be bought C. I. F. port of entry as per weight determined by sworn weigher's certificate, seller to bear expense of weighing, and shall be subject to same conditions as govern purchases of domestic manufacture.

REJECTIONS.

E.—Upon his request all rejections shall be returnable to the seller within thirty days from the time notice of rejection is received by him and upon payment by him of ½-cent per pound to cover cost of sorting and rebaling. If shipping instructions are not furnished within the above-mentioned thirty days the purchaser shall be at liberty to make such disposition of the material as he may see fit. The above does not apply if rejected material is purchased by the buyer.

F.—When shipments are made direct to a mill each grade of scrap rubber must be packed separately, and if not so packed a handling charge of ½-cent per pound will be made.

G.—All scrap rubber must be dry and free from dirt. All scrap received wet may be dried by the buyer, such shipments to be paid for on the dry weight as ascertained.

H.—A purchase contract shall not be considered filled until the full quantity within 2½ per cent, more or less, net weight, shall have been received, any rejections to be replaced within thirty days of the date of notice of rejection to the shipper.

EMBARGO.

I.—If through embargo a delivery cannot be made at the time specified the contract shall remain valid and shall be completed immediately on the lifting of the embargo, and terms of said contract shall not be changed. Notice of embargo must be served by seller.

CODE WORDS APPEAR IN ITALICS.

1.—Rubber Boots and Shoes (*Acre*). Deliveries of rubber boots and shoes must consist of black rubber boots and shoes only. They must be dry and clean, free from dirt and leather, and all metal excepting that applied by the manufacturer.

1.-(a)—Colored Rubber Boots and Shoes (*Auto*). Must consist of red, white and tan, and fancy colors, and must be packed and sold separately. The grading and packing to conform to Article 1.

2.—Trimmed Arctics (*Band*). Must be closely trimmed and free from leather and any composite non-rubber bearing material, such as fiber, inner soles, etc.

2.-(a)—Untrimmed Arctics (*Bird*). Must be free from leather and any composite non-rubber bearing material, such as fiber inner soles, etc.

3.—Trimmed Tennis Shoes (*Clam*). Must be black; closely trimmed; free from molded soles and leather, or any composite non-rubber bearing material such as fiber inner soles, etc.

3.-(a)—Untrimmed Tennis Shoes (*Cool*). Must be black and free from leather and molded soles or any composite non-rubber bearing material, such as fiber inner soles, etc.

4.—Mixed Standard Auto Tires (*Dirk*). Must be free from the following: unguaranteed tires; heavy beaded tires; non-pneumatic or filled tires. Must not contain any hard, oxidized, burnt, single tube, motorcycle, stripped or badly worn tires, nor tires containing leather or metal.

5.—Unguaranteed Auto Tires (*Earl*). Must be free from non-pneumatic or filled tires, heavy beaded tires, hard or oxidized, stripped, badly worn or tires with leather or metal.

6.—Badly Worn Auto Tires (*Farm*). Must be free from hard or oxidized, non-pneumatic or filled tires, heavy beaded tires and tires with leather or metal. A reasonable proportion of the tread must be on the tires.

7.—Stripped Auto Tires (*Game*). Must be free from hard or oxidized, non pneumatic or filled tires, heavy beaded tires and tires with leather or metal.

8.—No. 1 Auto Tire Peelings (*Hawk*) Must be free from cloth, metal and leather.

9.—No. 2 Auto Tire Peelings (*Iced*). Must consist of peelings from auto tire treads only, and must be free from leather, metal, stripped, auto tire fabric, also free from beadless auto tires and free from dykes and side walls.

10.—Bicycle Tires (*Jade*). Must be free from hard or oxidized tires and tires with wire and beads.

11.—Solid Wagon and Cab Tires (*Kite*). Must be free from metal, baby carriage and cushion tires.

12.—Solid Motor Truck Tires with Cloth (*Lamp*). Tires must be 2½ inches or over in diameter. Must be free from metal and tires with hard or fibre bases.

13.—Clean Solid Motor Truck Tires (*Life*). Must consist of tires over 2½ inches in diameter. Must be free of all metal, hard bases, fiber and cloth bases.

14.—Airbrake Hose (*Mask*). Must be free from metal, hard or oxidized hose and steam hose.

15.—Garden Hose (*Nail*). Must be ½-inch, or over, in diameter and free from metal, rags, rope and cotton-covered hose.

16.—Large Hose (*Over*). Large hose must be one inch or over in diameter. Must be free from metal, rags, rope, hard or oxidized hose and all cotton-covered hose.

17—Cotton-Covered Fire Hose. (*Park*). Must be rubber lined and free from hard or oxidized hose, and metal.

18.—No. 1 Auto Inner Tubes (*Quiz*). Must be strictly pure gum, live floating tubes, free from crusty tubes, cloth, metal, red and cloth patches, and free of black floating tubes.

19.—No. 2 Auto Inner Tubes (Known as Compound Tubes) (*Race*). Must be standard tubes, free from crusty tubes, cloth, metal, and cloth patches

20.—Red Auto Inner Tubes (*Utes*). Must be standard tubes, free from punchings, crusty tubes, cloth, metal and cloth patches.

21.—No. 1 White Rubber (*Vase*). Must consist of strictly clean white soft druggists' sundries and must be free from cloth and metal.

22.—No. 2 White Rubber (*Ward*). Must consist of white mechanical rubber and to be free from cloth, metal, crusty, hard or oxidized material, white soles and heels, jar rings and cement wringers.

23.—Mixed Black Rubber (*Yoke*). Must be free from cloth, metal, crusty, hard or oxidized material, packing, stripped matting, tiling, baby carriage tires, soles and heels.

24.—Matting and Packing (*Yarn*). Must be free from Garlock, Crandall, and piston packing, belting and similar material. metal and hard or oxidized stock.

25.—No. 1 Red Rubber (*Yeast*). Must consist of soft mechanical rubber. Must be free from maroon, chocolate, and other dark shades, also free from cloth and metal

26.—No. 2 Red Rubber (*Yawl*). Must be free from non-pneumatic or filled tires, heavy from jar rings, packing, hard or oxidized rubber, cloth, metal, soles and heels, and maroon and chocolate colored materials.

27.—Red Packing (*Zero*). Must be free from hard or oxidized rubber, cloth and metal and discolored rubber and free from graphite packing.

War Department Specifications for Mechanical Rubber Goods—III.[1]

War Department Specifications No. 333-1-1, frequently referred to in the following specifications, were published in The India Rubber World January 1, 1920.

RUBBER TRANSMISSION BELTING.

War Department Specification, No. 333-3-1—June 5, 1919.

(Authority of Supply Circular No. 8, P. S. & T. Div., January 24, 1919.)

General.—(*a*) This specification covers the requirements for friction surface rubber belting to be used for power transmission.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[2], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

Construction.—See General Specifications.

(*a*) Seam in outside ply shall be filled with a rubber cord or beading, fastened down with a rubber cover strip about one-half inch wide.

Branding.—See General Specifications.

(*a*) Use word "Transmission."

Material.—See General Specifications.

(*a*) Cotton duck shall weigh at least 27.4 ounces per square yard.

Inspection.—See General Specifications.

(*a*) Inspector shall cut sample 12 inches long from belts four inches or under in width, four inches long from belts above four inches in width, from each roll of belting.

Tests.—See General Specifications.

(*a*) Fabric.—The warp must show a tensile strength not less than 260 pounds and the filler 170 pounds.

(*b*) Friction.—The friction shall be determined by stripping off two plies and separating them at the rate of one inch per minute. Additional test specimens shall be used for the alternate plies until all plies are tested. The average of all plies to be considered the friction strength, which shall not be less than 18 pounds for belting four inches wide and over and 17 pounds for belts less than four inches wide.

BALATA BELTING.

War Department Specification, No. 333-3-2—June 5, 1919.

(Authority of Supply Circular No. 8, P. S. & T. Div., January 24, 1919.)

General.—(*a*) This specification covers the requirements for balata belting to be used for power transmission, elevator, and conveyor up to a temperature not exceeding 110 degrees F.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[2], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

Construction.—See General Specifications.

(*a*) The duck shall be thoroughly impregnated with balata.

Branding.—See General Specifications.

(*a*) Use the word "Balata." Brand with stencil.

Material.—See General Specifications.

(*a*) Cotton duck shall weigh not less than 29 ounces per square yard and have not less than 8-ply warp yarn and 5-ply filling yarn.

(*b*) The impregnating material shall be chemically neutral in character, permanently pliable, and free from any substance injurious to the untreated fabric, and unaffected by exposure to atmospheric conditions and water.

Inspection.—See General Specifications.

(*a*) Inspector shall cut off sample 12 inches long from belts four inches or under in width, four inches long from belts above four inches in width, from each roll of belting.

Tests.—See General Specifications.

Fabric.—(*a*) The untreated duck shall have a tensile strength of at least 250 pounds in the warp and 200 pounds in the filling.

(*b*) The adhesion between the plies of fabric shall be determined by separating two plies at a time at the rate of one inch per minute. Additional test specimens shall be used for the alternate plies until all plies are tested. The average of all plies to be considered the adhesion strength, which shall be at least 12 pounds.

CORRUGATED TENDER HOSE.

War Department Specification, No. 333-1-13—June 5, 1919.

(Authority of Supply Circular No. 8, P. S. & T. Div., January 24, 1919.)

General.—(*a*) This specification covers the requirements for hose for conducting water between tender and locomotive.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[2], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

Construction.—See General Specifications.

(*a*) Dimensions to conform with the following table.

(*b*) Made of an inner rubber tube; two plies of duck; a coil of galvanized or copperized wire extending within three inches of end of hose and thoroughly embedded in at least a 1/32-inch layer of rubber of same compound as tube; two plies of duck; and an outer rubber cover.

Branding.—See General Specifications.

(*a*) Use word "Tender."

Material.—See General Specifications and following table.

(*a*) Tube and friction shall be made of a rubber compound best adapted to resist the continued action of hot water and steam; the cover to resist water; abrasion, and other mechanical injuries.

Inspection.—See General Specifications.

(*a*) Inspector may select at random for tests one length from each and every shipment of 100 lengths or less. Tests shall be performed on samples taken from soft ends.

(*b*) If samples corresponding to any one lot fail to meet the requirements, the contracting officer may reject that lot or may, with the consent of the contractor, accept part or all of it at not more than 75 per cent of the contract price: Provided, however, that it does not fall below by more than 10 per cent of the requirements.

Tests.—See General Specifications and following table.

Table.

	Size		
	2½ Inches	3 Inches	3½ Inches
Tolerance, inside diameter, plus or minus........inch	1/32	1/32	1/32
Outside diameter	3¼	3¾	4¼
Tolerance, outside diameter, plus or minus	1/16	1/16	1/16
Length, as specified in proposal.			
Length, tolerance, plus or minus	½	½	½
Thickness, tube and cover, minimum	1/16	1/16	1/16
Duck, plies, minimum	4	4	4
Weight (square yards), minimum..........ounces	18	18	18
Wire diameter..........inches	0.120	0.120	0.120
Spacing maximum	¾	¾	¾
Thickness of rubber liner, minimum	1/32	1/32	/132
Friction, minimum..........pounds	15	15	15
Tensile:			
Tube, minimum	500	500	500
Cover, minimum	450	450	450
Ultimate elongation, tube and cover, minimum..inches	2-6	2-6	2-6

RADIATOR HOSE.

War Department Specification, No. 333-1-9—June 5, 1919.

(Authority of Supply Circular No. 8, P. S. & T. Div., January 24, 1919.)

General.—(*a*) This specification covers the requirements for hose to be used between radiator and engine.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[2], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

Construction.—See General Specifications.

(*a*) Dimensions to conform with the following table.

(*b*) No couplings.

Branding.—See General Specifications.

(*a*) Use word "Radiator."

Material.—See General Specifications and following table.

(*a*) Tube and friction shall be composed of a steam-resisting compound; cover of an oil-resisting compound.

Inspection.—See General Specifications.

(*a*) Inspector may select at random four 3-foot sections from each and every shipment of 2,000 feet or less. Two samples to be used for steaming, two for oil tests.

Tests.—See General Specifications and following table.

(*a*) Test specimens shall not be buffed.

(*b*) In calculating the tensile strength after steaming and oil tests, the thickness of test specimen shall be considered as equal to that of the original test specimens.

(*c*) Steaming.—Steam at 45 pounds pressure to be passed through a 2-foot section for eight hours. (Hose to be provided with open drain cocks to prevent filling with condensation.)

[1]Continued from The India Rubber World, July 1, 1920, pages 649-651.
[2]See The India Rubber World, January 1, 1920, page 214.

(*d*) OIL.—One-foot section, with both ends plugged, shall be immersed for 48 hours in medium gas engine cylinder oil between 70 degrees and 80 degrees F. and immediately wiped clean before resting. Test pieces to be cut at least four inches from either end.

TABLE.

	Size, as Specified.
Thickness:	
Tube, minimum ... inch	1/16
Cover, minimum ...	3/64
Tensile:	
Original tube and cover, minimum ... pounds	600
After steaming tube, minimum ...	400
After immersed in oil, cover, minimum ...	400
Ultimate elongation:	
Original tube and cover, minimum ... inches	2-6
After steaming tube, minimum ...	2-5
After immersed in oil, cover, minimum ...	2-5
Friction:	
Before steaming, minimum ... pounds	15
After steaming, minimum ...	10
Fabric:	
Weight per square yard, minimum ... ounces	10.8
Number of plies 2 inches and under, minimum ...	3
Number of plies over 2 inches, minimum ...	4

DIVERS' HOSE.

War Department Specification, No. 333-1-6—June 5, 1919.

(AUTHORITY OF SUPPLY CIRCULAR NO 8, P S. & T. DIV., JANUARY 24, 1919.)

GENERAL.—(*a*) This specification covers the requirements for hose to be used for conducting air in diving apparatus.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[2], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(*a*) The cotton reinforcement shall consist of three braided layers, well embedded in the rubber compound to meet all tests described below.

(*b*) Dimensions to conform with the following table.

(*c*) The washers shall be of leather, 1/16-inch in thickness.

(*d*) Each length shall have a rubber cap at least 1/16-inch thick.

BRANDING.—See General Specifications.

(*a*) Use the word "Divers."

MATERIAL.—See General Specifications.

(*a*) Tube and cover shall contain not less than 30 per cent fine Pará rubber, not more than 2½ per cent sulphur, nor more than 1½ per cent waxy hydrocarbon, with the remainder suitable dry, inorganic mineral fillers.

INSPECTION.—See General Specifications.

(*a*) The inspector shall cut a 3-foot section from one length out of every lot of ten (50-foot lengths) or less; or take one in every 50 short lengths for test.

(*b*) For each lot of fifty 3-foot lengths one extra length shall be furnished for test purposes.

TESTS.—See General Specifications.

(*a*) To conform with the following table.

(*b*) Constricted part of test specimen shall be ¼ by two inches.

	Size, ½-inch.
O. D. lengths ...	1 1/16 inches, 3 or 50 feet.
Hydrostatic for couplings ...	250 pounds for 10 minutes.
Tests: burst ...	1,000 pounds.
Friction ...	20 pounds.
Tensile:	
Tube ...	1,200 pounds.
Cover ...	1,000 pounds.
Ultimate elongation:	
Tube ...	2 to 9 inches.
Cover ...	2 to 9 inches.
Stretch ...	2 to 7 inches.
Set ...	25 per cent (maximum).
Tolerance, plus or minus ...	1/32-inch.

CHEMICAL ENGINE HOSE.

War Department Specification, No. 333-1-5—June 5, 1919.

(AUTHORITY OF SUPPLY CIRCULAR NO 8, P. S. & T. DIV., JANUARY 24, 1919.)

GENERAL.—(*a*) This specification covers the requirements for chemical engine hose for use with hand chemical fire extinguishers, and chemical engines.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[2], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(*a*) Dimensions to conform with the following table.

BRANDING.—See General Specifications.

(*a*) Branding to be black.

(*b*) Use the word "Chemical."

MATERIAL.—See General Specifications.

(*a*) Tube, cover, washers, and friction shall contain not less than 35 per cent fine Pará and not more than 3 per cent sulphur; the remainder to consist of suitable dry inorganic mineral fillers. The use of carbonates will not be permitted.

(*b*) Cover shall be red.

INSPECTION.—See General Specifications.

TESTS.—See General Specifications and following table.

(*a*) Test pieces of tube and cover shall be subjected to an accelerated aging test of 96 hours in dry heat at 158 degrees F., plus or minus 2 degrees.

TABLE.

	Size			
	⅜-Inch.	½-Inch.	¾-Inch	1-Inch.
Tolerance (I. D.), plus or minus .inch	1/64	1/64	1/64	1/64
Thickness.				
Tube, minimum ...	1/16	1/16	1/16	1/16
Cover, minimum ...	1/32	1/32	3/64	3/64
Hydrostatic test:				
Coupling, minimum ... pounds	150	150	150	150
Burst, minimum ...	500	500	500	500
Friction ...	15	15	15	15
Tensile:				
Tube, minimum ...	1,500	1,500	1,500	1,500
Cover, minimum ...	1,300	1,300	1,300	1,300
After aging:				
Tube, minimum ...	900	900	900	900
Cover, minimum ...	800	800	800	800
Ultimate elongation, minimum .inches	2-11	2-11	2-11	2-11
Permanent set:				
Tube and cover, stretch for 10 minutes, then release, minimum inches ...	2-10	2-10	2-10	2-10
Per cent set after 10 minute rest, maximum ...	25	25	25	25

GAS HOSE.

(A) ACETYLENE-HYDROGEN HOSE. (B) OXYGEN HOSE.

War Department Specification, No. 333-1-2—June 5, 1919.

(AUTHORITY OF SUPPLY CIRCULAR NO. 8, P. S. & T. DIV., JANUARY 24, 1919.)

GENERAL.—(*a*) This specification covers the requirements for hose to be used in carrying acetylene, oxygen, and hydrogen gas.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[2], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

(*a*) DIMENSIONS.—See the following table.

(*b*) Rubber cover shall be red for acetylene-hydrogen hose; black for oxygen hose.

BRANDING.—See General Specifications.

(*a*) The red covered hose shall have black brands.

(*b*) For acetylene-hydrogen hose use the letters "ACET-HYD;" for oxygen the letters "OXY."

MATERIAL.—See General Specifications.

(*a*) The fabric plies shall be of sheeting or a plain weave fabric.

INSPECTION.—See General Specifications.

TESTS.—See General Specifications and following table.

TABLE.

Size ... Inches	5/16, plus or minus 1/64
Outside diameter ...	⅝, plus or minus 1/32
Thickness:	
Cover ...	3/64-1/16
Tensile:	
Tube, minimum ... pounds	500
Cover, minimum ...	450
Ultimate elongation:	
Tube and cover, minimum ... inches	2-6
Friction minimum ... pounds	9
Hydrostatic:	
Coupling, minimum ...	250
Burst, minimum ...	500

DREDGING SLEEVES.

War Department Specification, No. 333-1-4—June 5, 1919.

(AUTHORITY OF SUPPLY CIRCULAR NO. 8. P S. & T. DIV., JANUARY 24, 1919.)

GENERAL.—(*a*) This specification covers the requirements for dredging sleeves to be used on hydraulic dredges.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[2], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(*a*) Sleeves shall consist of a rubber tube, cotton canvas layers, and rubber cover.

(*b*) Between the center plies there shall be a 1/32-inch layer of rubber compound. See General Specification.

(*c*) Ends to be capped with same rubber compound as in the tube.

[2]See THE INDIA RUBBER WORLD, January 1, 1920, page 214.

(*d*) Over the rubber cover for a distance of six inches from each end there shall be vulcanized a strip of duck same as that used in canvas layers.

(*e*) Dimensions.—See the following table.

Branding.—See General Specifications.

(*a*) Use words "Dredging Sleeves."

Material.—See General Specifications.

(*a*) Cotton canvas layers shall be made from duck weighing not less than 30 ounces per square yard and containing not less than 13 nor more than 20 yarns per inch each in warp and filling.

Inspection.—See General Specifications.

(*a*) With each lot of 10 sleeves or less the manufacturer shall provide the inspector for test a sample 1½ inches wide of same material and construction, made up with the sleeve, at one end, but detached so as not to impair the finished sleeve. Manufacturer shall submit one lineal foot of unfrictioned duck with each order.

(*b*) If samples corresponding to any one lot of sleeves fail to meet the tests, the contracting officer may reject the lot or may, with the consent of the contractor, accept part or all of it at not more than 75 per cent of the contract price, provided, however, that it does not fall below by more than 10 per cent of the test.

Tests.—See General Specifications and following table.

(*a*) Test specimens of tube shall be buffed down to approximately ⅛-inch.

Table.

Size and Length, as Specified in Proposal.	
Tolerances:	
Diameters, plus or minus ... *inches*	⅛
Length, plus or minus ...	½
Thicknesses:	
Tube, minimum ...	3/16
Cover ...	3/32
Cap ...	¼
Rubber layer between center plies, minimum ...	1/32
Fabric, per square yard ... *ounces*	30
Plies, as specified in proposal.	
Tensile, minimum—	
Warp ... *pounds*	250
Filling ...	250
Friction ...	18
Tensile:	
Tube ...	1,500
Cover ...	1,300
Ultimate elongation	
Tube ... *inches*	2-12
Cover ...	2-12
Permanent set.	
Stretch for 10 minutes then release.	
Tube ...	2-10
Cover ...	2-10
Per cent set after 10 minutes rest:	
Tube ... *maximum*	25
Cover ...	25

RED SHEET PACKING.

War Department Specification, No. 333-2-3—June 5, 1919.

(Authority of Supply Circular No. 8, P. S. & T. Div., January 24, 1919.)

General.—(*a*) This specification covers the requirements for red sheet packing to be used in joints in connection with cold water, hot water, and steam up to and including 150 pounds pressure.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[2], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

Construction.—See General Specifications.

(*a*) Packing shall be in rolls about 36 inches wide, approximately 125 pounds in weight and of thickness specified.

Branding.—See General Specifications.

(*a*) Use the words "Red Sheet."

Materials.—See General Specifications.

(*a*) Packing shall be of a specific gravity not less than 1.8 nor more than 2.2, which is equivalent to not less than 2.65 pounds nor more than 3.23 pounds per square yard for each 1/32-inch of thickness.

Inspection.—See General Specifications.

Tests.—See General Specifications.

(*a*) Tensile specimens may be taken in any direction.

(*b*) Tensile strength, minimum, 500 pounds.
Ultimate elongation, minimum, two to four inches.
Ultimate elongation, maximum, two to seven inches.

(*c*) Packing shall not crack when bent double in any direction.

(*d*) A section of packing shall be cut in the form of a gasket such that it will entirely cover the seat of a 2-inch flange of an autoclave. A steel plate the size of the flange shall then be securely clamped over the gasket. It shall then be exposed to a steam pressure of 250 pounds per square inch for four hours. After the sample has been removed from the flange of the autoclave it shall be allowed to cool for one hour, after which packing under 1/8-inch thick shall not crack if bent double in any direction and packing 1/8-inch and over in thickness shall not crack if bent around a 1/2-inch round mandrel.

TUCK'S PACKING.

War Department Specification, No. 333-2-4—June 5, 1919.

(Authority of Supply Circular No. 8, P. S. & T. Div., January 24, 1919.)

General.—(*a*) This packing is to be used as stuffing-box backing on pistons in pumps and engines.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[2], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

Construction.—See General Specifications.

(*a*) Tuck's packing shall consist of frictioned cotton canvas layers either round or square, as specified. The round packing shall be made with a rubber core, unless otherwise specified.

(*b*) It shall be built up on the bias and shall conform in dimensions, plies, and textures to the following table:

Sizes.	¼ to ⅜-inch.	½ to ⅞-inch.	1 inch and over.
Texture of plies ...	Fine ...	Medium ...	Coarse
Number of plies per inch, including friction ...	38 to 42 ...	26 to 30 ...	15 to 17.

(*c*) The rubber core shall have a diameter equal to one-third the diameter of packing.

Branding.—Not required.

Materials.—See General Specifications.

(*a*) The rubber core shall contain not less than 35 per cent fine Pará rubber; not more than three per cent sulphur, and the remainder shall consist of suitable dry inorganic mineral fillers.

(*b*) Friction shall be of such a compound as to meet required tests.

Inspection.—See General Specifications.

(*a*) A section six inches long shall be cut from any length at any place to allow for four or more tests.

Tests.—See General Specifications.

(*a*) The completed article shall withstand boiling in water under 80 pounds' steam pressure for four hours without loosening the friction or materially hardening the rubber.

(*b*) Packing shall be sufficiently flexible to admit of bending easily around rods or pistons of various sizes. The 1/4 to 3/4-inch shall bend around its diameter, the 7/8 to 1 1/8-inch around twice its diameter, and the larger sizes around three times their diameter.

(*c*) Friction shall be such that a weight of 8 pounds shall not cause a separation greater than 1 inch per minute, calculated upon a basis of a 1-inch specimen.

(*d*) Tensile strength of the rubber core shall be at least 900 pounds per square inch, and it shall have an elongation at the breaking point of at least two to eight inches.

DIAPHRAGM PACKING.

War Department Specification, No. 333-2-2—June 5, 1919.

(Authority of Supply Circular No. 8, P. S. & T. Div., January 24, 1919.)

General.—(*a*) This packing is to be used for making diaphragms for diaphragm pumps.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[2], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

Construction.—See General Specifications.

(*a*) The packing shall be in sheets approximately 36 inches wide and made into rolls of about 125 pounds each. It shall be constructed of two layers of cotton fabric using a layer of rubber between them and a layer of rubber on each side, making alternate layers of rubber and fabric.

The rubber layer which separates the plies of duck shall be 1/16-inch thick. The outer rubber layers shall be equal in thickness, but of such a thickness to make the total thickness of the packing 1/4-inch.

(*b*) The cotton canvas plies shall be frictioned on both sides with the same quality material as used in the rubber compound and shall withstand the friction test mentioned below.

Branding.—See General Specifications.

(*a*) Use the word "Diaphragm."

[2]See The India Rubber World, January 1, 1920, page 214.

MATERIAL.—See General Specifications.

(*a*) Fabric shall weigh not less than 12 ounces per square yard.

(*b*) The rubber compound shall contain not less than 40 per cent of fine Pará; not more than 3 1/2 per cent sulphur; remainder to be suitable dry inorganic mineral fillers.

INSPECTION.—See General Specifications.

TESTS.—See General Specifications.

(*a*) Fabric:	
Tensile, minimum	
Warp	125 pounds.
Filling	125 pounds
Yards per inch each, warp and filling	22, plus or minus 4
(*b*) Friction, minimum	14 pounds.
(*c*) Tensile rubber layers, minimum	1,800 pounds.
(*d*) Ultimate elongation, minimum	2 to 11 inches.
(*e*) Permanent set	
Stretch for 10 minutes, minimum	2 to 9 inches.
Set after 10 minutes' rest, maximum	25 per cent

CLOTH INSERTION RUBBER PACKING.

War Department Specification, No. 333-2-1—June 5, 1919.

(AUTHORITY OF SUPPLY CIRCULAR NO. 8, P. S. & T. DIV., JANUARY 24, 1919.)

GENERAL.—(*a*) This specification covers requirements for grade I packing used in flanges of ventilation systems or in flanges in contact with cold water which are separated only at long intervals; grade II packing used in flanges in contact with cold water which are separated frequently.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[2], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(*a*) To consist of alternate layers of rubber and cotton sheeting or a plain weave fabric in such a manner that both faces of packing shall be of rubber.

(*b*) Made about 36 inches wide, and in rolls weighing approximately 125 pounds, unless otherwise specified.

(*c*) Cotton insertion shall be properly frictioned with a composition to meet required tests.

(*d*) For every 1/16-inch thickness there shall be at least one ply of cotton sheeting or a plain weave fabric.

(*e*) 1/32-inch packing shall have only one ply of insertion and shall be furnished in grade II only. Grade I shall be furnished in thickness 1/16-inch and above.

BRANDING.—See General Specifications.

(*a*) Use the words "Water, Grade I" or "Water, Grade II," as specified in proposal.

MATERIALS.—See General Specifications.

(*a*) Fabric to weigh not less than 4.75 ounces nor more than 5.15 ounces per square yard, count to be 35 to 50 threads per inch for both warp and filling directions.

(*b*) All rubber layers to be of the same composition.

INSPECTION.—See General Specifications.

TESTS.—See General Specifications.

(*a*) GRADE I:

Friction adhesion between rubber layers and fabric insertions, minimum ... *pounds*	7
Tensile of rubber layers, minimum	1,000
Ultimate elongation, minimum ... *inches*	2-11
Permanent set:	
Stretch for 10 minutes, minimum	2-10
Set after 10 minutes' rest, maximum ... *per cent*	20

(*b*) GRADE II.—One-sixteenth-inch complete packing shall weigh not less than five or more than six pounds per square yard, and other thicknesses in same proportion. Packing weighing over six pounds per square yard may be rejected, or accepted with payments based on area corresponding to 6 pounds per square yard.

Shall be pliable enough to stand bending double in any direction without cracking.

A 4-inch square of packing shall be placed in the water of an autoclave. Another section shall be placed on flange of autoclave with steel plate clamped on so as to cover the entire pieces of packing. The autoclave shall be heated to give an internal steam pressure of 50 pounds per square inch for four hours. Both sections shall be allowed to rest one hour after removing from autoclave, after which they shall show no blisters or other apparent injury. Packing under 1/8-inch thick shall not crack when bent double; packing 1/8-inch and over in thickness shall not crack when bent around 1/4-inch round mandrel.

RUBBER VALVES.

War Department Specification, No. 335-1-2—June 5, 1919.

(AUTHORITY OF SUPPLY CIRCULAR NO. 8, P. S. & T. DIV., JANUARY 24, 1919.)

GENERAL.—(*a*) This specification covers the requirements for valves used in pumps, condensers, etc.

[2]See THE INDIA RUBBER WORLD, January 1, 1920, page 214.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[2], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(*a*) The valve surfaces shall be smooth and free from pitting, air checks, other imperfections, and properly finished. They shall be hard, medium, and soft, as required.

BRANDING.—See General Specifications.

(*a*) Valves shall be molded with the words "U. S. A.," "Hard," "Medium," or "Soft," manufacturer's name, and date on edge of valve.

MATERIAL.—See General Specifications.

(*a*) Valves shall be made from a compound containing fine Pará rubber, sulphur, and suitable dry inorganic fillers, as specified in table below:

	Minimum percentage fine Pará.	Total sulphur.	Specific gravity. Minimum.	Specific gravity. Maximum.
Hard	30	10	1.7	1.9
Medium	35	5	1.4	1.8
Soft	35	2.5	1.6	1.8

INSPECTION.—See General Specifications.

(*a*) Inspector shall select one valve from every lot for tests.

TESTS.—See General Specifications.

(*a*) Half a valve taken at random from the lot shall stand a dry-heat test 270 degrees F. for one hour; the other half from same valve shall stand a dry saturated steam test of 400 degrees F. for three hours. The valves shall not disintegrate nor blister in either of the above tests.

SOLIDS PLUS PNEUMATICS.

Commenting on a caption of frequent occurrence in motor papers, F. R. Fageol, of the Fageol Motors Co., Oakland, California, asserts in "Automotive Industries" that it should read "Solids Plus Pneumatics" rather than "Solids vs. Pneumatics." Pointing out that both types of tires have their own peculiar functions, and that both are undoubtedly here to stay, he very aptly asserts that pneumatic tires will not run solids out of business, but will simply run trucks into more business. At present and apparently for some time to come pneumatics can no more displace solids than can trains displace boats.

From the truck manufacturer's point of view, pneumatics merely extend the range of truck transportation beyond the field developed on solids. Most tire manufacturers produce both types. Thus there are occasions for comparison, but very little conflict.

For slow-moving heavy loads in congested traffic, it is hard to conceive anything more satisfactory than the solid rubber truck tire, but it will not withstand long continuous use at high speed as do pneumatics. In the past there was no need of speed in trucking, and neither trucks nor roads were built for it. With lagging transportation facilities now the most serious problem before the world, however, the efficiency of all known transportation agencies must be increased, and neither truck load nor road will withstand the shocks and vibration of high speed unless cushioned by pneumatics.

Roads are being built to meet present-day needs, and pneumatic cord tires have enabled truck manufacturers to develop transmissions and other improvements to increase speed and economical hauling radius. The modern seven-speed truck transmission, for example, gives an over-drive for speed of thirty miles an hour on the open road, together with an extremely low reduction for steep grades on unusually heavy going. Pneumatic tires also afford traction under certain unfavorable conditions that render truck operation on solids very difficult. Sand, loose dirt, and mud seem to hold no terrors for the pneumatic.

Many claims of savings in operation costs, such as fuel consumption and general repairs when pneumatics replace solids, are being made, but these are entirely beside the point. Pneumatics do increase the usefulness of the motor truck and that is the real issue. They do not supplant solids, but bring into truck range an entirely new class of business heretofore necessarily handled by some less satisfactory means.

What the Rubber Chemists Are Doing.

THE COLLOIDAL VIEWPOINT OF RUBBER CHEMISTRY.[1]

THIS PAPER is divided into two main topics. The first is an analysis of the mechanism by which the particles increase or decrease in size in rubber and other colloidal systems. Under this head crystallization, condensation, polymerization and coagulation will be discussed. The second topic is concerned with some applications of selective adsorption to rubber.

CRYSTALLIZATION.

For the present purpose little need be said of the process known as crystallization except with regard to a single phase of this phenomenon. For instance, when very dilute solutions of gold chloride are treated with weak reducing agents, microscopic nuclei are formed from which colloidal crystals of gold may be made to grow, if the reducing action is kept sufficiently low, so that the molecules of gold have time to become orientated on the crystal faces. Here the growth of the particles occurs by a purely crystallization process, and will cease as soon as the supply of molecular gold or reducing agent is exhausted.

CONDENSATION.

The term condensation is often employed in a somewhat loose sense. Strictly speaking it refers to an increase in the size of the particles through the agency of a chemical change, whereby two or more molecules unite by the splitting off of water or other substance. A classical example is the formation of starch from sugar according to the equation

$$n\ C_6H_{12}\ O_6 \longrightarrow (C_6H_{10}\ O_5)_n + nH_2O$$

POLYMERIZATION.

Polymerization is another well-known method involving the growth of particles. This phenomenon differs from condensation only by the fact that nothing is split off when two or more molecules unite to form a larger complex. The molecular weight of the complex is, therefore, n times that of the original substance if n represents the number of molecules that have united to form the new and larger unit. Organic chemistry is replete with examples of this kind of chemical action. For instance the change of the aldehydes into the para or meta modifications belongs in this category. From the evidence at hand it seems very probable that in polymerization the redistribution of major valencies is involved, because those substances which exhibit this property to a pronounced degree are possessed of double bonds.

It should be emphasized in connection with a discussion of condensation and polymerization that these two types of changes are essentially chemical in the strictest sense of the term. The products of these two reactions have properties very different from the original, and the alterations of properties are sudden, not gradual.

COAGULATION.

Coagulation, in contradistinction to condensation or polymerization, involves a gradual change of properties and there is no sharp line of demarcation between the original and the final substance. Unfortunately, the term is employed to designate four distinctly different physical processes.

The first of these is well illustrated by the union of the colloidal gold crystals referred to in a previous paragraph. If during the growth of these tiny crystals the process is hurried, or if an electrolyte is added to the colloidal solution, several of the tiny crystals unite by surface contact, a loose mass is formed and eventually a powder will be precipitated. This is, of course, an irreversible process and is a typical example of coagulation. It should be noted, however, that the particles touch the surface of one another and do not flow together.

A second form of coagulation is manifested when, for example, the particles of an oil-in-water system gather together. Here the tiny droplets touch one another, flow into a larger drop which finally rises to the top or sinks to the bottom, according to the differences in the specific gravity of the two phases. This kind of coagulation is distinguished from all others in that the resulting products are two distinct, molecularly dispersed and therefore homogeneous phases. There is no colloidal oil dispersed in the water, nor yet is there any colloidal water in the oil.

A third type is exemplified by the coagulation of gelatin in a hydrosol by an excess of an electrolyte, whereby a flocculent and perhaps a somewhat stringy mass is obtained. It is conceded by most writers that the electrolyte to a large extent desolvates the gelatin, that the particles are at first actually reduced in size because of the loss of solvent, but that the desolvated particles unite to form larger clumps which appear as flocks.

There is also another possibility that should not be overlooked. Not only may the particles unite and flow together, but the molecules of which these particles are composed may unite chemically to some extent and form a polymerized substance. In such a case we should have both a chemical and physical reaction going on simultaneously or subsequently to each other. It is altogether probable that in the coagulation of rubber latex where an elastic mass is formed, there occurs both a physical union between the particles and polymerization between the molecules in these particles. It is quite conceivable that these two reactions might proceed to a different degree in the same system under slightly different conditions. If this were true we should not expect the two products to have identical properties. This may explain why two samples of raw rubber from the same latex may differ materially from each other if the conditions during coagulation are varied in the two cases.

GELATION.

A fourth physical change, that of gelation, is usually referred to as coagulation. When a sufficiently concentrated solution of gelatin in water is allowed to cool the entire mass sets as a gel. The process in this case is the reverse of number three previously described. As the cooling proceeds the particles become more and more solvated, the size of the particles increases until they touch one another and the gelatin eventually forms the continuous phase, while the water is now dispersed in the gelatin. This phenomenon is known as a reversal of phase. Gels may be formed by evaporating off the solvent, and here the same reversal of phase may occur. It is also not impossible that polymerization may take place during the formation of a gel by either of these processes.

CHARACTERISTICS OF GELATION.

Gelation differs from the three previously mentioned forms of coagulation because in a gel both the disperse phase and the disperse medium are coextensive throughout the entire mass. This expression is employed in preference to the term homogeneous because the latter has a well-defined thermodynamic meaning. Homogeneous solutions contain a solute in a molecular state of subdivision and exhibit a lowering of the freezing point or raising of the boiling point from which molecular weights may be calculated. Gels are coextensive

[1]Published by courtesy of the American Chemical Society. Paper by Ellwood B. Spear, chemical department, Massachusetts Institute of Technology, read at the St. Louis meeting, April, 1920.

in the sense that every submicroscopic portion contains both the solute and the solvent.

Caoutchouc dissolved in benzol may be separated from the solvent either by the addition of acetone or by the evaporation of the benzol. In the first case a lumpy, stringy mass is obtained, doubtless because the acetone desolvates the raw rubber. In other words, the acetone robs the caoutchouc of its benzol, the particles are attracted to one another and therefore coagulate in masses or flocks. When, however, the benzol is removed slowly by evaporation the particles are forced closer and closer together as desolvation proceeds. Finally they touch, flow into one another and a single coextensive mass is formed. Just as in the case of gelatin, it is quite possible that polymerization occurs during the coagulation.

In accordance with this point of view an elastic rubber mass is a coagulum permeated with capillaries, the walls of which are made up of more or less polymerized particles of different sizes stuck together at several portions of their surfaces. If a solvent is introduced the particles become solvated and separate into submicrons that differ greatly in size. Moreover, if polymerization occurs during coagulation it naturally follows that depolymerization must take place while dissolution is in progress.

This same increase in dispersion and possibly depolymerization may be brought about by other agencies than solvents. Mechanical work and rise of temperature have this effect to a marked degree. Doubtless the function of "milling" is precisely of this nature, but whether the paramount change is chemical depolymerization or merely a physical reduction in the size of the particles cannot be decided at present. It seems very probable that both occur at the same time. It is of interest to note in this connection that a tire on the road is being constantly subjected to a milling treatment which should tend to depolymerize and decrease the size of the particles. This effect should be offset wholly or in part by a slow vulcanization in case free sulphur is present, because the temperature rise in a tire under load is often very considerable.

The subject of coagulation and the antithesis, dispersion, should not be dismissed without reference to the important part these reactions play in the preparation of such compounding materials as zinc oxide, gas black and sublimed lead. A recent article on carbon black by Perrott and Thiessen,[2] makes it quite clear that not only the size of the particles but also the structure is vital. Both of these are without doubt influenced by the method of preparation.

SELECTIVE ADSORPTION.

Selective adsorption, the second topic of this paper, is a colloidal conception that promises to become more and more useful as it is better understood. By the term is meant that certain substances mutually attract each other with very considerable force, although no chemical action according to the law of definite proportions may result. When the substances are microscopic in size this attraction is called adhesion, but if one or both are of colloidal dimensions the term adsorption is applied. May it not be that this phenomenon is the vital factor in the compounding of rubber? Certainly on purely chemical grounds we cannot account for the very great change of properties occasioned by the mixing of gas black with raw rubber, nor yet for the fact that oil black is not so efficacious as gas black. Selective adsorption, on the other hand, predicts very pronounced differences of behavior between substances having the identical chemical composition but a different physical structure. In order that carbon black may be adsorbed by raw rubber to the greatest degree and with the strongest bonds, the former must be in a very fine state of division, and doubtless the particles must have a particular structure. These conditions are not met so well by the oil black as they are by the gas black.

This theory also predicts other important facts familiar to the rubber chemist. For example, it ought to be possible to substitute for carbon other substances which are in a suitable physical state. The determining factor is whether or not the compounding material and rubber mutually adsorb each other to a high degree. This is doubtless the reason that zinc oxide may be employed instead of gas black.

Many other systems are known where mutual adsorption changes the properties fundamentally. As an instance may be cited a mixture of sand and mud, or clay. Roads made of either of these materials alone are nearly impassable, but if the two are mixed in the right proportions very fair surfaces result.

CONCLUSION.

From the colloidal point of view the particles of the compounding material of a compounded vulcanized rubber mass are surrounded by a thin film of rubber. The latter is therefore the continuous phase and is held securely to the surface of the compounding material by the forces of adsorption. Not only will the rubber films offer resistance to efforts tending to deform the mass, but the particles of the compounding material hold the films of the rubber so firmly that the resistance is greatly increased. A good example of this last action is shown by the surfaces of two glass plates which have been wet and brought together. As long as the plates are not very close they can be moved across each other with ease. When, however, the surfaces are pressed together so that the water forms a thin film between them, the adsorption forces become so strong that the plates may be moved in different directions only with great difficulty.

CARBON BLACK.

The following interesting facts are taken from an address delivered before the National Association of Printing Ink Manufacturers by Godfrey L. Cabot, a well-known manufacturer of carbon black.

PRODUCTION.

The makers of carbon black are straining every nerve and have been making the utmost effort for several years to increase their output, and it has greatly increased. In 1915 The B. F. Goodrich Co. made the remarkable discovery that carbon black incorporated in rubber increased its tensile strength fifteenfold, giving it greater tractile effect on a smooth and slippery pavement, less wear and afforded greater resistence to the oxidizing effect of the atmosphere than any other material yet tried for these purposes. The result was that the demand for carbon black increased more than twofold, and more than half the carbon black now made is used in the rubber trade, and the amount available is not enough to satisfy it.

Many different causes have increased the difficulties of supplying the demand for carbon black. During the war pressure was brought to bear by the Fuel Administration to divert gas from its use in the manufacture of carbon black to use for fuel, and two factories have been shut down in part by this pressure.

The great scarcity of steel, its high price and the difficulties of transportation have greatly enhanced the expense and difficulty of building black factories, and it is difficult, expensive and tedious to get such material to-day.

Many of you have probably noticed old signs on country roads that had been painted in black on a background of white lead, and this in turn on a wooden board—the white lead almost gone, the wood beneath it rotted away to a very appreciable extent, and the black lettering of the original sign standing out in bas relief by reason of its having protected the

[2] "Journal of Industrial and Engineering Chemistry," xii, 324 (1920); THE INDIA RUBBER WORLD, June 1, 1920, 581,582.

wood beneath it by prolonging the life of the oil with which it was mixed.

CARBON BLACK RETARDS OXIDATION.

The process of the drying of linseed oil and other drying oils is due to oxidation and is accompanied by an increase in weight. This oxidation process is more retarded by carbon black than by any other known pigment. Next to it comes lampblack, but carbon black retards the drying of paint even more than lampblack by retarding the oxidation of the oil. It seems to have a similar effect on retarding the oxidation and consequent deterioration of rubber.

INCREASES TENSILE STRENGTH OF RUBBER.

Samples of rubber compounded with carbon black have shown a tensile strength of 3,700 pounds per square inch.

COMPOSITION OF CARBON BLACK.

Carbon black is not carbon, and all analyses showing over 99 per cent of carbon in carbon black are erroneous and misleading. Probably all such analyses were based on the mere combustion of the carbon black and the assumption that everything that burned away was carbon. The lowest percentage of carbon in any competent carbon black analysis that I have ever seen was obtained in the case of the famous Peerless Black and this showed 80 per cent on the commercial substance and 85 per cent when it was dried at a temperature of 110 degrees C.

No one has yet shown what connection, if any, there is between the commercial qualities of a carbon black and its percentage of carbon; this is a very interesting field for research, well worthy of attention.

Carbon black is an amorphous mixture of hydrocarbons and other organic compounds, some of which contain oxygen, none of which have ever been isolated and of which the number is probably very great.

One important and striking fact with regard to the making of carbon black is that only a small portion of the weight of natural gas is obtainable as carbon black. It is true that by calcining gas one may obtain more soot, containing as a rule adamantine particles and amounting to 6 or 7 per cent of the weight of the gas and possibly in some instances to more than this, but the material thus obtained has never been made at a competitive price, and is unsalable at any price, owing to its poor color, deficiency of coloring power and usually the presence of grit. Nevertheless, I do not by any means maintain that this method may not ultimately become of great commercial importance. Hitherto, it has been conducted only on a small scale and at a prohibitory expense by reason of the small yield in proportion to the value of the apparatus employed and the rapid destruction of the apparatus by the methods of manufacture or the great expense of the apparatus relative to the yield.

PERCENTAGE OF RECOVERY FROM NATURAL GAS.

Thirty-three years ago the yield was believed to be from one to three pounds per thousand cubic feet, which would be less than 1/30 of the carbon content of the gas. At the present time in West Virginia from 1/20 to 1/30 of the carbon is recovered in the shape of carbon black under proper working conditions. The Louisiana gas is poor in quality and yields less than 1/30.

INFLUENCES INCREASING COST OF CARBON BLACK.

Carbon black makers have been harassed by legislation. In Louisiana such attempts have ceased after a period of activity.

In Wyoming a law has been passed forbidding the erection of carbon black factories within a certain distance from cities of a certain population, a regrettable and foolish law, which probably would not stand the decision of the Supreme Court of the United States; but, at any rate, it is a distinct deterrent to the manufacture of carbon black. In West Virginia many attempts have been made to pass adverse legislation, and a law has recently been passed taxing the transportation of natural gas, but it is not in force pending the decision of the Federal courts of last resort.

Another cause that has operated to increase the cost of carbon black is the increasing value of natural gas. For instance, at Clarksburg, West Virginia, six years ago, gas was sold to the glass makers at 4 cents a thousand. They are now paying 27 cents a thousand, and in Grafton, West Virginia, they are paying 33 cents a thousand.

CHEMICAL PATENTS.

THE UNITED STATES.

Process of Preventing the Inner Walls of Rubber Hose from sticking during manufacture, which consists in simultaneously applying to the inner and outer walls of an uncured inner tube a mixture of water and a powdered agent capable of being deposited upon the walls of the tube and preventing adhesion of the walls. (Frank C. Moore, Canton, Ohio. United States patent No. 1,344,143.)

Printing-Roller Composition. A resilient ink-distributing roller formed of a vulcanized composition comprising a mixture of previously vulcanized and previously unvulcanized rubbers in nearly equal proportions by weight and together constituting the greater part of the composition. (Abraham L. Freedlander, Akron, Ohio, assignor to The B. F. Goodrich Company, New York City, United States patent No. 1,344,631.)

Method of Treating Fabric. This consists in first impregnating the fabric with an emulsified lubricating material and subsequently applying a vulcanizable plastic. (Erwin E. A. G. Meyer, assignor to Morgan & Wright—both of Detroit, Michigan. United States patent No. 1,344,645.)

Inking Roller for Printing Presses. The ingredients include, approximately, in weight, aluminum flake, two pounds; lime, one-half pound; sulphur, three and one-half pounds; magnesia, four pounds; rubber, 40 pounds, and a softening agent. (Lee La Tour and Alton F. Munnell, assignors of one-third to Warren Small, all of Omaha, Nebraska. United States patent No. 1,345,200.)

THE DOMINION OF CANADA.

Producing Rubber Compositions and Vulcanizing Products. The process of forming a rubber compound which consists in adding to rubber a wet precipitate of barium sulphate, which precipitate has been formed in the presence of a colloidal gel, mixing the resultant precipitate with the rubber, drying the mix, and heating the mix with a vulcanizing agent to effect vulcanization.

The homogeneous vulcanized product formed by adding to rubber animal glue formed into a gel by water, mixing the gel with the rubber, driving off the water, and heating the resultant dry mix with a vulcanizing agent to effect vulcanization. (The Goodyear Tire & Rubber Co., assignee of Robert Clifford Hartong, both of Akron, Ohio, U. S. A. Canadian patent No. 201,278.)

Plastic Material. A new substitute for horn, hard rubber, celluloid, etc., consisting essentially of albuminoids treated with formaldehyde and of the fine cell membranes of the emptied yeast cells. (Earnest Krause, Steglitz, and Hans Blucher, Leipzig, both in Germany. Canadian patent No. 201,420.)

THE UNITED KINGDOM.

Artificial Rubber Tire Filling. A typical composition for the purpose indicated consists of five parts of mineral oil, such as "Valvoline," to one part protochloride of sulphur. V. Villa, 34 rue Bayard, Toulouse, France. British patent No. 141,755.)

Vulcanizing India Rubber. In the vulcanization of rubber compounds by hot air, litharge or its derivatives is replaced by an organic or inorganic reducing agent to obtain a light-colored product. Suitable agents are hydro-quinone, pyragallol, tannins, paramidophenol, glycine, trioxymethylene, and other derivatives of formaldehyde, hydrosulphites, neutral sulphites. In general, the amount of reducing agent should not exceed ten per cent of the rubber. (A. Heilbronner, 74 Boulevard Malesherbes, Paris, France. British patent No. 142,083.)

Coating Materials for Fabrics. The material known as Turkish birdlime produced from the fruits of *cordia myxa* and

cordia latifolia, is thinned and used for proofing balloon fabrics, gas helmets, etc. The balloon fabric is composed of two sheets of thin flexible material, one or both sheets being of absorbent material. One of the sheets has applied to its outer surface a coating of rubber or waterproof varnish, and to its inner surface a thin layer of birdlime. The other sheet has a coating of rubber, etc., on the surface next to the birdlime, the other surface being left bare. (C. A. Cleghorn, Brackenside, Woburn Sands, Bedfordshire, and Gayner Pneumatic Co., 95 Cannon street, London. British patent No. 142,160.)

A Tire Filling Molded in Cylindrical Form and Used to replace the ordinary inflated inner tube is formed by adding sulphur chloride (six pounds, nine ounces) to a mixture of soya bean oil (25¾ pounds), magnesia (two pounds), and venetian red (five ounces). The oil is cooled before admixture, to 20-32 degrees F. to moderate the reaction. To insure uniform cooling the molds are provided with tubular metal cores which are withdrawn when the composition has set and the central space is filled with a fresh quantity of composition. (W. G. Wright, 1838 Collingwood street, Vancouver, B. C., Canada. British patent No. 142,416.)

PROCESS OF MAKING HEXAMETHYLENE TETRAMINE.

Commercial ammonium carbonate is dissolved in 40 per cent formaldehyde solution, the reaction taking place readily without application of heat and with brisk evolution of carbon dioxide. The solution is evaporated to dryness on a water bath under reduced pressure, and the residue is sublimed *in vacuo* or recrystallized from absolute alcohol. To compensate for its variable composition the amount of ammonium carbonate taken should be about 10 per cent in excess of the theoretical quantity. The yield of hexamethylene tetramine is about 66 per cent of the theoretical amount. (W. Herzog, *"Zeitschrift Chemie,"* 1920, 33, 48.)

LABORATORY APPARATUS.

THE SCHAAR UNIVERSAL ELECTRIC HEATER.

Electric Heater.

The illustration shows an all-purpose electric heater that can be used as a hot-plate or for heating flasks or test tubes. As a flask heater it displaces the usual tripod or support and burner. Test tubes are heated by placing them in the perforated cylinder which fits into the center of the heater between the coils.

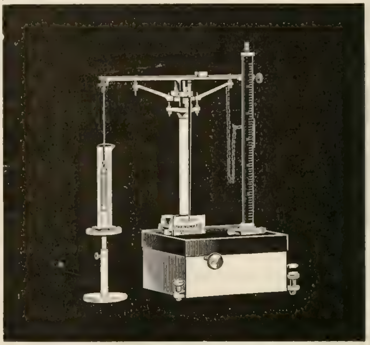
To transform the heater into a hot-plate the conical top is removed and replaced with a metal disc which fits over the opening.

The heater is mounted on a solid base which can be screwed to the table. (Schaar & Co., 556 West Jackson Boulevard, Chicago, Illinois.)

SPECIFIC GRAVITY CHAINOMATIC BALANCE.

Reference to the illustration shows the general construction of this balance, advantage having been taken of the salient features of the analytical chainomatic balance, which has so revolutionized weighing in analytical chemistry. There are no loose weights to use, all weighings or determinations are accomplished by placing the sliding weight in the proper notch on the beam, and obtaining the final reading by adding weight to the beam by means of the chain.

The balance is furnished either with or without a case. In the former instance it has a sensitivity of one-tenth of a milligram. The instrument has an aluminum beam, agate bearings, glass base, spirit level, etc. The plummet displaces exactly two grams of distilled water at 15 degrees C. The enclosed thermometer, carefully calibrated, ranges to 30 degrees C. The small displacement makes the balance invaluable where only small quantities of liquid are available. (Christian Becker, Incorporated, 92 Reade street, New York.)

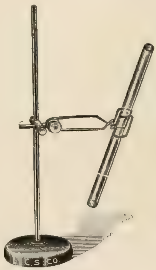


Specific Gravity Balance Without Case.

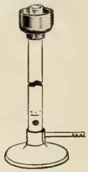
MONOCHROMATIC FLAME ATTACHMENT AND TUBE SUPPORT.

A new monochromatic flame attachment adaptable to any ordinary Bunsen burner is shown in the accompanying illustration. It consists of a simple cup arrangement permitting the solution of any salt to be used.

A very convenient and simple stand or support for tubes is here shown. It is compact, low priced and suitable for supporting tubes of any kind and in connection with holding apparatus in place. Both of these useful laboratory accessories are marketed by the same company. (Central Scientific Co., 460 East Ohio street, Chicago, Illinois.)



Tube Support.



Flame Attachment.

FINENESS AND TEXTURE OF PIGMENTS.

An unique method for testing the fineness and texture of pigments is given by H. A. Gardner in Circular No. 90 issued by the Paint Manufacturers' Association of the United States (Philadelphia).

The method of test consists in rubbing with the finger a portion of the pigment across the grooves of an Edison disk phonograph record and observing the surface under a microscope. There are 150 grooves per inch of radius on a disk record, and each groove has a radius of curvature of 0.004-inch and average depth of 0.001-inch. The feel of the pigment on the record under the finger, together with the microscopic examination, will show characteristic differences in the pigments. The number of particles per unit weight of pigment may be determined with a haemacytometer using a suspension of one gram of pigment in one liter of water containing a small amount of gelatin.

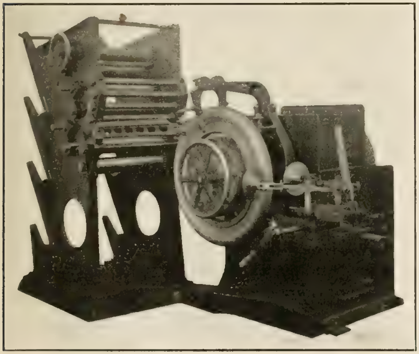
New Machines and Appliances.

IMPROVED TIRE BUILDING MACHINE.

The improved tire building machine here shown consists of two parts, a winding and stitching unit and a tension unit, both being doweled and bolted together forming a complete machine. It is used for the manufacture of fabric tires and for smaller sizes of cord tires. The capacity of the machine is 50 to 120 carcasses in a 10-hour day with one operator.

In operation, the roll of frictioned fabric is placed in the machine and the loose end threaded over the tension rollers and applied to the core. When this revolves it pulls the fabric over the tension rollers and lays it on the core. The speed of the core is controlled by gearing on the tension rollers so that the fabric cannot be applied to the core faster than the predetermined stretch in proportion to the gears and the tension rollers. Thus, the fabric will be stretched uniformly on all cores, regardless of width or variation of any kind, and can be measured to exact length and uniformly stretched, bringing the ends together.

When the machine has completed one revolution the fabric is cut off, the splice made, and the ply stitched down on the core. The next ply is put on in the same manner and when the proper number have been applied to the core, the bead is



The Banner Tire Builder.

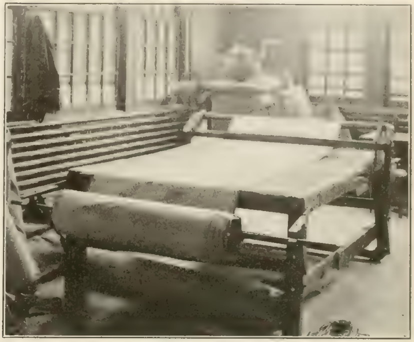
placed, and the remaining plies are added and stitched down separately. The tire is then trimmed and the carcass is finished.

This machine is unique in that as soon as the fabric is cut off, all sides of the core are available for inspection or removal, and no part of the machine overhangs it, or interferes at the sides with the handling or manipulation of the core. (The Banner Machine Co., Columbiana, Ohio.)

TIRE FABRIC CLEANING MACHINE.

Vacuum cleaning has been used for some time in removing from factories dust and dirt of every character, but the direct application of air cleaning in rubber mills is comparatively recent. That the Tuec air-cleaning system is being successfully used in cleaning and renovating tire fabrics may be seen in the illustration.

This apparatus is used in connection with a stationary cleaner. The top of the fabric is cleaned in passing over the bottom tube, and the bottom of the fabric is cleaned in passing over the top tube. The tubes are of brass and properly slotted, with adjustable cover to fit any size of fabric, up to and including 92 inches.



Renovating Liners.

These tubes pass from 160 to 320 cubic feet of air per minute, thus the fabric is given an air bath, removing soapstone, lampblack and other substances adhering to the fabric. (The United Electric Co., Canton, Ohio.)

VULCANIZER FOR FACTORY DAMAGED RUBBER GOODS.

Tire manufacturers can make firsts out of factory damaged casings by using the spot vulcanizer here shown. The clamp carries a steam plate 1½ by 3 inches and is provided with a rocking table inside the casing making it self-adjusting to any uneven thickness. It is used in footwear and druggist sundries factories and also for repairing inner tubes.

To set up the vulcanizer, run two headers along the wall, one for steam, the other for condensation. One set of headers

The Spot Vulcanizer.

can be used for several units placed about two feet apart. A short length of chain with a hook on the end, attached to a piece of rope from the ceiling should be provided to hold the casing in the desired position. (G. S. Andrus, Akron, Ohio.)

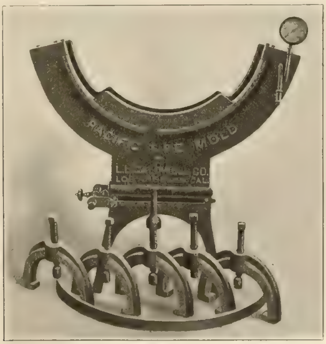
THE LAFAYETTE PRECISION TOOL GRINDER.

While one of its most obvious applications is on a tool-room lathe for both internal and external thread-gage grinding, this machine is also intended as a grinding machine when used on the bench, and as a grinding attachment to be applied to lathes, milling machines, shapers, planers, etc., to handle a variety of work. The grinding-wheel spindle-bearing housing has a longitudinal movement in a saddle, which in turn has a vertical movement on the column. A swivel is provided with a protractor of large radius for inclining the grinding-wheel spindle, when thread grinding, to suit the helix angle. Micrometer dials are provided for both longitudinal and vertical adjustments, making it very convenient to obtain accurate settings whenever required for precision work. This machine is designed and manufactured for grinding within 0.0001-inch, and all of its parts are interchangeable. (Lafayette Tool & Equipment Co., Lafayette, Indiana.)

UNIVERSAL TOOL GRINDER.

RETREAD MOLD AND SECTIONAL VULCANIZER.

A compact, combination retread mold and sectional vulcanizer is being introduced on the Pacific Coast that can not only cure maximum size tires, including cord tires, in its one-third-circle matrix, but with bead molds, which can be supplied, sections may be vulcanized in the same mold as readily as in the ordinary sectional vulcanizer. It has a self-contained boiler, full steam-jacketed walls, and raised steam-jacketed center section to take bead molds when using it as a sectional vulcanizer. Non-heat-conducting blocks on the ends of the mold prevent the stock from flowing, blistering, or leaving a burr on the ends of a cure. The rib tread is machined in the solid casting; and, it is claimed, the retreaded tire has the appearance of a new cord tire.



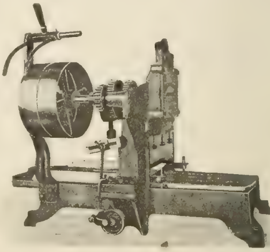
PACIFIC TIRE REPAIR MOLD.

The complete unit includes five strong steel clamps, gas burner, steam gage, safety valve, overflow valve, filler, filler valve, spring steel pressure band, wrench, and mill hose sand bag. If desired, connections can be provided for steam plant line, or for gasoline or kerosene gas burners. (L. L. Caldwell Co., 1128 Van Nuys Building, Los Angeles, California.)

STOCK CUTTER FOR SMALL MOLDED GOODS.

Rubber manufacture requires so many different processes that machines in great variety are employed. The mechanical engineer in a modern rubber mill is keen on labor-saving machinery and does not hesitate to adopt a machine or appliance used in other trades.

A case in point is the power vertical caramel cutter shown in the accompanying illustration that will find ready use as a stock cutter for small molded goods. It will cut any width from 1/16-inch to 2 inches, the platen being automatically moved forward by a ratchet-and-pawl feed. Squares of any size may be cut by turning the cut sheet of stock and again running it through the machine. Another type of machine employs a knife that operates with a shearing cut. (Thomas Mills & Bro., Inc., Philadelphia, Pennsylvania.)

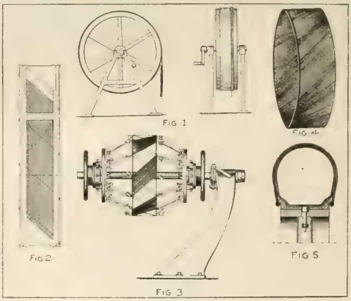


SHEET STOCK CUTTER.

MACHINERY PATENTS.

APPARATUS FOR MAKING CARLISLE CORD TIRES.

A BAND of composite material consisting of a plurality of rubberized cords is first laid in parallel contact on a sheet of uncured rubber. The rubber sheet of the correct width and length is applied to the periphery of the drum shown in Fig. 1 and the cord spirally laid on the sheet by revolving the drum.



CARLISLE CORD TIRE APPARATUS.

When the winding is completed the composite band is severed

by a bias cut and removed from the drum to the table shown in Fig. 2. Here the ends are trimmed and guide lines marked on the band at the desired angle and correct distance apart by means of a straight-edge and guide pins. The lines indicate the points where the band is to be alternately folded around the bead rings.

The band is then spirally wound upon and between two annular bead rings held in parallel position in the building stand shown in Fig. 3, the band being passed back and forth between, and over and around the rings with the exposed surface of the rubber sheet facing inwardly in the outer layer and outwardly in the inner layer. In the same way, a second band may be applied between the convolutions of the first band, and its interior surface covered by a sheet of rubber stock.

The completed carcass shown in Fig. 4 is then shaped on an air bag as seen in FIG. 5, or an ordinary core and finally completed and cured in the usual manner. (Fred B. Carlisle, Andover, Massachusetts, assignor to Joseph M. Gilbert, New York City. United States patent No. 1,345,995.) Patent No. 1,345,996, granted to the same inventor and assignee, relates to an improved band-marking apparatus, and patents Nos. 1,345,994 and 1,345,996—1,345,998, inclusive, refer to the process of manufacturing tire casings with this apparatus.

OTHER MACHINERY PATENTS.

THE UNITED STATES.

No. 1,345,426. Attachment for rubber making mills. H. A. Welton, assignor to Morgan & Wright—both of Detroit, Mich.

1,345,995. Apparatus for making pneumatic tire casings. F. B. Carlisle, Andover, Mass., assignor to J. M. Gilbert, New York, N. Y.

1,345,996. Apparatus for use in the manufacture of pneumatic tire casings. F. B. Carlisle, Andover, Mass., assignor to J. M. Gilbert, New York, N. Y.

1,346,158. Continuous tire-vulcanizing machine. T. F. Baily and F. T. Cope, Alliance, O.

1,346,231. Tire core. T. Midgley, Sr., Columbus, and T. Midgley, Jr., Dayton—both in Ohio, assignors to The Fisk Rubber Co., Chicopee Falls, Mass.

1,346,232. Overflow cavity for molds. T. Midgley, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls—both in Mass.

1,346,483. Tire vulcanizer. G. B. Cooper, Cleveland, O.

1,346,615. Apparatus for coating fabrics. A. Thoma, Cambridge, assignor to Abraham Sydeman, Boston—both in Mass.

1,346,706. Machine for forming rolls on toy balloons. H. R. Gill, Ashland, O.

1,346,947. Clamp for repairing tires. W. R. Fontaine, assignor to Western Vulcanizer Manufacturing Co., a copartnership consisting of H. K. Wheelock, F. A. Weller, and W. B. Fontaine—both of Chicago, Ill.

1,347,213. Clamp for vulcanizing machines. O. T. De Long, Atlanta, Ga.

1,347,256. Coating apparatus. L. R. Davis, assignor to Revere Rubber Co.—both of Providence, R. I.

1,347,291. Testing machine. R. B. Price, New York, N. Y., assignor to Rubber Regenerating Company, Naugatuck, Conn.

1,347,650. Rubber cement mixing machine. C. C. Mosher, Lima, O.

THE UNITED KINGDOM.

142,634. Hydraulic press for shaping and vulcanizing tires. E. Lefebre, 6 rue Carême-Prenaut Argenteuil, Seine-et-Oise, France.

142,642. Calender for stretching and finishing tubular fabrics. G. Hunt, 9 Elm Tree avenue, West Bridgford, and C. W. Campion, Robin Hood street—both in Nottingham.

142,871. Rubber-heel trimming machine. Miller Rubber Co., assignee of W. G. Lerch and C. P. Whisler—all of Akron, Ohio, U. S. A. (Not yet acecpted.)

142,996. Machine for making pneumatic-tire covers. Dunlop Rubber Co., 14 Regent street, Westminster, and C. Macbeth, Para Mills, Aston Cross, Birmingham.

143,668. Segmental core for tires, to permit stretching from flat to U-section form before vulcanization. J. H. Nuttall and D. Bridge & Co., Castleton Ironworks, Castleton, Lancashire.

GERMANY.

PATENTS APPLIED FOR, WITH DATES OF APPLICATION.

71,287. (December 13, 1919.) Covered funnel for machine for cutting rubber rings. Karl Koehler, Hanover.

80,452. (November 5, 1915.) Appliance for the preparation of shoes for vulcanization. Boston Rubber Shoe Co., Malden, Mass., U. S. A.

DESIGN PATENTS ISSUED, WITH DATES OF ISSUE.

744,265. (May 31, 1920.) Vulcanizing apparatus. Peter Gruber, Frankfort-on-Main.

744,870 (June 8, 1920.) Vulcanizing appliance. Henry Ewald Bart, Lawler, U. S. A.

745,896 (May 3, 1920.) Vulcanizing kettle. Peter Gruber, 68 Koelnerstrasse, Frankfort-on-Main.

746,249 (November 3, 1919.) Stand for vulcanizing apparatus. Fleming & Cie., G. m. b. H., Charlottenburg.

746,285. (June 21, 1920.) Mold for manufacture of rubber soles and heels. Wilhelm Knop, 34 Franken Allee, Frankfort-on-Main.

PROCESS PATENTS.

THE UNITED STATES.

No. 1,345,994. Manufacture of pneumatic tire casings. F. B. Carlisle, Andover, Mass., assignor to J. M. Gilbert, New York City.

1,346,389. Manufacture of cushion tires. F. W. Strang, assignor to Gibraltar Tire & Rubber Co., Dallas, Texas.

1,346,612. Manufacture of transmission disks for flexible couplings. R. J. Stokes, assignor to Thermoid Rubber Co., both of Trenton, N. J.

1,346,623. Manufacture of fabric tire casings. W. E. Williams, Chicago, Ill., assignor to the Firestone Tire & Rubber Co., Akron, O.

1,346,848. Manufacture of hollow rubber articles. F. T. Roberts, Cleveland Heights, O., assignor by mesne assignments to Paramount Rubber Consolidated, Inc., Philadelphia, Pa.

1,347,918. Manufacture of rubber and asbestos jointing material in long or continuous lengths. A. E. Stafford, assignor to Potter's Asbestos Co., Limited—both of Rochdale, Lancaster, England.

REISSUES.

14,875. Manufacture of vulcanized fabric belting cut on the bias. C. C. Gates, assignor by mesne assignments to The Gates Rubber Co.—both of Denver, Colo. (Original No. 1,281,153, dated October 8, 1918.)

THE DOMINION OF CANADA.

201,253. Manufacturing combined leather and rubber heels and attaching them to shoes. The United Shoe Machinery Co. of Canada, Limited, Maisonneuve, Que., assignee, of J. F. Standish, Massachusetts. U. S. A.

200,689. Manufacture of composite rubber and fabric top for cycle and like saddles by vulcanizing together two layers of rubber of different mixings separated by a layer of fabric. J. Jelley, Coventry, and H. Jelley, Birmingham—both in England.

THE UNITED KINGDOM.

142,257. Manufacture of tire casings, by W. L. Mitten, 125 Dennison avenue, Davenport, Ia., U. S. A.

142,353. Attaching detachable heel-pads of rubber or other material. W. R. Vance, 64 Rushfield avenue, Belfast.

142,801. Manufacture of cloth-lined rubber shoes, etc. Y. Ose, Majima-Cho, Shitaya-ku, Tokio, Japan. (Not yet accepted.)

143,445. Retreading tires. S. H. Goldberg, 1918 Prairie avenue, Chicago, Illinois, U. S. A.

THE FRENCH REPUBLIC.

504,142. Manufacture of seamless rubber goods. A. Boeckl.

GERMANY.

PATENTS APPLIED FOR, WITH DATES OF APPLICATION.

32,189. (August 25, 1919. Italian patent, June 26, 1918.) Production of waterproof covering on hygroscopic material. M. Arosio.

49,583. (December 29, 1919.) Repairing pneumatic tires. E. Latzel, 7 Beutzstrasse, Dresden.

PATENTS ISSUED, WITH DATES OF ISSUE.

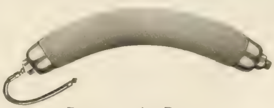
326,541. (October 10, 1918.) Vulcanizing rubber, reclaimed rubber, and similar products to metals. Felten and Guilleaume Carswerk Aktien-gesellschaft, Koeln-Mulheim.

REPAIRABLE AIR-BAG FOR TIRE REPAIR.

This tire repair air-bag consists of a metal frame and a cover made from two pieces of scrap inner tube covered with stockinette. It is said that this bag will eliminate the use of pads and last from forty to eighty cures. It can be quickly renewed in the following manner.

FRAME OF AIR-BAG.

Two pieces of tube are cut the length and size of the bag desired, and one tube is drawn inside the other. The tubes are placed over the frame that is held in a vise and the ends of the tubes tied to the ends of the frame with string. Two pieces of stockinette are applied over the tubes, the end cap placed over the stockinette and tubes, and the nut is tightened. The frame is then replaced in the vise at the tightened nut, the tubes and stockinette pulled over the other end of the frame, the cap applied and the nut tightened.



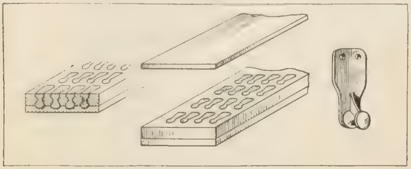
PERPETUAL AIR-BAG.

This bag is made in three, three and one-half, four and one-half, and five and one-half-inch sizes. The latter two take care of five and six-inch tires, respectively. (Perpetual Air Bag Company, 2103 South Michigan avenue, Chicago, Illinois.)

ARTISTIC MOLD WORK.

By Arthur C. Squires.

THERE ARE almost as many grades of mold work as there are states in the Union. Some work is coarse and without finish. Other is in color, texture, and finish, a product of great perfection. To this last-named class belongs the molded rubber grip used on hose supporters. Goods of this sort come under the general trade term "notions." As they are sold by the dry goods trade they must, of necessity, look at least as well as the dainty fabrics that are their counter mates. Of these goods some are wholly of rubber and some of both rubber and fabric. Where the goods are to present a fine appearance, and one side shows fabric, the molding involves considerable skill and processes not usually followed. The soft rubber garter grip is of this sort and merits especial description.



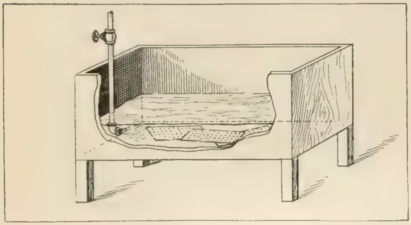
GARTER BUTTON MOLD.

Beginning with the compound: this is of an extra whitness secured by a formula of which lithopone is the base, a little ultramarine blue being added to get a blue-white. The compound is very rich, that the soft effect of pure rubber may be attained.

From the warming mills the snow-white compound goes to a three-roll calender which applies in two operations a continuous, thin coating of the stock to both sides of a web of unbleached sheeting. As the rubberized fabric finally leaves the calender it is wound up on a stock shell with a cotton liner between the gummed surfaces to prevent their sticking together.

The calendered stock is then cut into pieces conforming in width and length to the button mold, and placed in "books" for convenient handling.

The rubber button stock is of the same snow-white compound as that used for coating and sheeting, and is run through a tubing machine provided with a die conforming to the size of the button cavities in the mold. As this continuous cord is extruded from the tubing machine it is cut into small pieces of the proper size to fill exactly each mold cavity.



BLEACHING TANK.

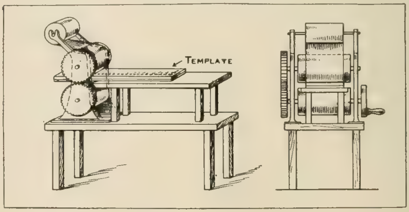
The 144-cavity steel button mold is originally made in three parts for convenience in die sinking, the two sections which form the rubber tab being riveted together while the third section or top plate is loose. After warming the mold slightly and dusting it with soapstone, pieces of the white button stock are inserted in each cavity, and a full-sized sheet of the calendered sheeting stock is laid over the buttons to which it adheres. The top plate is then placed over the sheeting and the mold and its contents are ready for the cure that is effected in a vulcanizing press. After vulcanizing, the sheets containing the buttons are removed, the mold refilled, vulcanized and so on.

The next step is bleaching—that is accomplished in a wood tank containing water and chloride of lime, into which a live-steam pipe opens. The button sheets are placed in the tank and bleached by the boiling solution. After being dried by tumbling the sheets are ready for the stockinette that is to be applied to the back of the tab.

The snow-white stockinette is passed through the 3-roll calender, where it is coated on the unfinished side with a special white compound and wound up on a stock shell, no liner being required. The roll of stockinette is then placed in a slitting and rewinding machine that cuts the roll into strips, equal to the width of the button mold, and rewinds the strips on reels.

After the vulcanized button sheets have been coated on the back with a special cement they are ready to be "backed" with stockinette. This is done on a two-roll doubling machine that applies the stockinette to the backs of the button sheets, and cold cures at the same time. A wood or metal template is employed for holding the button sheet in place during this operation. A number of doubling templates can be used to good advantage.

The button sheet is now placed in the template with the buttons down, and a cold-curing solution brushed over the cemented surface of the sheet, after which the template is placed on the platen of the machine. The end of the coated stockinette strip being drawn down from the reel is passed around the pressure roller and alined with the end of the template to which it adheres.



STOCKINETTE-APPLYING MACHINE.

When the machine is operated by turning the hand wheel the template passes under the pressure roller that doubles and applies a sheet of stockinette to the button sheet. The web is severed and another template placed in the machine, and the operation repeated.

The button sheets backed with stockinette are fully cured in about 30 minutes, after which the button tabs are died out with special cutting dies and sent to the finishing department, where they are assembled.

AMES HOLDEN MCCREADY, LIMITED, MONTREAL, QUEBEC, HAS promoted N. M. Lynn, formerly manager of its Edmonton branch, to middle western sales manager, with headquarters at its Winnipeg, Manitoba, office. He will have charge of sales in the provinces of Manitoba, Saskatchewan, and Alberta, with division offices and warehouses at Winnipeg, Regina, and Edmonton, and branch offices and warehouses at Saskatoon and Calgary. In addition to the lines of shoes, canvas, felt and rubber footwear already carried, all of these warehouses will be stock and distributing points for Ames Holden tires as soon as these are on the market in sufficient quantity.

New Goods and Specialties.

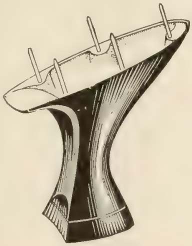
A CLEVER SPONGE RUBBER DOLL.

What is perhaps the newest doll is cut from sponge rubber about an inch thick, reminding the grown-ups curiously of the gingerbread doll of younger days. Inside the sponge rubber hood is the head, made of an ordinary gray rubber ball, and on this ball the features are painted—blue eyes, saucy rose-bud mouth, yellow curl, and all. There are yellow buttons, too, painted on the "dress," and buckles on the "shoes." Incidentally, the head is sewed to the body with light-blue yarn, and more of the same yarn is tied around the neck and wrists. The yarn is also used for sewing in the circular piece of sponge rubber that forms the back of the hood. A later development of this doll shows a small square of the sponge rubber fastened to the top of the head, instead of the hood, while the space on the back of the ball is utilized for stamping the manufacturer's patent notice. (Rees-Davis Toy & Novelty Shop, 1716 Stevens Building, Chicago, Illinois, patent owner.)

Sponge Rubber Doll.

FRENCH HEEL WITH RUBBER LIFT.

A new French heel is made of aluminum with a rubber lift attached. The rubber heel pad is attached to a metal plate by means of a screw in the center. This plate prevents the rubber heel from turning and draws it tightly to the aluminum heel proper to which it is fastened. This metal plate coming between the aluminum heel and the rubber one protects the rubber one from becoming worn by the aluminum. The illustrations show the entire heel ready for attachment to a boot and the rubber lift alone with the screw-hole in the center. This novel heel is patented by the manufacturer. (Automatic Aluminum Heel Co., 617 Albany street, Boston, Massachusetts.)



Aluminum French Heel with Rubber Pad.

THE GLOVE WITH RUBBER GRIPS.

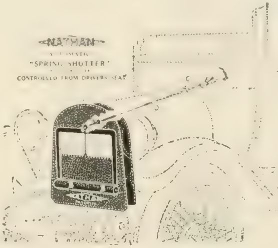
On page 365 of our March issue we described and illustrated a design for a glove with circular spots of ribbed rubber inside the hand and fingers, to facilitate the gripping of objects while the glove was being worn. A United States patent, No. 1,346,683, has now been granted on this glove. (J. N. Reynolds, Atlantic, Iowa.)

NEW BRITISH ARMY WATERPROOF.

A recent amendment to the dress regulations for officers in the British Army approves a new pattern of waterproof coat. It is made of waterproof drab cotton twill, with two removable linings, one of fleece and one of oilskin. It is double-breasted, reaching to the knees, and has a buckled belt of the same material. Earlier patterns may be used by officers until worn out, but future provision must be of the new pattern.

RADIATOR COVER OPERATED FROM DRIVER'S SEAT.

A cover for automobile radiators that operates from the driver's seat is made of rubber-coated fabric rubberized to the lining, thus assuring the retaining of heat and resistance to the cold in winter. The particular style illustrated is the "automatic spring shutter," operated like a window shade from a roller which is detachably mounted on the radiator cover. This permits the easy removal of ice and adjustment of the spring by which the roller automatically winds up. (Nathan Novelty Manufacturing Co., 55 Fifth avenue, New York City.)



"Nathan" Automobile Radiator Cover.

PEARSON'S TOBACCO POUCH.

What is called the "Humidyzor" pouch for tobacco is made up in two styles of rubberized surface and several kinds of real leather, enabling the smoker to choose the style he likes best, according to the circumstances in which he will make most use of it.

In the rubberized styles, a specially dyed fabric and an ordinary bombazine are rubberized together and the bombazine side is given whatever coating finish is desired.

Pearson's "Humidyzor" Tobacco Pouch.

In the leather pouch, the same double fabric above described is used as a lining and sewed to the leather.

Accordingly, the pouch may be moistened inside without any water going through to the outside. This result has been obtained as the outcome of considerable expensive experimenting to produce such a double texture fabric, coated on the outer side, which would have the necessary water resistance on the outside and sufficient water absorption on the inside. The humidor feature of the pouch is patented and the pouch fastens with ball-and-socket snaps, as illustrated. (Pearson Products Corporation, 725 Broadway, south of 8th street, New York City.)

also

A WESTERN STEAM-CURING BAG.

A newly incorporated company in the Middle West is putting out a different style of steam curing bag for vulcanizing tire repairs. It claims that the intense heat held in it cures at a uniform temperature the rubber both outside and inside, and has been in use for over three years. A larger size, to cure six, seven and eight-inch truck tires, has been perfected during the present year. This device is covered by basic patents in the United States and foreign countries, including Canada, Great Britain, France and Germany. (The Steam Bag Corporation, 1545-1547 Broadway, Denver, Colorado.)


The "20th Century" Steam-Curing Bag for Tire Repairs.

THE FIRST CUBAN CORD TIRE.

That a representative of a Cuban tire manufacturer was in this country to investigate manufacturing processes and buy suitable machinery for the making of cord tires was noted in our news columns last month. The result is shown herewith—the first Cuban cord tire. (Compania Cubaña de Zunchos y Goma—Cuban Tire & Rubber Co., Havana, Cuba.)


First Cuban Cord Tire.

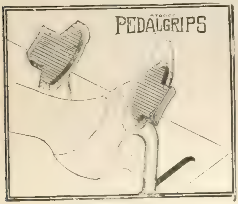
DUST CAP FOR WIRE WHEELS.

Harmonizing with the metal spokes of wire wheels, there has been designed a tire valve of nickeled brass, which is also longer than the one ordinarily used on tires. This covers the entire length of the valve stem. Patent has been applied for. (A. Schrader's Son, Inc., 783 Atlantic avenue, Brooklyn, New York.)


Universal Adjustable Dust Cap.

"PEDALGRIPS" FOR FORDS.

The number of Ford automobiles in use offers an incentive to inventive genius to develop various accessories for use with this make of car and in the accompanying illustration is shown a variation of what appears to be a special favorite in this field. A Ford car, as any driver of one knows, requires efficient pedal action, and rubber footpads are a definite help in securing this efficiency.



Ford "Pedalgrips."

"Pedalgrips" are made of high-grade rubber, with a ribbed, non-slip surface and make for sure-footedness, even for women who insist on wearing high-heeled footwear when driving. These pedal pads are furnished for both transmission and brake pedals and are applied without either bolts nor screws. (Stadeker Metal Specialty Co., 310 South Canal street, Chicago, Illinois.)

A DETACHABLE VACUUM CLEANER.

A convenience for cleaning the upholstery of the automobile, motorists' clothing, etc., is pictured here, which attaches to the exhaust pipe of an automobile. To it is fastened a rubber hose and to the hose an open nozzle for cleaning floor mats, heavy dirt, etc., or a brush for cleaning upholstery and clothing. The exhaust from the engine when running operates this device, which is extremely simple. (Franklin Automobile Co., Syracuse, New York.)

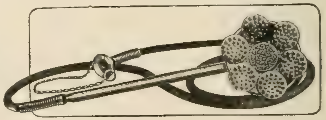

La France Detachable Vacuum Cleaner.

A NEW SPORT SHOE.

A new sport shoe is an oxford of white buckskin, with tan or black trimmings, and a heavy, corrugated, non-skid sole of rubber. It is designed especially for golf or general sport wear. (Norman & Bennett, Inc., 144 High street, Boston, Massachusetts.)

THE "STAR" MASSAGE SPRAY.

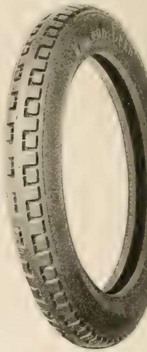
A new development of the shower bath spray is shown here. One of the features that is patented is that the water sprays through holes in the metal container, back of the applicator, instead of from the rubber prongs as in some other designs. There are six round groups of these rubber prongs arranged in a circle on the outside of the metal container, while in the center is a round piece of sponge rubber which serves as a sponge. The applicators are removable, which contributes to the sanitary qualities of this latest spray. (The Fitzgerald Manufacturing Co., Torrington, Connecticut.)


The New "Star" Massage Shower Spray.

THE NEWCOMER IN CORD TIRES.

One of the newest cord tires has a rectangular tread that offers resistance in a straight line to both the side and forward skid. At the same time, it affords complete steering ease because of its continuous, unbroken road surface. The Kenyon Cord is made full oversize, with black tread and gray side walls.

It is interesting to know that the manufacturer turned to cord tires as the solution of the after-the-war problem of what to do with the big factory that made waterproof clothing for the soldiers, as well as rubberized life-saving suits and weather-proof and water-proof clothing for civilian wear, for both men and women. (C. Kenyon Co., 754 Pacific street, Brooklyn, New York.)


Kenyon Cord Tire.

Activities of The Rubber Association of America.

There was very little activity in Association affairs during the past month other than the usual routine matters. Division meetings were deferred until after the vacation period, and for that reason there is nothing to report at this time.

RUBBER STATISTICS FOR FIRST HALF OF 1919.

New York, August 6, 1920.

To firm members:

There are enclosed two copies of the statement embodying a summary of the returns made by rubber manufacturers and reclaimers to Questionnaire No. 101, covering the first six months of 1919.

The information presented represents totals for the number of manufacturers and reclaimers reporting the data for their companies and is submitted as an entirety without any attempt to make an estimate as to the approximate totals for all firms to whom the questionnaire was sent.

In this connection, we are much gratified to be able to direct attention to the fact that the response to Questionnaire No. 101, while slower than we hope it will be in the future, is finally considerably more complete than was the response to the previous Questionnaire, No. 100, the exact figures being 153 returns to Questionnaire No. 101 *vs.* 103 to Questionnaire No. 100, both out of a total of approximately 270 firms to whom each questionnaire was sent.

A new questionnaire, No. 102, covering the latter half of the year 1919 is being sent you at this time, and we wish to take this opportunity of urging that the response to this questionnaire be as prompt and complete as is possible, in order that information for the entire year may be available in the very near future.

A. L. Viles, General Manager.

THE RUBBER ASSOCIATION OF AMERICA, INC., STATISTICS COMPILED FROM QUESTIONNAIRE NO. 101, COVERING THE FIRST SIX MONTHS OF 1919.

This questionnaire was sent to 273 firms of which 163 responded and 153 reported statistics.

Average Total Daily Number of Employes, 166,103.

	Reported by Manufacturers who also Reclaim (18).	Reported by Reclaimers Solely (10).	Totals.	Approximate Amount Scrap Used per Pound of Reclaimed Produced.
Reclaimed rubber produced from raw and cured scrap..*pounds*	25,861,345	57,515,312	83,376,657	1 lb., 5 oz.
Scrap rubber (including raw and cured scrap) consumed in production of reclaimed rubber ......*pounds*	31,928,556	80,922,149	112,850,705	

Number of Pounds of Crude Rubber Consumed in the Manufacture of Rubber Products and Total Sales Value of Shipments of Manufactured Rubber Products.

Product.	Number of Pounds Crude Rubber Consumed.		Total Sales Value of Shipments of Manufactured Rubber Products.	
Tires and tire sundries:				
Automobile and motor truck casings......	103,926,192		$94,329,257	
Automobile and motor truck tubes	22,272,497		27,246,850	
Solid tires	11,686,767		7,889,941	
Other tires and tire sundries	6,523,726		6,466,243	
*Total — tires and tire sundries		145,538,745		$307,403,497
Other rubber products:				
Mechanical goods....	10,053,317		$45,042,163	
Boots and shoes	14,301,480		46,617,582	
Other products	6,695,533		27,888,645	
*Total—other rubber products		31,159,003		$127,756,611
Grand total—all products.		176,697,748		$435,160,108

*Note.—It should be noted that the above totals of "Tires and tire sundries" and "Other rubber products" include some figures which are not shown under the various items, which is due to the fact that some of the reports received were not itemized.

QUESTIONNAIRE NO. 102.

New York, August 6, 1920.

To rubber manufacturers:

Questionnaire No. 102, in duplicate, is enclosed with the urgent request that it be given attention and the data called for therein be supplied to this office at the earliest opportunity. The information desired is that covering the second six months of 1919, to supplement the information compiled from Questionnaire No. 101, which covered the first six months of 1919, the results of that questionnaire being distributed concurrently with this.

We have frequently directed attention to the desirability of there being available accurate and comprehensive statistics covering the industry, and in view of present general conditions we believe that the value of data of this character and of the more detailed sort to which we hope this statistical work may be extended during the coming year, will be obvious to everyone.

We wish to emphasize again the fact that there is no cause for hesitancy upon the part of any member in supplying the data called for by this questionnaire, because under the arrangement with the Guaranty Trust Company, by which the work of compilation is done, none but the total figures are available to any member of the Association or its staff and there is no likelihood of the data for an individual member becoming known to others

The questionnaire covering the first six months of 1920 will follow this in a few days, and we wish to suggest that at this time the compilation of data is especially important and we hope, therefore, that each of our members will find it possible to give the necessary attention to the preparation and transmittal of information which will enable the total figures to be distributed within the next six weeks.

A. L. Viles, General Manager.

NEW TRADE PUBLICATIONS.

The Apsley Rubber Co., Hudson, Massachusetts, has issued its new price-lists of canvas footwear, including both its regular lines of tennis and its Ap-Sole line of summer footwear. The lists are dated August 2, 1920, and are subject to change without notice.

The cartoon in advertising is proving a very effective medium of pleasant publicity. Rubber and other firms have used cartoons extensively in printed advertising, but it remained for The B. F. Goodrich Rubber Co., Akron, Ohio, to apply the idea to motion pictures. These amusing cartoon episodes of Goodrich tires put the audience in an uproar, and the next instant the dealer's name and address flashes on the screen. It is the kind of advertising that brings comment as well as results.

The Boston Belting Co., 80 Elmwood street, Boston, Massachusetts, has issued a good-looking booklet in two colors, describing and giving prices of rubber and balata belting, hose, matting and mats, packing and molded goods. The cover design is especially interesting as it is a reproduction of an original print that was designed prior to the Civil War.

"The Journal of the Royal Society of Arts" (London, England), issues of February 20th and 27th, 1920, contain a very interesting paper by Sir Francis Watts, K. C. M. G., D. Sc., Imperial Commissioner of Agriculture for the British West Indies, entitled "Tropical Departments of Agriculture With Special Reference to the West Indies," which was read at a meeting of the Colonial Section of the Society held on February 3, 1920.

Martinus Nijhoff, bookseller at The Hague, Holland, celebrates the 300th anniversary of the settlement of Batavia by issuing a catalog of publications on the Dutch East Indies, No. 454, "Histoire Naturelle, Cultures, Médecine et Anthropologie des Indes Orientales Néerlandaises." This includes 44 publications on rubber and gutta percha. The same house has issued recently catalogs on the Dutch in the Orient before and after 1800. It also

announces the new edition of the "Encyclopaedie van Nederlandsch-Indië" in four volumes.

THE YARNALL-WARING CO., PHILADELPHIA, PENNSYLVANIA, has just issued a well illustrated and highly informative 16-page bulletin, free on request, descriptive of Yarway blow-off valves, that will be read with particular interest in certain states where boiler laws require the use of either two valves or a blow-off valve and a cock on each individual blow-off line.

THE EDITOR'S BOOK TABLE.

"THE ORGANIZATION OF INDUSTRIAL SCIENTIFIC RESEARCH." By C. E. Kenneth Mees, D.Sc., Director of the Research Laboratory, Eastman Kodak Co., Rochester, New York. First Edition. McGraw-Hill Book Co., Inc., New York and London, 1920. (Cloth, 175 pages, 5½ by 8¼ inches.)

IN HIS PREFACE the author states that this book is intended as a contribution to the study of the best methods for organizing industrial research work and of the conditions under which such work should be conducted.

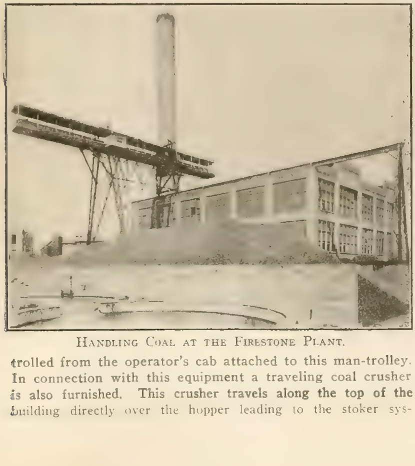
The author discusses the various types of research laboratories; their position in an industrial organization; their internal organization; the staff, building and direction of the work; and a chapter on the design of a research laboratory for a special industry in which costs of operation are dealt with. The book closes with a classified bibliography on the subject of research laboratories and an index of authors and of laboratories, which will doubtless be found of much assistance.

"A GERMAN-ENGLISH DICTIONARY FOR CHEMISTS." BY Austin M. Patterson, Ph.D. First Edition, John Wiley & Sons, Inc., New York. Chapman & Hall, Limited, London, 1917. (Flexible leather. 316 pages, 5 by 7 inches.)

English-speaking chemists generally will be grateful to Doctor Austin for valuable aid to them as available in this most convenient work. Particularly helpful features are the excellent introduction and the use of Roman in place of German text.

COAL HANDLING CRANE FOR RUBBER MILLS.

The coal-handling crane at the plant of the Firestone Tire & Rubber Co., Akron, Ohio, is of a semi-gantry type, one leg running on the ground and the other running along the roof of the building. The crane is equipped with a traveling man-trolley. All of the operations of the crane are con-

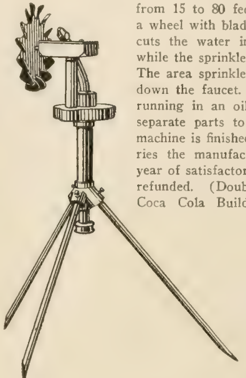


HANDLING COAL AT THE FIRESTONE PLANT.

trolled from the operator's cab attached to this man-trolley. In connection with this equipment a traveling coal crusher is also furnished. This crusher travels along the top of the building directly over the hopper leading to the stoker system. The crane handles coal from car to storage and from storage to the traveling coal crusher where it is crushed and discharged into stocker. Coal may also be handled direct from cars to crushers, if desired. The crane is electrically operated, alternating current being used. The man-trolley is equipped with two drums which are operated by friction clutches and brakes, this arrangement contributing to maximum speed of operation. A two-cubic-yard bucket of the four-line type is used. (McMyler-Interstate Co., Cleveland, Ohio.)

A ROTARY SPRINKLER OF VARYING RADIUS.

A new type of lawn or garden sprinkler which fits any hose connection has been developed, illustrated herewith. It is operated by means of the pressure of the water required for sprinkling, and will spray an area ranging from 15 to 80 feet in diameter. There is a wheel with blades like a propeller, which cuts the water into drops as it revolves, while the sprinkler head rotates in a circle. The area sprinkled is regulated by turning down the faucet. The gears are enclosed, running in an oil bath, and there are no separate parts to get out of order. The machine is finished in gold bronze and carries the manufacturer's guaranty for one year of satisfactory service, or price will be refunded. (Double Rotary Sprinkler Co., Coca Cola Building, Kansas City, Missouri.)



DOUBLE ROTARY SPRINKLER.

A "MERMAID" BRUSH.

In the INDIA RUBBER WORLD of January 1, 1919, there was illustrated and described the "Maid-of-America" hair brush, with removable rubber cushion in which the bristles were vulcanized. The manufacturer is now putting out a similar brush called the "Mermaid," which operates in the same way. (Monarch Brush Co., Troy, New York.)

INTERESTING LETTERS FROM OUR READERS.

TREUGOLNIK NOT RUN BY GERMAN CAPITAL.

TO THE EDITOR:

DEAR SIR: On behalf of my principals, the Russian American India Rubber Co. "Treügolnik" of Petrograd, I wish to take exception to a statement namely: "The "Treügolnik" company, before the war, was mainly run by German capital," which appeared in the last paragraph of an article written on page 533 of the May 1, 1920, issue of THE INDIA RUBBER WORLD, as the statement is not only without any foundation, whatsoever, but, appearing in your journal, it is likely to have a detrimental effect on the interests of the "Treügolnik" company.

From the fact that the article in question was written entirely in the interests of the "Treügolnik" company's largest competitor, it is possible that such incorrect information was given you for a definite purpose.

I sincerely trust that you will see your way clear to publish a contradiction in one of your next issues.

STINTON J. JONES,
For The Russian American India Rubber Co.
London, England.

News of the American Rubber Industry.

DIVIDENDS.

THE AJAX RUBBER CO., INC., has declared its quarterly dividend of $1.50 per share, payable September 15 on common stock of record August 31, 1920.

The American Chicle Co., New York City, has declared its regular quarterly dividend of one and one-half per cent, payable October 1 on both preferred and common stock of record September 18, 1920.

The Bergougnan Rubber Corporation, Trenton, New Jersey, declared a dividend of one and three-quarters per cent, payable August 10 on preferred stock of record July 10, 1920.

The Brunswick-Balke-Collender Co., Chicago, Illinois, has declared a stock dividend of 150 per cent, on common stock, payable in new class B stock, in addition to the regular quarterly dividend of one and three-quarters per cent, which was payable August 15 on common stock of record August 5, 1920.

The Firestone Tire & Rubber Co., Akron, Ohio, declared a quarterly dividend of one and three-quarters per cent, payable August 15 on its seven per cent preferred stock of record July 31, 1920.

The General Electric Co., Schenectady, New York, has declared its quarterly dividend of $2 per share, payable October 15, on common stock of record September 9, 1920.

The B. F. Goodrich Co., Akron, Ohio, and New York City, has declared dividends of $1.75 and $1.50 per share, the first payable October 1 on preferred stock of record September 21, and the second payable November 15 on common stock of record November 5, 1920.

The Goodyear Tire & Rubber Co., Akron, Ohio, has declared its quarterly dividend of two and one-half per cent, payable September 1 on common stock of record August 14, 1920.

The Lee Rubber & Tire Corporation, Conshohocken, Pennsylvania, and New York City, has declared its quarterly dividend of 50 cents per share, payable September 1 on stock of record August 14, 1920.

The Miller Rubber Co., Akron, Ohio, has declared a quarterly dividend of two per cent. payable October 1 on its new preferred stock of record September 10, 1920.

The Pennsylvania Rubber Co., Jeannette, Pennsylvania, at a meeting of the board of directors held on August 20, declared its regular quarterly dividends of one and three-quarters per cent on preferred stock and one and one-half per cent on common, both payable September 30 on stock of record September 15, 1920.

The Rubber Products Co., Barberton, Ohio, has declared its regular quarterly dividend of two per cent, payable September 1 on stock of record August 20, 1920.

The Tyer Rubber Co., Andover, Massachusetts, paid the regular quarterly dividend of $1.50 per share on preferred stock August 15, 1920.

FINANCIAL NOTES.

Sales of The Mason Tire & Rubber Co., Kent, Ohio, for the third quarter ended July 31, 1920, were $1,748,000, compared with $1,011,000 for the corresponding quarter of 1919, or an increase of over 75 per cent. Sales for the first nine months of the present fiscal year amounted to $5,200,000, compared with $2,550,000 for the corresponding period of last year, or an increase of more than 100 per cent.

The sales of The Goodyear Tire & Rubber Co., Akron, Ohio, for the first nine months of 1920 amounted to $162,202,467.21, according to official announcements. The company's sales for the whole of 1919 amounted to approximately $168,914,000. The gross sales of the company during July of the present year amounted to $17,185,113, as compared with $15,989,349 during the same month last year. It is estimated that the gross sales of the company will approximate $200,000,000 this year.

As a result of the new preferred and common stock financing and of its liquidating policy the Goodyear company is reducing its loans at the banks and expects by the end of its fiscal year to have its outstanding floating debt down to modest proportions.

The Brunswick-Balke Collender Co. reports sales for the six months ended June 30, 1920, of $15,243,178, a gain of $5,181,803. Net profits after all taxes amounted to $2,309,826. Gross sales for the first half of this year were at a record rate, showing an increase of 50 per cent. Stock dividends will be paid from the new stock authorized last April. In the meantime the company sold $3,000,000 common stock to its stockholders at par, increasing the amount actually outstanding to $9,000,000.

The Ajax Rubber Co., Inc., report net earnings of $1,528,634 for the six months ended June 30, 1920, equivalent to $7.64 a share earned on the 200,000 shares of stock ($50 par value). This compares with $1,886,730 or $9.43 a share in the corresponding period of 1919. Gross sales were greater in volume in the first half of this year than in any similar period of the company's history, exceeding the first six months of 1919 by about 16 per cent net. The income account for the six months ended June 30, 1920, compares as follows:

	1920	1919	1918	1917
Net earnings..........	*$1,528,634	$1,886,730	$1,959,608	$1,257,461
Dividends	600,000	488,528	426,000	390,000
Surplus	$928,634	$1,398,202	$1,533,608	$867,461

*After providing $157,871 for taxes.

Net sales of the United States Rubber Co., for the six months from January 1 to June 30, 1920, were $129,588,986, an increase of $30,099,615 over the corresponding period of 1919; and the net income, after deducting all interest charges and after allowing for depreciation and Federal taxes, was $13,690,924, an increase of $3,059,490 over the corresponding period of 1919.

The balance sheet of The B. F. Goodrich Co., as of June 30, 1920, shows as follows:

Assets: current assets, consisting of cash, bills and accounts receivable, and inventories of raw and finished stock, $104,470,421; investments and advances to other companies, $5,793,220, foreign associated companies, etc., $8,802,624; deferred charges, $1,231,813; real estate, plant, buildings and equipment, less reserves of $9,456,892, $27,762,228; patents and contracts, $1; goodwill $1; total, $148,060,308.

Liabilities: current liabilities, $31,902,556; 5-year 7 per cent convertible gold notes due April 1, 1925, $30,0000,000; reserves for contingencies, pensions and amortization of war facilities, $3,759,879; preferred capital stock, $38,412,000 (par $100); common (no par) represented by accumulated surplus, $43,985,873; total, $148,060,308.

The company's net profits were $7,600,000 before Federal taxes for the six months ended June 30, 1920, representing a decline of $100,000 from net profits of $7,700,000 for the corresponding period last year. At first glance this would seem to substantiate recent rumors that tire companies were doing less business. In the case of Goodrich, however, sales for the first half of this year were approximately $20,000,000 greater than in the first six months of 1919 and the reason why profits did not show a corresponding increase is attributed to substantial increases in the costs of raw materials. The advance of from 10 per cent to 20 per cent in

the retail prices of its products put into effect last March, coupled with the fact that raw materials, especially rubber, are becoming somewhat cheaper, should result in an increased ratio of profit on sales during the balance of this year.

On estimated sales of $90,000,000 in the first half of this year net profits, after preferred dividends but before Federal taxes, were at the annual rate of $21.60 a share on 600,000 shares of no par value common stock. This compares with $25.09 a share earned in 1919, the best year in the company's history.

In order to provide for expansion the International India Rubber Corporation, of South Bend, Indiana, which was incorporated for $1,000,000 under the laws of Delaware in 1915, on February 7, 1920, increased the capital stock to $2,500,000, by the addition of 60,000 shares, second issue, non-voting common stock of the par value of $25 per share. The sales earnings in 1917 were $107,333.52; in 1918, $155,646.81; and in 1919, $673,069.35. Up to March 1, 1920, sales were running more than 300 per cent of those for the same period of 1919 and the sales for 1920 are estimated at $3,000,000.

RUBBER STOCK QUOTATIONS.

The following quotations on the Cleveland Stock Exchange, August 19, of stock of the principal rubber companies were supplied by Otis & Co., Cuyahoga Building, Cleveland, Ohio.

	Last Sale.	Bid.	Asked.
Firestone T. & R. Co	117	114½	117
Firestone T. & R. Co., 1st pfd	93	93	96
Firestone T. & R. Co., 2d pfd	85	85	85¾
General T. & R. Co., pfd	102	...	102½
The B. F. Goodrich Co	52¼	...	...
The B. F. Goodrich Co., pfd	85	...	...
The Goodyear T. & R. Co	115	110	114½
The Goodyear T. & R. Co., 1st pfd	85	84½	85¼
Kelly-Springfield T. & R. Co	156⅛	...	...
Kelly-Springfield T. & R. Co., pfd	120	...	...
The Miller Rubber Co	119	115	...
Portage Rubber Co.	59⅛	50	...
Portage Rubber Co., pfd	82	...	...
Star Rubber Co.	350¾	...	...
Swinehart T. & R. Co	80	...	...
Victor Rubber Co.	29	...	29

NEW YORK STOCK EXCHANGE QUOTATIONS.

AUGUST 23, 1920

	Last Sale.	Bid.	Asked.
Ajax Rubber Co., Inc	....	49½	50
The Fisk Rubber Co	....	26⅝	26⅞
The B. F. Goodrich Co	....	54⅛	55½
Kelly-Springfield Tire Co	....	76	77
Keystone T. & R. Co., Inc	....	18	18½
Lee R. & T. Corp	....	21	22
United States Rubber Co	....	84½	85

NEW INCORPORATIONS.

Bedell Inc., S. M., August 7 (New York), $5,000. R. A. Wicksel; C. Schwartz; J. E. Ankus—all of 15 East 40th street, New York City. To manufacture tires.

Canton-Blackstone Sales Corp., The, July 28 (New York), $60,000. A. E. Beckert, 530 West End avenue, New York City; A. J. Ewald, 36 Prospect street, White Plains—both in New York; P. A. Proal, Red Bank, New Jersey. To manufacture tires and rubber goods.

Central Rubber Reclaiming Co., The, August 1 (Ohio), $175,000. J. F. Schaefer, president; C. E. Hart, vice-president; D. E. Reynolds, secretary and treasurer. Principal office, Defiance, Ohio. To reclaim rubber.

Collapsible Rim Co., The, June 17 (North Carolina), $300,000. W. W. Bruce; J. J. Nichols; F. L. Sale—all of Asheville, North Carolina. Principal office, Asheville, North Carolina. To manufacture and sell rims for automobile wheels.

County Seat Tire Co., Inc., August 19 (New York), $2,000. F. Brush, 320 South Fifth avenue; C. Rosenberg, 550 South Eighth avenue, both of Mount Vernon; D. Lisnow, 135 Broadway, New York City—both in New York. To repair tires.

F. & W. Tire Distributing Co., Inc., August 4 (New York), $100,000. A. D. Ferrell; L. P. Werlein; T. E. Terry—all of Buffalo, New York. Principal office, Buffalo, New York. To distribute tires.

French & Handy, July 30 (New York), $25,000. P. J. Ross; J. Q. Perry; H. W. French—all of 25 Beaver street, New York City. To deal in crude rubber.

Gordon Co., Inc., The H. B., July 23 (Massachusetts), $10,000. Bernard C., Harris B. and T. Gordon—all of South Pleasant street, Sharon, Massachusetts. Principal office, Boston, Massachusetts. To manufacture and deal in all kinds of rubber clothing.

Granville Tire Co., July 12 (New Jersey), $15,000,000. F. D. Buck; G. W. Dillman; M. L. Horty—all of Wilmington, Delaware. Principal office, 305 Ocean avenue, Jersey City, New Jersey. Agent in charge, W. George. To sell automobile tires.

Grasso Tube Marine Life Saver Corp., August 13 (New York), $250,000. J. H. Fitch; V. Guarino; L. Grasso—all of 106 East 119th street, New York City. To manufacture life belts and life-saving devices.

Guaranteed Tire Filler Corp., July 27 (New York), $50,000. J. and M. Stander; A. M. Chamow—all of 1,092 President street, Brooklyn, New York. Principal office, Brooklyn, New York.

Handy Rubber Heel Co., August 9 (Massachusetts), $100,000. W. Gamache, 31 Echo avenue, Beverly; W. Blaney, 1 Pearl street, Marblehead; J. J. McCarthy, 81 Washington street, Salem—all in Massachusetts. Principal office, Salem, Massachusetts. To manufacture rubber heels.

Hope Tire & Rubber Co., The, May 21 (Connecticut), $20,000. B. Yaraus, president and treasurer; S. Colitz, vice-president; M. H. Plainfield, secretary and general manager. Principal office, 140-142 Greyrock Place, Stamford, Connecticut. To rebuild tires.

Hopewell Insulation & Manufacturing Co., March 20 (Virginia), 7 per cent preferred, $200,000; $500,000 common. S. S. Sonneborn, president and general manager; E. A. Spengeman, vice-president; C. Branda, secretary. Principal office, Hopewell, Virginia. To manufacture hard rubber, composition rubber and all kinds of insulation products.

Hudson Tire & Rubber Corp., April 19 (New York), $1,000,000. W. M. Doucette, president; H. B. Seymour, vice-president and treasurer; U. Wiesendanger, secretary. Principal office, 503 Proctor Building, Yonkers, New York. To manufacture and sell cord and fabric tires, etc.

International Tires Stores Corp., August 11 (Delaware), $50,000,000. T. L. Croteau; M. A. Bruce; A. M. Hooven—all of Wilmington, Delaware. To buy, sell, and generally deal in rubber tires, tubes and accessories.

Pittsburgh Rubber Sundries Manufacturing Co., July 21 (Delaware), $500,000. C. M. Blaske; M. A. Bruce; S. E. Dill all of Wilmington, Delaware. To manufacture and sell rubber and rubber products.

Pneumatic Rubber Heel, Inc., August 23 (New York), $100,000. A. Allenberg, 3 East 44th street, New York City; G. Loock, 23 18th street, Astoria, both in New York; A. Seiferth, Hasbrouck Heights, New Jersey. To manufacture rubber heels.

Quality Tire Co., July 30 (New Jersey), $50,000. J. J. Cooley, 34 Westfield avenue, Elizabeth; E. Feenane, 59 Sanhican Drive, Trenton; L. M. Ettinger, 459 High street, Newark—all in New Jersey. Principal office, 238 Halsey street, Newark, New Jersey. Agent in charge, F. J. Pfaff. To deal in automobile tires; distributer of Hood tires and tubes.

Rock Bestos Products Co., July 26 (Delaware), $5,000,000. C. H. Blaske; M. A. Bruce; F. E. Dill—all of Wilmington, Delaware. Asbestos products.

Sabbag's Rotary Rubber Heel Co., August 3 (Massachusetts), $50,000. L. G. Sabbag, 810 Saratoga street; N. G. Sabbag, 863 Saratoga street, both of East Boston; H. A. Kenny, 42 Moreland street, Roxbury—both in Massachusetts. Principal office, Boston, Massachusetts. To manufacture and deal in rubber and leather heels, etc.

Seattle Asbestos Factory, April 28 (Washington), $20,000. W. H., M. C. and John D. Chambers. Principal office, Seattle, Washington. To manufacture asbestos products.

Seeanbee Tire & Rubber Co., August 6 (Delaware), $10,000,000. V. P. and M. M. Lucey; M. A. Davis—all of Wilmington, Delaware. To manufacture and deal in rubber tires, tubes, stems, valves, shoes, etc.

Stahle Flex-Hub Wheel Co., July 21 (Massachusetts), $100,000. W. K. Beardsley, 9 Stratford street; J. F. Moloney, 41 Peterborough street, both of Boston; P. J. Fitzpatrick, 96 Reservoir avenue, Revere—both in Massachusetts. Principal office, Boston, Massachusetts. To manufacture and deal in wheels and tires for automobiles; also accessories.

Thames Tire Corp., July 30 (New York), $1,200. G. D. Smith, Bedford Centre; E. A. Jones, Nyack, both in New York; S. Richert, Atlantic Highlands, New Jersey. To manufacture rubber tires.

United Rubber Co., Limited, February 11 (Canada), $1,000,000. Charles H. and Leonard L. Stanyon; William B. and Norman B. McPherson; M. D. Gray—all of Toronto, Canada. Principal office, Toronto, Canada.

Youngs Rubber Corporation, August 9 (New York), $100,000. A. R. Chisholm, 10 West 61st street; S. A. Foote, 114 West 79th street—both of New York City; M. L. Youngs, 159 South Second street, Mount Vernon—both in New York. Principal office, 75-77 Spring street, New York City. To manufacture atomizers and molded rubber goods for the wholesale druggists' trade. Purchased business of Fay & Youngs, Inc., and of Fay & Youngs Rubber Corporation.

AMERICAN DUNLOP BUILDINGS NEARING COMPLETION.

WORK on the new Dunlop tire plant in the United States, to be operated under the name of Dunlop Tire & Rubber Co., is progressing very rapidly.

The site embraces 214 acres on River road, half a mile north of the city line, Buffalo, New York. Its location on the Niagara river insures adequate water supply and direct rail communication to all parts of the country. Electric current will come from Niagara Falls and Buffalo. Some steam power will be used, however.

The plant consists of nine factory buildings, 560 by 120 feet, and a warehouse four stories high, 546 by 162 feet, the whole providing a floor space of 30 acres. The factory buildings are one-story monitor type, of structural steel with concrete foundations, and the warehouse is of concrete. The plan shows an arrangement in groups, each of three parallel buildings so spaced that the capacity of the plant can easily be doubled by the addition of duplicate buildings. Employes will pass to their respective places through covered roadways connecting the buildings, materials and finished products being transported through the same

system. This arrangement is expected to increase the efficiency of tire manufacturing. There is a system of conduits or subways to carry water pipes, steam pipes and electric wires to all parts of the factory.

Exceedingly rapid construction is being attained, the first ground having been broken March 16; the first concrete poured April 7; the first steel erected April 26 and the roofing commenced about August 1.

An estimated capacity of 12,500 tires daily is being provided for. Cord pneumatics, including giant pneumatic truck tires and tubes, and also solid truck tires, will be made in all sizes, including Ford and motorcycle sizes. Present plans do not include the manufacture of fabric tires. Production will start very early in 1921.

A textile mill at Utica, New York, has been purchased where cord fabric for the new tire plant will be produced. In the near future a factory will probably be constructed as part of the Buffalo plant for the manufacture of Dunlop "Vac" golf balls.

Previous references in The India Rubber World to the new Dunlop plant have been made under the name Dunlop America Limited, which was incorporated in New York State December 5, 1919.

KENYON'S EASTERN SALES MANAGER.

Friends of Franklin G. Hill, who has taken over the eastern sales management for the C. Kenyon Co., Inc., Brooklyn, New York, say that he is big enough for the job, and perhaps the biggest man in the tire trade. As he stands six feet three inches and tips the scale at 255 pounds, none will dispute it. Quite apart from these facts, however, his experience has been such as to render him a big man in the tire trade in quite a different sense.

Franklin G. Hill.

A native of Bradford County, Pennsylvania, where he was educated in the public schools, commercial college and normal school, graduating in 1902, he began his career in the rubber industry with the Diamond Rubber Co. in 1905. The following year he went to the Continental Caoutchouc & Gutta Percha Co., of Hanover, Germany, and in 1907 took over the eastern distribution of Republic tires and tubes, becoming vice-president of the Republic Rubber Co. of New York and also of the Petler Shock Absorber Co.

Mr. Hill resides at Freeport, Long Island, and has been active in politics for several years in Nassau County. He is an Elk and a Mason.

PERSONAL MENTION.

F. C. Ryan, with the New York City office of the New Jersey Zinc Co., Inc., sailed on August 11 aboard the Grace liner *Santa Ana* for Valparaiso and other South American west coast ports.

C. E. Little has been appointed New York representative of the Tru-matic Tire & Tube Co., a Delaware corporation, with office at 106 Duane street, New York City.

A. F. Bearslag has been appointed New York representative for the Netherlands Corporation for Oversea Trade, Holland, capitalized at $5,000,000, with office at 220 Broadway, New York City.

Ernest Schulthess, a mechanical goods salesman well known in New York City, is a director in the United Tire & Export Co., 26 Cortlandt street, New York.

W. A. Brady has been promoted to the management of the New York branch of The McGraw Tire & Rubber Co., succeeding W. H. Hurley, promoted to assistant sales manager in Cleveland, Ohio.

Lloyd Appleton, for 13 years secretary of F. H. Appleton & Son, Inc., Boston, manufacturer of reclaimed rubber, and in charge of the company's New York office, recently resigned to devote himself to other interests. Mr. Appleton is very well known in the industry and many friends will miss his genial personality.

C. B. McKay, who looks after the crude rubber requirements of The Fisk Rubber Co., Chicopee Falls, Massachusetts, will leave Singapore for home about September 1.

Robert F. Whitehead has been appointed by President Wilson to the position of Commissioner of Patents of the United States, succeeding James T. Newton, who recently resigned. Melvin H. Coulston has been appointed First Assistant Commissioner of Patents. Both men have been on the staff of the Patent Office for more than eighteen years.

In Chicago recently, at a meeting of the Chemists' Club, George Slocum, who has been connected with the United States Rubber Co.'s plantations in Java and Sumatra for the last five years, gave an address on "Java and Its Rubber Plantations."

THE RUBBER TRADE IN THE EAST AND SOUTH.

By Our Regular Correspondent.

NEW YORK NOTES.

The Braender Rubber & Tire Co., Rutherford, New Jersey, has removed its export office from 32 Broadway to 132 Nassau street, New York City.

The Prospect Tire & Rubber Co., Buffalo, New York, has increased its capital from $500,000 to $1,000,000.

The Holly-Wood Chemical Co., 101 Beekman street, New York City, has just been established to deal in rubber makers' chemicals, pigments, and colors. These include sulphur, zinc oxide, talc, whiting, dry colors, antimony, etc. A. P. Gottfried, widely known in chemical circles, and S. F. Demant are at the head of the company that maintains branches in Baltimore, Philadelphia, Buffalo and San Francisco.

The shipping agency business established in New York City for nearly 60 years by Booth & Co. and Booth & Co., Inc., will hereafter be carried on under the name of Booth American Shipping Corporation, with offices at the same address, 17 Battery Place, and without change of management or personnel. The company operates steamers between Amazon river ports and New York.

The United States Rubber Co., New York City, has promoted F. J. Nute, formerly salesman at Portland, Maine, to the position of branch manager in the same city.

The business of the Fay & Youngs Rubber Corporation, and of Fay & Youngs, Inc., has been purchased by a newly incorporated company, Youngs Rubber Corporation, which will have its main offices at 75-77 Spring street, New York City. The officers are: Merle L. Youngs, president and treasurer; William McKinney, vice-president; and Jesse A. Cole, secretary. These are also directors, besides Messrs. John E. Conklin, Samuel A. Foote, A. R. Chisholm, and R. R. Carter. The company will manufacture atomizers and molded rubber goods for the wholesale druggists' trade.

The Multibestos Co., Walpole, Massachusetts, has established a branch office at 105 West 63d street, New York City, with Mr. Schacht as manager.

The Philadelphia Rubber Works Co., Akron, Ohio, has purchased a 100-acre tract of land adjoining the property of Dunlop

America Limited in Buffalo, New York, but will not develop the premises at present.

Jean Nehmelman has been appointed sales manager of Madison Tire & Rubber Co., Inc., New York. Sylvan E. Weil will continue as assistant sales manager. George Shortmeier has been appointed manager of the New York branch. All have been connected with the company since its inception.

The College Point Rubber Mold & Engraving Co., College Point, New York, has changed its name to "College Point Mold, Die Sinking and Engraving Co."

L. Littlejohn & Co., Inc., crude rubber importers, has removed its offices from No. 138 to Nos. 133-137 Front street, New York city.

Elbert & Co., dealers in oils, including cotton, coconut, palm, and copra, removed several months ago from 71 Wall street to 27 William street, New York City.

The Gordon Suspender Co., New Rochelle, New York, has increased its capital stock to the following: 150 shares preferred, par value $100; 150 shares common, no par value; $15,750 to carry on business.

CONNECTICUT NOTES.

The Seamless Rubber Co., New Haven, Connecticut, has purchased the dipped goods department of The Miller Rubber Co., Akron, Ohio, including household, surgeons' and acid rubber gloves, finger cots, dipped bathing caps styles Nos. 357 and 358, drainage gauze covers, dilator covers, and toy balloons.

The United States Rubber Co., New York City, has promoted L. W. Jerauld, formerly salesman in Boston, to the position of branch manager at the Hartford Rubber Works, Hartford, Connecticut.

Goodyear Cotton Mills, Inc., Goodyear, Connecticut, has canceled operations looking to the immediate building of a 500-foot spinning mill, and the structure will not be erected until some future date.

PENNSYLVANIA NOTES.

George W. Kavanaugh, Inc., manufacturer of fabrics for the rubber trade, has removed from 216 Chestnut street to 38 North Second street, Philadelphia, Pennsylvania.

The officers of the Prudential Tire & Rubber Co., 816 Commerce Building, Erie, Pennsylvania, include Fred A. Seiberling, president, and D. L. Stouch, secretary and treasurer.

The Southwark Foundry & Machine Co., Philadelphia, Pennsylvania, has increased its sales engineering staff by the addition of James T. Lee, formerly vice-president in charge of sales of the Hanna Engineering Works, Chicago, Illinois. The Southwark company is planning to add a full line of pneumatic and hydro-pneumatic riveters and foundry molding machines to its present line of hydraulic and power machinery, and thereby broaden its field of activity.

SOUTHERN NOTES.

The Continental Tire & Rubber Co., Gulfport, Mississippi, is now receiving machinery for its factory and expects to be in operation by October.

Fred B. Geary has been appointed branch manager of the Madison Tire & Rubber Co., New York City, with headquarters at 303 Peachtree street, Atlanta, Georgia.

The Delion Tire & Rubber Co., Baltimore, Maryland, has purchased the plant and equipment of The Dreadnaught Tire & Rubber Co. of the same city and will make extensive alterations and improvements. Considerable new machinery will be installed and it is expected that the plant will be in operation about the middle of November, producing Delion tires and tubes. The officers of the company are: John W. Price, president; W. C. Price, vice-president in charge of sales; R. B. Arnold, vice-president in charge of manufacture; and R. L. Swats, sales manager.

THE RUBBER TRADE IN NEW JERSEY.

By Our Regular Correspondent.

TRENTON TIRE MANUFACTURERS are experiencing a little slump in the tire market at the present time. This unusual condition is due principally to transportation difficulties. Owing to the shortage of freight cars the automobile manufacturers have been unable to secure needed materials, and were compelled to cancel orders for thousands of tires. As soon as this situation is remedied rubber manufacturers expect to receive large orders for tires and tubes. Business in the mechanical rubber goods trade has been very good for some time and manufacturers expect it to continue.

The Ajax Rubber Co. was the only Trenton concern forced to lay off a number of employes because of these conditions. The company has laid off about 250 tire makers, but according to officials of the company they will be put back to work within a short time. It is not thought by heads of other rubber concerns in Trenton that the situation will grow any worse in this section.

Two more Trenton rubber concerns have decided to enlarge their plants to take care of future trade. The Thermoid Rubber Co., which recently let a contract for a big addition to the plant in Hamilton township, will erect an additional story to the main plant. The new story will be 80 by 200 feet, of reinforced concrete and steel, and will cost $50,000. The Hamilton Rubber Manufacturing Co. will build a two-story addition to the plant on Mead street. The building will be 20 by 40 feet of brick and steel and will cost $15,000. The Joseph Stokes Rubber Co. has completed the erection of a steel water tank of 70,000 gallons capacity with a 125-foot tower. The Acme Rubber Manufacturing Co. recently let a contract for a big addition, and the Ajax Rubber Co. recently completed large additions.

The employes of the Essex Rubber Co. and the members of their families, numbering approximately 500, held an annual outing at Burlington Island Park recently. The rubber plant was closed for the day and the trip was made on a steamer on the Delaware River. There were various field and aquatic sports.

Some of the rubber factories of Trenton have suffered heavy losses through systematic thefts of tires during the past year and the police of Trenton now believe that they have put a stop to these wholesale robberies by the arrest of several young men. The Empire Rubber Co. alone lost nearly $3,000 worth of tires. How the tires were taken from the plants is a mystery. A tire concern at Perth Amboy, where the stolen goods were sold, was raided by the police and the proprietors arrested. The tires stolen were of the best grade and easily disposed of at the "fence" raided by the police.

The United & Globe Rubber Co. recently completed the erection of a new tower and steel tank with a capacity of 100,000 gallons of water. This is in addition to the company's other tanks and will give better service in case of fires in the future.

The Semple Rubber Co., Trenton, is completing a big order for tires for European dealers and expects more orders from abroad during the coming fall.

The Bergougnan Rubber Corporation, Trenton, New Jersey, has practically completed its plant additions which have been under construction for a number of months. These consist of a two-story unit of the same size and type as the other two main units of the plant, a warehouse, a rubber cement mixing and storage building, a machine shop, a carpenter shop, and a large garage and repair shop for motor trucks and passenger cars. The sidings which connect with the Pennsylvania railroad are also being improved as well as the facilities for handling and storing coal.

The Acme Rubber Manufacturing Co., Trenton, has broken ground for a new factory building, 90 by 300 feet, to be used

entirely for the manufacture of molded hose. It will be of concrete and steel construction and the company hopes to occupy it by November 1.

Capitalization of the Joseph Stokes Rubber Co., of Trenton, New Jersey, has been increased from $300,000 to $5,050,000 by the filing of a certificate with the Secretary of State amending the charter of the company. This increase in the capital of the Stokes company is in line with expansion of the business, which has grown tremendously in the last few years. The company recently purchased several properties on Taylor street for eventual plant extension. A modern office building is now being erected.

Harry Weida, vice-president of the India Rubber Co., New Brunswick, New Jersey, recently entertained the members of the office force with a motor trip to Asbury Park and other points along the New Jersey coast. The guests also enjoyed a shore dinner and a motor boat trip up the Shrewsbury River.

MISCELLANEOUS NEW JERSEY NOTES.

The Braender Rubber & Tire Co., Rutherford, New Jersey, has completed its new factory and is running at full production.

A. R. de Santos, of the Braender Rubber & Tire Co., has returned from a nine months' trip through Spain, Italy, Switzerland, Germany, France, Holland, Denmark, Norway and Sweden.

The Compound Belting Co., Nutley, New Jersey, has changed its name to the Maywald Rubber Co.

Dr. W. F. Zimmerli is now the chemist of the Howe Rubber Co., New Brunswick, New Jersey, devoting all his time to this organization.

The Michelin Tire Co., of Milltown, New Jersey, has protested to the town authorities about the proposed tax on jitneys carrying employes from their homes to the plant. The company carries nearly 1,000 persons daily in the jitneys and protests against paying a fee for each bus.

THE RUBBER TRADE IN MASSACHUSETTS.

By Our Regular Correspondent.

BOSTON NOTES.

Rubber companies were well represented at the National Shoe and Leather Exposition and Style Show held in Boston recently. The United States Rubber Co. showed Uskside soles and top lifts, also Spring Step heels. The booth was in charge H. A. Derry, and Miss Betty Marquis, a model, wore shoes of leading manufacturers on the style runway with Uskside and Spring Step products.

The Hood Rubber Co. booth was in charge of Mr. Shepard, and "The Red Man" and woman, models which were replicas of the well-known Hood sign boards, displayed a variety of rubber and fabric footwear, including a man's walking shoe of brown canvas; a military-heel house-shoe; a molded-sole basketball shoe; a one-strap shoe; a cross-strap shoe in brown; a white Flexipac shoe for coal miners; a pressure-cured black rubber boot with fabric lining made to withstand the action of acids and oils; and the Society gaiter with five eyelets, ribbon laced, of Jersey cloth in black with high heel.

The Goodyear Tire & Rubber Co. showed Neolin soles and Wingfoot heels, while the Wids Co. and the Foster Rubber Co., with William P. Noll in charge of the Cat's-Paw heel exhibit, were well represented.

The Converse Rubber Shoe Co. featured its Big Nine shoe for hard, everyday use, athletic sports and camping.

The Portage Tire Co. has moved to larger and better quarters at 805 Beacon street, Boston, the former Boylston street branch having proved inadequate to handle the increasing business in Skidlock tires. C. E. Aldridge is New England manager.

The B. F. Goodrich Rubber Co. recently removed its offices to larger and more spacious quarters in the firm's handsome fireproof building at 867 Boylston street. The Boston tire division is located on the first floor, with the administration offices on the second. The office of the district manager, F. T. Moore, is on the sixth floor, and surrounding him there, and on the fifth are the offices of the district sales executives. The fourth and third floors are occupied by the credit, bookkeeping and general operating departments.

The Davidson Rubber Co., Boston, in line with its policy of manufacturing only a few specialties of high grade, is featuring its line of rubber gloves, for the manufacture of which it maintains a complete dipped goods plant with modern equipment for making high-class goods.

F. H. Appleton & Son, Inc., Boston, has changed the name of the organization to Appleton Rubber Co. F. H. Appleton is president.

The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio, has appointed W. P. McGlynn its Boston representative, succeeding R. I. Winterringer, transferred to Cleveland.

The United States Rubber Co., New York City, has promoted J. P. Haney, formerly branch manager at Boston, to the position of district manager, and H. E. Crocker, formerly branch manager at Providence, to succeed Mr. Haney as Boston branch manager.

MISCELLANEOUS MASSACHUSETTS NOTES.

A two-day institute on industrial Americanization, conducted under the joint auspices of the Harvard Summer School and the Associated Industries of Massachusetts was held in Cambridge late in July. Members having, or contemplating, classes in English for alien employes, sent representatives and much of value in solving this great problem was developed by talks and discussions. Among the speakers were J. F. Tinsley, general manager, Crompton & Knowles Loom Works, Worcester, who spoke on "Methods and Achievements"; E. A. Fiesinger, educational director, Solvay Process Co., Syracuse, New York, who talked on industrial Americanization in the Empire State, and Miss Rose O'Toole, director of factory classes, United States Rubber Co., whose subject was "Factory Classes in Boston."

Owing to the impossibility of securing enough stitchers in Malden, the Converse Rubber Shoe Co. has established a stitching room at Concord, where 40 to 50 young women are now turning out better than 1,100 pairs of leather-trimmed tennis tops a day. The tops leave the Malden factory all cemented and go back from Concord completely stitched and eyeleted, ready to be lasted on. A regular truck service is maintained between the two places.

Among the Massachusetts industrial concerns which give their employes a week's vacation with pay are the Boston Rubber Shoe Co. and the Converse Rubber Shoe Co., both of Malden.

To relieve the New England coal situation manufacturers are being encouraged to use anthracite coal screenings mixed with bituminous coal. The Boston Woven Hose & Rubber Co., Cambridge, has gone one better and is burning 200 tons per week of wharf screenings mixed with bituminous coal. By utilizing this fuel the company has been able to haul the tonnage in trucks without resorting to open-top railroad cars.

The Monatiquot Rubber Works Co., reclaimer and manufacturer of "naturized" rubber, South Braintree, has completed a second siding on the east side of its extensive property, which will open it up for development. In addition, the company has storage space for one or two years' supply of coal. This is an insurance against a repetition of last winter's state of affairs when New England manufacturers were confronted with the danger of having to close down their plants because of lack of coal. The company now has all its executive and clerical offices installed in the new office building at South Braintree.

E. S. Kochkersperger, of the Hood Rubber Co., Watertown, has been nominated a member of the executive committee of the

Safe Roads Federation of Massachusetts by the Associated Industries of Massachusetts. The object of the Federation is to reduce highway accidents through education and arousing of public sentiment.

The new canvas shoe prices of the Hood Rubber Co., Watertown, effective August 2, show a general advance of 25 to 30 per cent over last year's prices.

The baseball team of the Apsley Rubber Co. Athletic Association, composed of factory workers of the Apsley Rubber Co., Hudson, Massachusetts, holds the record of winning 12 out of 13 games played this season, including those with teams from the American Rubber Co. and the Boston Woven Hose & Rubber Co., both of Cambridge, Massachusetts. The Apsley team has scored 118 runs to opponents' 32, and 159 hits to opponents' 73, while its batting average is .327 to opponents' .170. Norman has pitched nine games, winning eight, with a record of 104 strike-outs. Plouffe has pitched four games, winning all, with a record of 31 strike-outs.

APSLEY RUBBER CO. BASEBALL TEAM.

The season's entire output of men's one-buckle and four-buckle cashmerette gaiters at the Converse Rubber Shoe Co., Malden, is being made by the new machine-making process described recently in THE INDIA RUBBER WORLD. Constant experimenting with the machines and patterns has brought these shoes to the point where they are not only a commercial success, but they show wearing qualities superior to the hand-made arctic. The bulk of the output at the present time is the four-buckle shoe.

The Tyer Rubber Co., Andover, Massachusetts, has made a number of changes in its offices in No. 1 factory. More floor space has been added and better lighting arrangements installed. A conference room for committee sessions has also been added. The factory was closed from July 31 to August 9 for the annual vacation of the employes. An active campaign of education in safety will be conducted among employes during the next few months, the safety committee having been considerably increased and the work reorganized.

The President Suspender Co., Shirley, Massachusetts, has purchased a two-story factory and ten acres of land in Clinton, in the same state, and will equip the factory with looms for weaving elastic web, together with the necessary spoolers and warpers. It is hoped to begin production in September. This is the second shop acquired by the company in Clinton, a stitching room for finishing suspenders and garters having been established there a year ago. The officers of the company are: C. Fred Edgarton, president; David C. Lash, vice-president and general manager; and F. H. S. Hyde, vice-president. The company is also selling agent for the Knickerbocker Suspender Co.

Humphrey O'Sullivan of Lowell, Massachusetts, inventor of the O'Sullivan rubber heel, has been made a knight of St. Gregory the Great by the Pope. This honor recognizes the charitable work done by Mr. O'Sullivan for the Catholic churches of Lowell, and his many good deeds and acts of generosity.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

AUGUST saw the vacation period and the annual outing festivities attain their zenith for the year, it being a month marked by unusual social activities. Factory outings were one of the features and the reports from every one proclaimed the satisfaction and enjoyment which resulted from these respites from work.

The second annual outing of the overseers of the Hope Webbing Co., Pawtucket, was held July 24 at the Hummocks, in Hamilton. The party left the company's plant in automobiles at 9 o'clock, arriving at noon, when a luncheon was served, at which there were about 75 persons present. In the afternoon a baseball game was played, followed by a sports program, which included several races and exhibition diving. At the conclusion the gathering enjoyed an old-fashioned clambake.

A full-course Rhode Island clambake, athletic events, and a dance were features of the third annual outing of the Mutual Benefit Association of the Davol Rubber Co., at Emery Park, and attended by 250 members and friends. After lunch a baseball game was played, followed by the clambake in the afternoon and dancing. Prizes were awarded to the first and second place winners of the various events.

Another outing of importance was the third annual field day of the employes of the Tubular Woven Fabric Co., held at the grounds of the Warwick Club, July 31. A light lunch was served, followed by a course dinner in the afternoon and a baseball game and a program of sports. Music was furnished by an orchestra and dancing was enjoyed until 5 o'clock, when the party left the resort for Rocky Point and at 9 o'clock the return trip was made.

The fifth annual outling of the Revere Rubber Co., to Lake Pearl on July 31, was enjoyed by more than 1,500 employes. A variety of amusements was offered; competition in athletic events, prize dancing and riding in launches and on the merry-go-rounds. In the dancing contests Robert Clark and Miss Egan won the first prize in the waltz. The married men asserted their superiority over the bachelors in a baseball struggle and the solid tire department took the measure of the engineers' department in the tug-of-war.

The outing of the employes of the Atlantic Tubing Co., at Duby's Grove on August 7 was a success. The dinner was a big feature but there were many games that were decidedly interesting. The baseball game between the married and single men was won by the "free-for-alls." There was a tug-of-war and Harry L. Lippitt, who was playing host for the occasion, was captain of the winning side.

More than 3,500 employes of the Alice and Millville rubber mills of the Woonsocket Rubber Co. at Woonsocket and Millville, and of the Lawrence Felting Co., were the guests of the Woonsocket Rubber Co., mill management, at an outing on the company's recreation grounds off Fairmount street, Woonsocket, on August 7. The festivities began at 1 o'clock and ended at 6:30 o'clock. Early in the afternoon the Millville team defeated the Alice nine in a baseball game. Dancing was enjoyed on a dance floor erected in the grove, while a large number of booths of various kinds provided amusement and at some of them refreshments were distributed free.

The National India Rubber Co. has begun the operation of a plan by which visitors may be shown through the entire factory by Miss Dorothy Hillard, who has been appointed factory

guide. Factory employes are also allowed to take advantage of the services of the guide during working hours by making an appointment through the industrial relations bureau. During the past month many of the employes have taken full advantage of the privilege.

The new branch of the National India Rubber Co., of Bristol, that has been established in the old Perry Mill building on Thames street, Newport, began operations on Monday, July 26, about 75 employes taking up the work at the start. The branch will, for the present, make the tops for the shoes. Later a department will probably be established for the making of the shoes. A number of young women from the Bristol plant went to Newport to assist in getting the new plant under way and to give instructions.

Some months ago the I. T. S. Rubber Co., of Elyria, Ohio, brought an infringement suit before Judge Arthur L. Brown in the United States District Court for Rhode Island, against the United States Lace & Braid Manufacturing Co., of Auburn, R. I., declaring that a rubber heel as manufactured by the Rhode Island concern infringed on the patent rights of the plaintiff. Judge Brown issued an order stopping the defendant from the further manufacture of the heel in question. Since then the defendant has made certain modifications in the heels, and on July 27 asked permission of the court to manufacture them. The defendant was told by Judge Brown, in an opinion handed down from the bench, that he would not consider the new heel an infringement.

The Mount Hope Spinning Co. closed its mills at Warren, Rhode Island, at noon July 31 for a period of two weeks, not for lack of orders, however. By reason of the increasing business a new mill was erected last spring, but unforeseen obstacles prevented the machinery installation. During the shut-down the entire plan of the mill was changed as to the location of the machinery and much of that located in the old mill was transferred to the new one, and the new machinery brought overland by auto trucks from Taunton and Lowell, was set up in the old structure. When running in full the capacity of the concern will be more than doubled. The Mount Hope Spinning Co. manufactures yarn for automobile tire fabric, and has large orders on hand that ensure several months' steady business.

The Kielstone Rubber Co., a Massachusetts corporation, has leased the factories of the Lynn Rubber Manufacturing Co., Warren, Rhode Island, and has started operations. The sales department has been established at 11 High street, Boston, in charge of M. S. Klein, sales manager. The company is planning to increase the output of the rubber specialties made by the Lynn Rubber Manufacturing Co. several times, and, in addition, will make a high grade rubber heel. The new company expects to employ more help within the next 30 days, as soon as additional machinery and equipment can be installed. The officers and directors of the company are as follows: president, Eliston H. Bell; vice-president and sales manager, Myer S. Klein; treasurer, J. Everett Stone; secretary and clerk, Robert J. Holmes; directors, L. P. Bosworth, and E. K. Watson, Warren; R. J. Holmes, M. S. Klein, George Marsh, and E. H. Bell, Boston. Mr. Stone, treasurer of the company, will be in Warren and will have full charge of the manufacturing and business of the concern. J. W. Long, former president of the Lynn Rubber Manufacturing Co., is still with the new concern and will continue as superintendent in charge of the manufacturing. W. L. Castillo, former assistant purchasing agent of the Plymouth Rubber Co., is the purchasing agent of the Kielstone Rubber Co. and L. E. Libby has assumed the position of production engineer.

Work is to be started in a short time on a large addition to the plant of the American Wringer Co., Woonsocket. The extension will be on Pond street and is to be 182 by 66 feet with a projection in the rear, 28 by 30 feet. There will be one high story and one normal one, the height to be 45 feet. It will have steel frame, steel sash and brick walls and the work will cost approximately $100,000. A freight elevator will also be installed.

E. T. Richardson, formerly branch manager of the United States Rubber Co. at Portland, Maine, has been promoted to the position of branch manager at Providence.

Walter Smith, of New York, formerly commercial agent for the New York Central Railroad, has been appointed traffic manager for the National India Rubber Co., at Bristol. James Cruickshanks, who has been holding the position temporarily, has been appointed assistant superintendent of central stores.

PAUL W. LITCHFIELD, FACTORY MANAGER.

Paul Weeks Litchfield, vice-president and factory manager of The Goodyear Tire & Rubber Co., Akron, Ohio, has recently completed twenty years of service with the company and is as proud of the gold service pin presented to him as any veteran workman who has been similarly honored.

PAUL W. LITCHFIELD.

Mr. Litchfield is of New England extraction, having been born in Boston in 1875, educated in the public schools and English High School of that city and graduated from the Massachusetts Institute of Technology in 1896 with a B.Sc. degree in chemical engineering. He was first employed as a surveyor for the Massachusetts Metropolitan Park Commission. After six months he entered the employ of L. C. Chase & Co., Boston, manufacturer of tire and carriage cloth, which was his introduction to the rubber industry.

His next step came with a transfer to the New York Belting & Packing Co., Passaic, New Jersey, as foreman of the molded goods and packing departments. From there he went to the superintendent's chair of the International Automobile & Vehicle Tire Co., which later became the Michelin Tire Co., of Milltown, New Jersey.

In 1900 he became associated with The Goodyear Tire & Rubber Co. as factory manager, a position in which he has developed remarkable capacity under an ever-increasing burden of responsibility that now also includes the offices of vice-president and director, and president of The Goodyear Cotton Mills, Inc., Killingly, Connecticut.

Mr. Litchfield has been a keen student of the human element in factory management and his influence has made the Goodyear company a leader in the modern idea of industrial relations and welfare work. In 1915, at a banquet tendered him by the company on the occasion of his fifteenth anniversary with the organization, he presented a gift of $100,000 to be established as a welfare fund for the benefit of factory employes. He is a firm believer in the participation of labor in the management and ownership of large industrial plants, and the large number of Goodyear employe stockholders and the elective legislative body made up of employes and known as the Council of Industrial Relations to regulate shop affairs are but practical applications of

his theories. The outcome of this daring but apparently successful innovation is being watched with much interest by the entire industrial world. Goodyear Industrial University was also a child of his brain. It is not surprising, therefore, that he is as well liked and respected by those working under him as by his business associates.

Mr. Litchfield is a member of The Rubber Association of America, of which he was a director in 1917; a member of the Society of Automotive Engineers, before whom in 1915 he read a scientific and practical paper on "The Size and Inflation of Pneumatic Tires" that is still the standard treatise on that subject; and a member of the Rotary Club, Akron City Club, and Akron University Club, and a Knight Templar.

THE RUBBER TRADE IN OHIO.

By Our Regular Correspondent.

F. A. SEIBERLING, president of The Goodyear Tire & Rubber Co., and C. B. Raymond, vice-president of The B. F. Goodrich Co., recently reviewed the outlook for Akron, the rubber center of the world, for the official publication of the Akron Chamber of Commerce, and pointed out that the present lull in the trade is transitory and that the future appears brighter than ever before. The industry is based upon solid foundations and the fact that the number of automobiles in the United States and the world will be doubled within a few years makes these predictions safe.

C. B. Raymond said:

"We are facing facts. Akron business men foresaw months ago that these conditions were coming. They are prepared, and being prepared, will be able to weather the storm.

"Legislation for the special benefit of some, regardless of results to others; extravagance of the Government; crying demands for decreases in prices; reckless legislation looking towards the decrease in prices have brought their natural results. People stopped buying. Manufacturers were compelled to curtail.

"Akron will suffer less than many other cities. People may not be buying automobiles. But their old cars are running and are using up tires.

"The pendulum is bound to swing back. It was inevitable the present conditions should come. It is inevitable better conditions will return."

F. A. Seiberling said, in part:

"The business situation in this country is acute at this time, while adjusting to the shock of restricted credits applied by the Federal Reserve Banks and the effects of the railroad strike. Within a few months this extreme pressure will be removed, but the orderly process of deflation of war values will move quietly and steadily on the equilibrium.

"So far as Akron is concerned, we have reached bottom in the production of tires. Abnormal stocks over the country are being steadily absorbed and the curve of production within a few months will be steadily upward.

"Eight million cars are now running in this country; within five years this number will approximate fifteen million cars—all with tires, the major part of which must be furnished by Akron. The rubber industry is on a solid foundation, unsurpassed by any other industry in this country.

"This is the time for sensible optimism. Everyone who is conscientiously desirous of doing his duty to himself, to Akron, to his country, will, in a time like this, stand by the guns, keep faith, do more work, and keep cool."

George D. Bates, vice-president of the First-Second National Bank, said:

"It is the Federal Reserve banking system backed by the great banking institutions which is responsible for heading the nation from a wild orgy of spending back to the safe and sane path which will ultimately lead to the greenest pastures in which this country has ever found itself.

"Business was rushing wildly on. The end could only be a terrible precipice. Quietly the word went out credits must be curtailed. Inflation must stop. Expansion not absolutely necessary ceased, and over night the great country was headed from certain ruin back to the road leading to prosperity."

AKRON NOTES.

Although a general scarcity of coal has been evident throughout Ohio because of an Interstate Commerce Commission order compelling the sending of large amounts of coal to the Northwest via the Great Lakes, Akron has a good supply on hand and when that is exhausted the mines owned by the Akron companies will be able to supply the deficiency. Since the strike of last year the companies purchased and have operated mines in the coal fields.

The building of aircraft will not be deterred in Akron because of a fire of unknown origin which burned three machines in their hangar at the Wingfoot aviation station owned and operated by The Goodyear Tire & Rubber Co. The hangar has been repaired and new machines are being assembled to take the place of those destroyed. One of the machines, the D-1, recently described in THE INDIA RUBBER WORLD, belonged to the government at the time it was burned. No one was injured in the fire and the losses were covered by insurance.

Theodore E. Smith, editor of the "India Rubber Review," Akron, has been appointed a member of the Honorary Advisory Council of the Fifth International Exhibition of Rubber, Other Tropical Products and Allied Industries, to be held in London, England, in June, 1921.

The Firestone Tire & Rubber Co., Akron, recently took an inventory, giving employes a week-end vacation of two days.

Mark L. Felber, formerly editor of "The Press," has been appointed editor of "The Firestone Non-Skid," Firestone Park, Akron.

C. H. Sorrick and J. F. Cast, manufacturers' sales manager and assistant manufacturers' sales manager, respectively, of the Firestone Tire & Rubber Co., Akron, have qualified for admission to associate membership in the Society of Automotive Engineers.

In a letter sent to the tire trade early last month, The B. F. Goodrich Co. guarantees present schedules until November 1, stating that in the event of any unforeseen condition arising which would enable a general reduction in present schedules prior to November 1, they will stand back of their guarantee by protecting Goodrich dealers on all stocks on hand unsold at the time of such reduction which were purchased between the present date and November 1.

Frank A. Seiberling, president of The Goodyear Tire & Rubber Co., Akron, has been elected president of the Lincoln Highway Association, succeeding Henry B. Joy, who is leaving the United States for a year. This is Mr. Seiberling's second election to the office.

The Miller Rubber Co., Akron, has sold its dipped goods department to The Seamless Rubber Co., New Haven, Connecticut, due to increased demand for automobile tires. The company will continue to make its remaining lines of druggists' sundries and all other present lines of products.

The Firestone Tire & Rubber Co.'s athletics have been in charge of Paul P. Sheeks as athletic director for a number of months. He was responsible for the first undefeated football team at Wabash College.

Arthur H. Leavitt, who last autumn resigned from the sales department of The B. F. Goodrich Co., Akron, to accept a position as assistant sales manager of The Akron Rubber Mold & Machine Co., has been appointed general sales manager for The Amazon Rubber Co., Akron, thus resuming connection with the tire business.

CLEVELAND NOTES.

The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio, has promoted C. E. Pumphrey to the position of general

sales manager, succeeding H. M. Bacon, resigned. Mr. Pumphrey was formerly assistant sales manager and has been with the company seven years.

W. H. Hurley, formerly manager of the New York branch of the McGraw company, has been made assistant sales manager in Cleveland.

R. I. Winterringer, formerly the McGraw company's Boston representative, has been appointed in charge of the Cleveland territory, succeeding G. E. Bovis, promoted.

H. G. Couturier has been made sales promotion manager of the McGraw company at Cleveland, having been transferred from Chicago. This position is in a newly created department.

The United States Rubber Co., New York City, has promoted W. T. Irwin, formerly branch manager at Youngstown, Ohio, to the position of branch manager at the Cleveland office. C. L. Wood, formerly salesman at the Cleveland branch, is promoted to be branch manager at Youngstown.

The McElrath Tire & Rubber Co., Cleveland, Ohio, has appointed E. S. Curtis sales manager and W. D. Richards, factory superintendent. The H. B. Bixler Co. has been retained as consulting engineers. The company's new factory, 100 by 300 feet, is well under way and will have 45.000 square feet of floor space. Machinery equipment sufficient to make 1,000 cord truck tires will be installed, as the company will specialize in machine-made tires of this kind. The equipment has already been purchased. The premises cover 12½ acres of land in Ravenna, one of the suburbs.

The Advertising Managers Council of the Motor and Accessory Manufacturers' Association, comprising the executives of the principal companies interested in automotive equipment, will hold a convention at Camp Nela, Nela Park, Cleveland, Ohio, on Friday and Saturday, September 17-18, 1920. Tents will be erected to accommodate the visitors and sports will be enjoyed. It is expected that the recent developments in the automotive industry will make this meeting both interesting and important. E. C. Tibbetts, advertising manager of The B. F. Goodrich Co., Akron, Ohio, is chairman of the executive committee which is working on the program for the meeting.

MISCELLANEOUS OHIO NOTES.

The Dayton Rubber Manufacturing Co., Dayton, Ohio, through the disposition of $3,000,000 of preferred stock, is quadrupling its present plant capacity. The additions are being built in accordance with the original plan when the first unit was erected in 1917. The property covers 22 acres and the company has no bonds or mortgages of any kind on it. "Dayton Airless" and "Dayton Thorobred" cord and fabric tires are being manufactured. J. A. MacMillan is president.

The Lancaster Tire & Rubber Co., Columbus and Lancaster, Ohio, has appointed Richard Gibson, Jr., technical superintendent. He formerly held a similar position in the tire department of the Hewitt Rubber Co., Buffalo, New York, and has also been tire development engineer of the Republic Rubber Corporation, Youngstown, Ohio, and assistant chemist of the Racine Rubber Co., Racine, Wisconsin, and of the Kelly-Springfield Tire Co., Akron, Ohio.

The Akron Maderite Tire & Rubber Co., Newton Falls, Ohio, has changed its name to the Trumbull Tire & Rubber Co.

The Republic Rubber Co., Youngstown, Ohio, was closed down for six days in July, for the regular semi-annual inventory. The pneumatic tire department was shut down until August 16, when it resumed operations. All departments are now running.

The Mason Tire & Rubber Co., Kent, Ohio, has created a factory engineering department in charge of H. W. Sidnell. The entire staff of the department when fully organized will consist of from eight to ten men. E. B. Harvey is manager of the planning division, W. W. Peffers of the raw material department, and W. S. Agnst will have charge of the tire design department. As a result of the transfer of Mr. Sidnell from the office, A. J. Lauderbaugh has been promoted to the position of assistant secretary and office manager.

An eastern sales district, comprising all branches east of Indianapolis, has been created by The Mason Tire & Rubber Co., Kent, Ohio, in charge of Earl W. McCreery, with headquarters at the factory in Kent. Mr. McCreery was formerly assistant sales manager of the Portage Rubber Co., Barberton, Ohio.

E. K. McMillen has been appointed foreman of the milling department, in charge of mills and calenders of The Mason Tire & Rubber Co., Kent, Ohio, succeeding H. L. Parsons. Mr. McMillen has been connected with the rubber business 17 years, and was formerly with the Firestone Tire & Rubber Co. and The B. F. Goodrich Co., Akron. He comes to the Mason company from the New Castle Rubber Co., New Castle, Pennsylvania.

E. H. Lybrook, for the last year in charge of the electrical construction work of the United States Nitrate Plant, Toledo, has been appointed chief electrician of The Mason Tire & Rubber Co., Kent, Ohio, succeeding the late George J. Murray. Mr. Lybrook has had ten years' experience in electrical work, and is a graduate of Purdue University.

The Allied Belting Co., Greenville, Ohio, has increased its stock from $60,000 to $100,000, and will move its factory from Toledo to Greenville, where it is now building a factory to cost approximately $25,000. George C. Baker is vice-president, and W. R. Graham is factory manager.

THE MID-WEST RUBBER ASSOCIATION'S GENERAL MANAGER.

Harry Stephen Vorhis, who until July 1 of last year was secretary and treasurer of The Rubber Association of America, when he resigned and joined the Gutta Percha & Rubber Manufacturing Co., of New York, and later was made general manager and secretary of the Mid-West Rubber Manufacturers' Association, is well known to nearly everybody in the rubber trade through his former close connection with the industry.

Harry S. Vorhis

Mr. Vorhis brings to the Mid-West Rubber Manufacturers' Association a broad experience that peculiarly fits him for the work. Under his able management this young association may be expected to redouble its already sturdy stride, for it is growing rapidly. Since Mr. Vorhis assumed his duties in February, fifty new members have been added, making a total of 132, and a "live wire" bulletin service has been inaugurated. Attendance at monthly meetings has increased from about thirty to sixty members and a spirit of friendly cooperation and enthusiasm is being manifested. Both Mr. Vorhis and the Association are to be congratulated.

THE RUBBER TRADE IN THE MID-WEST.

MID-WEST RUBBER MANUFACTURERS' ASSOCIATION OUTING.

The first annual outing of the Mid-West Rubber Manufacturers' Association, held at the Hotel Breakers, Cedar Point, near Sandusky, Ohio, August 16-17, was an unqualified success as to attendance and enjoyment. Many rubber men from Ohio accepted the hearty welcome of the Westerners and were amply repaid in the coin of good-fellowship that freely circulates among the rubber men.

An enjoyable dinner was held in the hotel pavilion on Monday evening and on Tuesday morning there were beach sports. The swimming race was won by O. A. Ragsdale of the Hunter Dry Kiln Co., the prize being a golf bag. The fat man's race was won by E. S. Babcox of the Akron Advertising Agency Co., the prize being a silver pen and pencil. The wheelbarrow race was won by K. Hassenzahl, Akron representative of Gove & French and Mr. Rodenbough, Akron representative of F. R. Henderson & Co., the prize being a pin-seal bill-fold to each winner. The fifty-yard dash was won by Henry O'Reardon, advertising manager "Tires," New York City, the prize being a silk umbrella.

Luncheon was held immediately after the sports, after which there was held a brief business session, presided over by Theodore E. Smith of "The India Rubber Review," Akron, Ohio, who addressed the meeting on present conditions in the trade. Jesse E. LaDow, secretary of the Mansfield Tire & Rubber Co., Mansfield, Ohio, gave an interesting account of his travels through the countries of crude rubber production in the Far East. E. S. Babcox, of Akron, said that, while present dull conditions in the tire trade had seemed inevitable, he believed that better business was in store for the trade this coming winter. Interesting remarks were also made by J. E. Allen of the Braender Rubber & Tire Co., Rutherford, New Jersey, Henry O'Reardon of "Tires," Mr. Ragsdale of the Hunter Dry Kiln Co. and by W. F. Harrah of the National-Standard Co., Niles, Michigan.

The following new regular members were elected: Sterling Tire Corporation, East Rutherford, New Jersey, and Hubbell Tire & Rubber Co., 6545 Carnegie avenue, Cleveland, Ohio; new associate members—Cabarrus Cotton Mills, Kannapolis, North Carolina; Edward Lyman Bill, Inc., publisher of "Tires," 373 Fourth avenue, New York City; Akron Industrial Salvage Co., Akron, Ohio; Hunter Dry Kiln Co., Indianapolis, Indiana; Keystone Lubricating Co., Philadelphia and Pittsburgh, Pennsylvania, and National Aniline & Chemical Co., Inc., Akron, Ohio.

A vote of thanks was then passed to the outing committee, consisting of the following: H. S. Vorhis, chairman, who is general manager of the Association; E. T. Meyer of F. R. Henderson & Co., Chicago, Illinois; Paul A. Bloom of Fred Stern & Co., Chicago, Illinois; C. H. Taveniere of Charles E. Wood, Chicago, Illinois; and J. Matthias, Jr., of Mineral Point Zinc Co., Chicago, Illinois.

MISCELLANEOUS MID-WESTERN NOTES.

The A. Plamondon Manufacturing Co., 24 North Clinton street, Chicago, Illinois, is constructing a two-story building at 5301 South Western avenue for pattern storage, as an addition to its new plant into which it expects to move about October 1. J. T. Benedict is treasurer of the company. Shafting, pulleys, clutches, and machine-molded gearing are manufactured.

The officers of the International India Rubber Corporation, South Bend, Indiana, are: George W. Odell, president, treasurer, and general manager; Peter E. Studebaker, vice-president. John C. Witmer is factory manager. The plant is located on the Pennsylvania-Vandalia railroad within the city limits, and the factory buildings are of brick and steel construction. The plant is working night and day producing Odell cord and South Bend fabric tires. A description of the Odell cord tire appeared in our June issue.

The Wawasee Tire & Rubber Co., Syracuse, Indiana, is completing plans for an H-shaped three-story building, each side of the H being 50 by 175 feet and the cross-piece 50 by 60 feet. The power-house, to be separate, will have four 300-horse-power boilers, generators, pumps, a Fairfield coal unloader, automatic sprinkling tank, and two large benzine storage tanks. It is expected that work on the factory will begin soon, and that it will be completed by next spring. The company will specialize in tires and tubes, high-voltage electricians' and acid gloves, etc.

F. R. Granger, formerly head of the service department of the Pennsylvania Rubber Co., Jeannette, Pennsylvania, has been appointed general sales manager of the Fort Wayne Tire & Rubber Manufacturing Co., Fort Wayne, Indiana. The company is now placing on the market the "Wayne Rough Shod" and ribbed tread tires in fabric construction and expects to be in full production of cord tires also by the first of next year. The concern also makes "Wayne Supertested" red and gray inner tubes.

The Altenburg Tire Equipment Co., Davenport, Iowa, has voted to increase its capital stock from $25,000 to $50,000, to take care of increased business. A new factory site on the Rock Island railroad has been purchased in West Davenport, consisting of 6½ acres, and the foundries and machine shops of the new plant are under construction and expected to be ready for occupancy by September 1. The company manufactures a complete line of tire-building stands, machines, and molds used in the manufacture of tires.

The Columbia Rubber Mills, 176 16th street, Milwaukee, Wisconsin, has bought the plant of the Joerns Manufacturing Co. at Sheboygan, Wisconsin, and will remodel it to be approximately 60 by 140 feet, two stories high, of reinforced concrete. There will be several smaller buildings, also. The equipment will include a general line of rubber machinery, such as calenders, presses, washing machines, tube mills, vulcanizers, mills, etc. Leo Hofmeister is president of the company as well as of the Tomah Rubber Works at the same address.

The Prudential Tire & Rubber Co., Erie, Pennsylvania, has taken over the plant and equipment of the Boone Tire & Rubber Co. at Chippewa Falls, Wisconsin, and is reported to have filed articles of incorporation in that state, with George N. Graham designated as agent.

The Detroit Insulated Wire Co., 641 Wesson avenue, Detroit, Michigan, has contracted for a three-story office building of reinforced concrete.

A western sales district has been created by The Mason Tire & Rubber Co., Kent, Ohio, in charge of H. C. Smith, formerly manager of the Kansas City branch, with headquarters at Kansas City, Missouri. This district will include all branches west of the Mississippi river and the Chicago, Milwaukee, and Indianapolis branches east of the Mississippi. W. S. Deamud succeeds Mr. Smith as manager of the Kansas City branch. He has been with the Mason company as salesman for three years, traveling out of Chicago.

C. H. Connelly has been appointed southwestern manager of The Rubber Products Co., Barberton, Ohio, with headquarters at 2615 Walnut street, Kansas City, Missouri, where George B. Krestinger has also been appointed office manager.

The Terrell Tire & Rubber Co., 1512 McGee street, Kansas City, Missouri, which was incorporated under the laws of Delaware in April to manufacture the Fabri-Cord tire, inner tubes, etc., expects to start production at an early date. The officers are: A. C. Terrell, president and general manager; Otto W. Croy, vice-president; R. L. Meierhoffer, secretary and treasurer; directors—H. F. Zahner and George B. Duden, in addition to the officers.

W. H. Salisbury & Co., Inc., Chicago, Illinois, has just equipped a rubber mill at 411-421 North Morgan street, for the production

of molded and cut rubber goods, tubing, etc. The mill has been in operation about three weeks. The leather belting department of this company will also be under the same roof, thus placing the whole business under centralized supervision.

The Schmelzer Arms Co., Kansas City, Missouri, manufacturer of sporting goods, has moved into its new wholesale building at 2015-2019 Grand avenue, the retail location remaining changed. The company has also changed its name to "The Schmelzer Company," but the organization and personnel will continue as before.

Morton L. Paterson, one of the directors of the Converse Rubber Shoe Co., Malden, Massachusetts, and manager of the company's Chicago sales branch, returned on August 24 from a six weeks' vacation in Scotland.

The Steam Bag Corporation, 1545 Broadway, Denver, Colorado, has been incorporated in that state, with a factory at 1222 Elati street, Denver, to manufacture the "20th Century Steam Curing Bag" for vulcanizing tires. The company holds patents on the device covering the United States, Canada, Great Britain, France, and Germany.

R. L. DeVoe has been appointed Chicago branch manager of the Madison Tire & Rubber Co., New York City, with headquarters at 1606 South Michigan avenue.

The Hunter Dry Kiln Co., Indianapolis, Indiana, has just completed a plant addition of brick and steel construction, approximately 105 by 85 feet, especially designed for the manufacture of its latest improved dryer. This device is made entirely of metal with the exception of its insulation, and because of its simplicity of construction and operation is in demand for export as well as for domestic trade. The company is also adding to its facilities for manufacturing the metal racks and trays which are used with this dryer.

The Strongcord Tire & Rubber Manufacturing Co., Evansville, Indiana, has increased its capital stock from $250,000 to $1,250,000. R. G. Schultheis is secretary, and the offices and sales rooms are at 413-414 Mercantile Bank Building.

The Federal Rubber Co. of Illinois, Cudahy, Wisconsin, which had planned a $1,000,000 factory addition, to be six stories and basement, has postponed building until next year, on account of present conditions and the difficulty in getting delivery of steel before winter. It is expected that building operations will begin in the early spring, contingent on conditions at that time.

The plant of the Kansas City Tire & Rubber Corporation, Kansas City, Kansas, placed in the hands of receivers on May 24, 1919, has been leased to the A. J. Stephens Rubber Co. of the same city, which has also purchased all the liquid assets of the company. The plant is being operated on full time, manufacturing tires and inner tubes, and the Stephens company plans soon to add two night shifts in order to run 24 hours daily. The company also manufactures accessories and fabric products, some of which have been described in recent issues of The India Rubber World.

G. E. Bovis has been transferred to Chicago to represent The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio, succeeding H. G. Couturier, transferred.

Resolutions against the compulsory adoption of the metric system were passed by the Society of Automotive Engineers at the recent business session held at Ottawa Beach, Michigan.

The Century Rubber Works, Chicago, Illinois, which some time ago effected the sale of its plant to the Zeglen Tire & Rubber Co., Inc., 118 North La Salle street, in the same city, for the purpose of manufacturing tires, has built a larger plant for its own use, into which it expects to move at an early date.

THE RUBBER TRADE ON THE PACIFIC COAST.

By Our Regular Correspondent.

Although still handicapped with a shortage of skilled labor and slow deliveries of needed machinery and supplies from the East and Mid-West, the rubber manufacturers on the Pacific Coast are making good progress in overtaking unfilled orders. All report general business conditions good and are cheerful about the outlook for the remainder of 1920. Efforts are being made continually to facilitate direct shipments of plantation rubber, and there is some talk of forming a manufacturers' purchasing agency to take over the business hitherto done largely by import brokers. Something may develop along this line in the near future.

Rubber mills which have been supplying tread stock to tire repair men on the coast were much relieved by the easing up of the gasoline shortage. During the two months of "gas" scarcity the bottom fairly fell out of the tread stock trade, as automobile owners, being unable to use their machines, deferred repair work until they could get more use of their cars.

The Western Rubber & Supply Co., 1011 South Olive street, Los Angeles, has been appointed southern California and Arizona distributor of Gillette chilled-rubber tires and tubes.

Many southwestern dealers in solid rubber tires intend to have exhibits at the tractor show (said to be the only one to be held in the United States this year) September 20-26 at Glendale, a suburb of Los Angeles.

In accordance with its new country-wide policy, the Miller Rubber Co., Akron, Ohio, through its subsidiary, the Miller Rubber Co. of California, has taken over the direct distribution of Miller tires throughout southern California. J. O. Ward is branch manager.

Distribution of the products of the Columbia Tire & Rubber Co., Columbianna, Ohio, will be made in California and Arizona by the Lichtenberger-Ferguson Co., of Los Angeles, and San Francisco, a leather firm which took up rubber goods a few years ago.

LOS ANGELES NOTES.

The Garlock Packing Co., Palmyra, New York., has opened a branch office in the Higgins Building, N. Main and Second street, Los Angeles, in charge of Frederick A. Griffith, son of the vice-president of the Garlock Co. An extensive stock of rubber and asbestos specialties will be carried at the new southwestern distributing station.

The Auto Tire Manufacturers and Jobbers' Association has been recently formed by tire men for the purpose of correcting the abuses prevalent in the tire trade of Los Angeles. Frank T. Price is president and Alfred E. Adams, secretary. The other officers and directors are: J. R. Campbell, Roy R. Meads, Frank Osler, W. A. Rix, Adolf Schleicher, A. J. Straney, L. S. Utter, and J. B. Wood The offices are at 903-904 Broadway Central Building, 424 South Broadway, Los Angeles.

A. Roy Knabenshue, of Los Angeles, California, has obtained the exclusive agency for Lehigh tires and tubes in southern California.

A native of Ohio, where he was born in 1876, Mr. Knabenshue has had a varied business career in the East, West and Middle West as a telephone engineer, designer of automobile accessories, balloonist, pilot and builder of dirigibles and manufacturer of inner tubes. In 1916 he obtained an order from the Air Service for a special spherical balloon and twenty-five observation balloons. He then organized the Knabenshue Manufacturing Co. and leased a factory at Northport, Long Island, where this government contract was completed. In 1919 he purchased the factory and equipped it for making Knabe inner tubes, which business he sold out in February in order to return to California.

Dr. Wayland A. Morrison has been chosen as consulting surgeon for The Goodyear Tire & Rubber Co., of California, Los Angeles, and will assist Dr. Louis D. Chaney, chief of the staff of the hospital which the company maintains in its factory.

The Holland-American steamship line will begin regular sailings this Fall via the Panama Canal between Los Angeles harbor and Boulogne, Rotterdam, and Plymouth. The trip from Los Angeles to the first port of call in Europe, Plymouth, will take thirty-five days. Ample accommodations, it is said, will be provided for freight and passengers.

J. Elden Shaw has been appointed Pacific Coast manager for the Standard Four Tire Co., Keokuk, Iowa, with headquarters at the Los Angeles branch, of which he will also have charge. Mr. Shaw was formerly sales manager of The Savage Tire Sales Co., San Diego, California.

Owing to the demand for Grow tires in the West and the railroad situation, the George Grow Tire Co. of Boston will erect another factory at Los Angeles, California. Four representatives of the firm are now on the Pacific Coast, prepared to negotiate for a site for the new plant.

SAN FRANCISCO NOTES.

C. E. Cook, head of the mechanical goods sales department of The B. F. Goodrich Co., Akron Ohio, has been a guest of W. T. Powell, San Francisco district manager. Mr. Cook opened and conducted the San Francisco branch until he was called to a higher position in Akron.

The Eastern Manufacturers' Co., 312 Clay street, San Francisco, has been appointed Pacific Coast distributers of the Parco inner tires made by the Pan-American Rubber Co., Milwaukee, Wisconsin.

The Kern County Cotton Growers' Association, the first to be formed in central California, was organized August 8, at a meeting of cotton growers in Bakersfield, in which the office will be located. Picking prices at 2½ cents a pound for the short and 4½ cents for the long-staple cotton were decided upon. Kern county has 10,000 acres planted to cotton, this being the second season; and about 15,000 acres are planted to cotton in other San Joaquin Valley counties.

Jesse J. Hawkins has resigned his position as manager of the rubber footwear department of the San Francisco branch of the United States Rubber Co. to take charge of the rubber footwear department of the wholesale house of Cahn, Nickelsburg & Co., San Francisco. He was transferred to San Francisco two years ago to take charge of the C. R. Winslow branch of the United States Rubber Co., which was recently consolidated with the San Francisco branch.

SOUTHWESTERN NOTES.

Fully 15,000 acres of long-staple cotton, largely contracted for long in advance by makers of rubber tires, are under cultivation in Imperial Valley, California, and the crop prospects are excellent. The entire valley lies wholly below sea level and is irrigated by a canal from the Colorado river. The valley cities of Calexico, Brawley, and El Centro have experienced a remarkable boom, as evidenced by the census returns showing growths of 681, 512 and 239 per cent., respectively, in the past ten years. The prospects are for a greatly increased acreage in cotton next year, with prices well sustained.

Ground has been broken at Downey, California, by the West Coast Asbestos Co., a subsidiary of the E. M. Smith Co., Los Angeles, for a factory in which will be made a large variety of rubber-asbestos articles. On the tract of nine acres bought by the company a first mill unit will be erected, measuring 100 by 400 feet, half of which will be two stories high. This building, with machinery for crushing, spinning and weaving asbestos for brake linings, clutch facings, packing, etc., will mean an expenditure of $250,000, it is stated. Heavy oil and fire hose will be a specialty of the new concern, which will employ 150 men at the start.

A project for developing eighty sections in the Pecos Valley, Texas, for sulphur is being launched by a Los Angeles concern known as the Consolidated Sulphur Co., of which E. Barner, of Pecos, Texas, is the local representative. It is claimed that large deposits of sulphur, rivalling in extent those in Louisiana, exist in the Pecos Valley and that mining can be carried on at a small cost.

The Coahuila Rubber Co., a Detroit concern, has an experiment station, near San Jacinto in Southern California, devoted to raising guayule. The guayule plants are about half matured and, it is said, quite as satisfactorily as any similar growths below the Mexican border. The resident manager is J. G. Evans.

The United States Rubber Co., New York City, has promoted G. W. Manchester, formerly branch manager at Kansas City, to the position of district manager at Dallas, Texas, succeeding W. F. Gordon, resigned.

NORTHWESTERN NOTES.

James E. Haab, formerly factory representative of The Rubber Products Co., Barberton, Ohio, has been promoted, in charge of sales in the northwest district.

The Puritan Rubber Co., Inc., 16-17 Wilson Building, Yakima, Washington, has begun the construction of a $500,000 tire and rubber factory to manufacture "Pathfinder" tires and tubes, and mechanical rubber goods. The officers are: F. C. Plouf, president and treasurer; L. W. Hobson, vice-president; and O. P. McElmeel, secretary.

The Occidental Rubber Co., Everett, Washington, has finally started its tire factory, after much delay due to slow deliveries of machinery; and it expects within a few weeks to be running well into quantity production.

The Western Diatomite Co., Lumber Exchange building, Portland, Oregon, of which J. W. Ganong is president, is having a warehouse built at its mines at Terrebonne to hold 20,000 sacks or 30 carloads of the white siliceous mineral powder which it sells in large quantities to manufacturers of insulation material. From another large mine at Harper, also in Oregon, a considerable and increasing amount of diatomaceous earth is supplied to many rubber mills.

THE TIRE IN-SOLE.

The "Mile Multiplier" is the name bestowed upon the new tire in-sole, a heavy, crescent-shaped, endless cushion of tough resilient rubber, with breaker strip on its outer surface, which is said to neutralize the conflicting forces that work destruction on a tire. It is made thick on the center and graduated down to a feather edge. No special preparation is required for its use—it is inserted between the casing and inner tube. It is covered by a guarantee against punctures, and prevents blow outs. It is claimed to outlast the life of several tires. (Tire In-Sole Manufacturing Co., Findlay, Ohio.)

THE "VULPA" TUBE AND PATCH.

"Vulpa" is the name given to the extra heavy red inner tubes manufactured by a New York firm, and likewise to its self-vulcanizing patch for inner tubes. This patch is applied to the repair in the usual way, and it is claimed that vulcanization takes place through the frictional heat of the running car. It is also claimed that the Vulpa patch will repair a cut of any size in a tube, and can likewise be used as emergency repair for blow-outs and cuts in casings, as well as for other rubber articles. (W. E. Spencer Co., 1 Park Place, New York City.)

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

(820.) An exporter inquires for the name and address of the manufacturer of "Samson" rubber soles.

(821.) Request is made by a rubber company for the addresses of concerns who could utilize used tire casings in carload lots.

(822.) A rubber manufacturer asks for the address of a company manufacturing a machine for sifting compounding ingredients.

(823.) Inquiry is made for the address of the manufacturer of a machine for inflating toy balloons.

(824.) A foreign correspondent asks for the name of the American manufacturer of derivatives of furfural, as furfuramide and furfuraniline used as accelerators, and also desires to know the American names of these chemicals.

(825.) A subscriber requests the address of the manufacturer of the Diamond wire wrapper for winding hose with wire.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Requests for each address should be on a separate sheet, and state number.

District Offices.

New York: 734 Customhouse.
Boston: 1801 Customhouse.
Chicago: 504 Federal Building.
St. Louis: 402 Third National Bank Building.
New Orleans: 1020 Hibernia Bank Building.
San Francisco: 307 Customhouse.
Seattle: 848 Henry Building.

Cooperative Offices.

Cleveland Chamber of Commerce.
Cincinnati: Chamber of Commerce; General Freight Agent, Southern Railway, 96 Ingalls Building.
Los Angeles: Chamber of Commerce.
Philadelphia: Chamber of Commerce.
Portland, Oregon: Chamber of Commerce.
Dayton, Ohio: Dayton Chamber of Commerce.

(33,377.) A merchant in Norway desires to secure an agency for the sale of dress shields. Quote c. i. f. Norwegian port. Payment through banks.

(33,378.) A commercial agent in Canada desires to secure an agency for the sale of fountain pens. Quote f. o. b. American ports. Payments cash against documents.

(33,383.) A banking institution in Czechoslovakia desires to purchase 200 tons of asbestos for immediate shipment. Subsequent orders to amount to 400 tons annually. Quote c. i. f. European port. Payment cash in United States currency. Correspondence in Czechic, German or French.

(33,391.) A commission agent in Poland desires to secure an agency for the sale of rubber goods.

(33,411.) A commercial agent in Poland desires to secure an agency for the sale of balata belting, and rubber goods and packings. Correspondence may be in English.

(33,423.) A commercial agent in Cuba desires to represent manufacturers on a commission basis for the sale of tires.

(33,495.) Tenders are now being received by the chief of the fire department of a city in Canada for fire hose.

(33,506.) A firm in Argentina desires to secure an agency for the sale of rubbers used for motor cars. Correspondence may be in English.

(33,526.) A merchant firm in France desires to secure an agency from manufacturers for the sale of pneumatic tires. Correspondence should be in French.

(33,531.) A commercial agent in Austria desires to secure the representation of firms for the sale of American goods, including rubber manufactures, in that country.

(33,498.) A firm of merchants in Hungary desires to purchase rubber and asbestos goods.

(33,452.) An American exporter representing large European concerns, and who has connections in South America and other parts of the world, desires to secure representation for the sale of tires.

(33,550.) A firm of importers in India desires to be placed in communication with manufacturers and dealers in rubber-stamp-making machines and appliances.

(33,554.) An agency association in the Netherlands desires to get in touch with manufacturers who are not yet represented in that country, with a view to securing exclusive agencies for the sale of rubber hose for technical purposes.

(33,557.) A firm in Belgium desires to secure the general representation for the sale of tires for bicycles, motor cycles, automobiles and trucks; also automobile accessories.

MISCELLANEOUS FOREIGN NOTES.

TYPKE & KING, LIMITED, Mitcham Common, Surrey, chemical manufacturers, is represented in Manchester by W. Harrison & Co., Limited, 14 Market Place, where J. G. Thurston, a director of the company, gives personal attention to inquiries from the rubber trade. The previous agency arrangement with Louis Minton, Trevelyan Buildings, Corporation street, Manchester, were terminated last April and the new agency connection became effective May 1 last.

The Society of Motor Manufacturers and Traders will hold its next motor exhibition towards the end of the year at the White City and Olympia. It is expected to be the largest display of motors ever held, not only in England, but on the Continent and in the United States as well.

A joint committee of British and American authorities has proposed to limit the weight of golf balls to 1.62 ounces, and the minimum diameter to 1.62 inches. The recommendations will come up for final consideration in September.

Milledge Brothers, Melbourne, Australia, will act as agents in Victoria for Mason tires. This territory includes the city of Melbourne and a number of important towns in southeastern Australia.

Muggli & Rieser, 93 Bahnhofstrasse, Zurich, Switzerland, have undertaken the sales of Mason tires and tubes in that country and expect to introduce them into Germany as soon as such imports are allowed by the German Government.

Rubber manufactures valued at $211,653 were shipped to South Australia during 1917-18, compared with $286,412 in 1916-17. There was also a decrease in asbestos packing, $11,110 in 1916-17 as against $8,973 in 1917-18. The export trade of South Australia suffered an even more serious decline from that of the previous year than did the import trade.

The Swedish importing concern, known as A. B. Orion Rubber Import Co., has voted to increase its capital from 150,000 to 300,000 kroner by issuing 1,500 shares at par.

The Askim Rubber Co. has been established at Askim, Norway, to manufacture rubber shoes and automobile tires. The capital stock amounts to 1,000,000 kroner, entirely paid in.

THE STRIKES AND LABOR TROUBLES IN THE RUBBER MILLS OF CLERMONT-Ferrand, France, have been settled. The plant of Establissements Bergougnan is operating to full capacity and has been little affected by the recent labor troubles under which French industry has been suffering. The plant is somewhat behind on orders, as it has been since the signing of the armistice, and the Italian plant of the firm and the Bergougnan Rubber Corporation of Trenton, New Jersey, are helping to fill foreign orders.

ON THE LIST OF GOODS WHICH, ACCORDING TO LATEST INFORMATION, can be exported from Italy only under license, appear carnauba wax, ceresine, crude rubber and gutta percha, and reclaimed and waste rubber, including worn out rubber articles.

The Rubber Trade in Great Britain.

By Our Regular Correspondent.

THE PEACHEY VULCANIZATION PROCESS.

On July 7, at the Grand Hotel, Manchester, Louis Minton gave a luncheon to a number of representatives of the rubber manufacturing and allied industries to meet S. J. Peachey, who it was announced would give a description of his new vulcanization process. The chairman proposing Mr. Peachey's health said he thought the gathering was unique in the annals of the British rubber trade and suggested that an organization somewhat on the lines of The Rubber Association of America would prove of interest and importance. He had no financial interest at all in the new process, but having had from the trade many inquiries concerning it he had conceived the idea of inviting Mr. Peachey to make any explanations he thought fit.

Mr. Peachey, in rising to respond, said that he did not propose to give an account of his process, as he presumed it was sufficiently well known by that time to the practical men he saw before him, and he would therefore merely adopt the rôle of answering criticisms, constructive or destructive as the case might be, on his process, which he wished to state emphatically is not a "stunt."

Prominent among those who took advantage of the opportunity to learn more about the process and its potential applications were J. K. Burbidge of Warne & Co., Limited, Tottenham; F. J. S. Gray, of St. Helen's Cable & Rubber Co., Limited; A. E. Salmon, of Chess & Stead, Limited; and Mr. Gibson, of Turner Bros. Asbestos Co., Limited.

The points raised related largely to the manufacture and application of the two gases and to the application of the process to molded goods, such as buffers. Rubber cable insulation, asbestos jointing and waterproof textures also came up for discussion. Naturally at this stage of affairs the patentee is not ready with cut and dried details of procedure with regard to the large and diverse number of goods which the rubber manufacturer produces and he did not hesitate to say so. In some cases which had special mention he said that experimental work was in progress and he was not at the moment prepared to say anything by way of elucidation. With regard to pneumatic tires the present position, Mr. Peachy said, is that the process is not applicable. It is clear that there will have to be special mechanical appliances for building up, this being a matter for development in the future. With regard to the production of buffers, a point on which considerable discussion took place, the patentee was persistently optimistic as to the results which might be expected by building up in layers to be jointed by the new solution process, quite a moderate cold pressure being all that would be required.

Asked as to the formation of sulphuric acid through the process, Mr. Peachey said that he had not noticed it, but a weak ammonia treatment would be effective against it. As to the action of sulphur dioxide in certain fillers, he had not made any experiments, but in his ordinary procedure the hydrogen sulphide was always in excess, which meant that no free sulphur dioxide could occur in vulcanized goods.

With regard to the gases, the sulphur dioxide would be purchased by rubber manufacturers, though the hydrogen sulphide would probably have to be made on the premises and he agreed with one of the speakers that a permit would probably have to be obtained from a Government department. He thought that the toxicity of this gas had been exaggerated; indeed, he ventured to say that in small quantities it was an appetite improver and a dietetic. Plans for the necessary plant are now being prepared by important rubber engineers who have expressed themselves as confident of overcoming any initial difficulties.

Questioned on the point of the water produced in the chemical reaction between the two gases, Mr. Peachey said he had not found this to cause any trouble; it was produced in a very finely divided state and soon diffused out of the rubber, or could be removed by drying the rubber for an hour or so at, say, 35 degrees C. He had ideas of a mold made of some porous material for molded goods, but so far had nothing in that direction to report. With regard to compounded goods, Mr. Peachey said that pure rubber is more difficult to cure than compounded rubber, the gases penetrating more quickly in the latter case.

On the motion of J. Brierley, of the Leyland & Birmingham Rubber Co., Limited, seconded by H. W. Hatton, of the Premier Waterproof & Rubber Co., Limited, and supported by F. J. S. Gray, of St. Helens Cable & Rubber Co., Limited, a cordial vote of thanks was accorded by the guests to Mr. Minton for his hospitality.

THE WATERPROOF GARMENT TRADE.

Considering the extremely wet weather which has prevailed during the whole of July the continued stagnation in the weatherproof garment trade and the consequent accumulation of stocks has come as a surprise. People in the rubber proofed garment trade, however, say that wet weather does not usually bring an access of business, their experience being that potential purchasers say that the old coat is good enough for dirty weather and that they usually put off their new purchase until the fair weather that follows in the wake of the foul. By the way the weather is behaving this summer, it rather looks as if the purchase would be put off until the Greek Kalends, but we trust that there will be a turn for the better before long.

Although the making-up trade is by no means busy, the proofing works do not report any slackness, though foreign demand is quiet owing to what are considered excessive prices. The raincoat trade is in a poor way and makers are saddled with large stocks they do not know what to do with. This has come about chiefly on account of the cloth, a large amount of goods having been made entirely of cotton instead of the woolen or union gaberdine which used to be almost universally used and which were really some protection against rain, whereas the cotton article is of very little use. At the present time, however, the old-time gaberdine costs 25 shillings per yard and there is only a limited sale for coats made of it.

RUBBER MACHINERY STOCKS IN DEMAND.

New issues of capital have not been so frequent of late as they were some months back, but Francis Shaw & Co., Limited, has had a successful issue and the same may be said of Vickers, Limited, which, at one time an armament firm alone, is now closely concerned with the rubber industry.

Among recent developments in this line is the manufacture of rubber machinery at the Barrow works and the production of waterproof cloth at the Dartford works, Kent. These works were at first the home of the Clark tire of Australia and have been utilized more recently by Messrs. Vickers for war work.

EXCESS PROFITS DUTY.

A good deal has been said about the Excess Profits Duty now confirmed at 60 per cent for the current year being responsible for the slackness in trade which is apparent in many quarters, but it is much open to doubt as to the degree of influence which this tax has exerted. An interesting point of detail about deduction allowed in computing the profits of private limited companies is the distinction made between the original partner directors who are the real capitalists and other directors, generally heads of departments, who hold a few shares and who have been given the status of directors for certain reasons. The Chancellor of the Exchequer distinguishes the latter by the term employe-directors, which to my mind is a good idea and a useful distinc-

tion, albeit it may not be entirely to the liking of those concerned. Concessions which have been made to small new business will be appreciated by many in the rubber trade, and as for the large old-established concerns we shall probably find that despite their lamentations they will continue to present satisfactory balance sheets.

RUBBER EXPERTS IN STORES DEPARTMENTS.

I have been struck with an advertisement by the London County Council for an assistant in the stores department who understands the chemistry and manufacture of rubber. Candidates are to come direct from the rubber trade and their principal work will be concerned with the purchase and supply of rubber goods. I imagine this to be quite a new departure, the usual procedure being that all sorts of stores are bought by one individual of no technical knowledge who may or may not seek the assistance of a chemist who acts in an entirely subordinate capacity. It has long been in my mind that stores superintendents would be well advised to seek technical advice when arranging contracts for various articles, though I had not imagined the appointment of a whole-time expert for one particular branch of goods.

THE HOT WATER BOTTLE JUDGMENT AGAIN.

In an important assize trial in which many thousands of pounds were involved and which was concerned with the Sale of Goods Act, the writer was interested to hear counsel quote extracts from the hot-water-bottle judgment. In this case, which went to the High Court a few years ago, it was held that the seller of a hot-water bottle gave an implied warranty that the hot water would remain in the bottle and not go into the bed. The case had nothing to do with the rubber, but it appears that the judgment in the water-bottle case is quoted as an important one in its general bearings.

PNEUMATIC TIRES OF CHAR-A-BANCS.

The impending increase in railway fares will drive more travelers on to the road, but there can be little doubt that the monster char-a-bancs in which the so-called poor man spends so much time careering about the country will raise their fares in sympathy. These huge conveyances, which take up the whole of most of our narrower roads and are a constant source of annoyance to owners of private cars, are at present limited in their speed to 12 or 14 miles per hour. It is confidently anticipated, however, that the solid tires at present used will be replaced before long by pneumatics with the result of an increased rate of speed.

MAGNESIA.

An article entitled "Light and Calcined Magnesia" in The India Rubber World for July, is not wholly clear. Magnesia, as used in the rubber trade, is carbonate, heavy and light, and calcined, heavy and light. The scientific explanations given are right enough if read as applying to light and heavy and not to light and calcined. In Britain the bulk of the carbonate of magnesia used is the light, which, although of the same chemical composition as the heavy, both being hydroxycarbonates, occupies a far larger volume per unit of weight. This, as the writer of the paragraph points out, has nothing to do with specific gravity, but is concerned with occluded air. Where the magnesia is made by the wet chemical process by precipitating a magnesium salt with sodium carbonate the use of hot concentrated solutions gives a precipitate of heavy magnesia, while cold dilute solutions give the light variety. This being much more bulky requires far more space for production and subsequent drying. In a general way it may be taken that a certain weight of light and heavy magnesia, either carbonate or calcined, will occupy five times as much space for the light as for the heavy. The great bulk of the commercial magnesia used in the British rubber trade is not made by the old precipitation process but by the treatment of dolomite (the double carbonate of lime and magnesia) with carbonic acid gas under pressure. The magnesia goes into solution as the bicarbonate and is obtained on evaporation in the very lightest form and made over quite free from sulphates.

UNITED RUBBER PRODUCTS CO.

The United Rubber Products Co., which I mentioned in my last correspondence as having acquired the works of G. W. Laughton & Co., Limited, of Croft street, Clayton, Manchester, to work a recent process for the utilization of waste rubber, has come in for some animadversions in "Truth" of July 21. Personally I know nothing of the recent process, so cannot form an opinion as to its value, but it seems to have been too readily assumed that the process is one for reclaiming rubber, which is, of course, as critics have pointed out, by no means a novelty. If it is merely a reclaiming process the literature of the company might be revised with advantage, but it does not indicate that a new reclaiming process is valueless, though most of those which have reached the Patent Office files seem to die of inanition shortly after.

THE RUBBER INDUSTRY IN BELGIUM.

Special Correspondence.

THE COLONIAL EXPOSITION AT ANTWERP.

It can be said that when M. Franck, the Belgian Minister of Colonies, asked the Comité des Fêtes d'Anvers, 1920, to include in its program a colonial exposition, he chose the right time. For, apart from the educational value of an exposition of the vast natural resources of the Congo, it has the higher purpose

Hall of the Antwerp Colonial Exposition.

of showing to the thousands of foreigners gathered together at Antwerp from the four corners of the earth, that the horrors of the war and four long years of enemy occupation have not weakened the national spirit of enterprise.

Some of the names connected with the promotion of this exposition will sound familiar to many American rubber men. There is M. Edouard Bungé, head of the Société Anonyme Bungé, Antwerp, and the indefatigable president of the executive committee of the exposition. Lieutenant-Colonel Leon Osterrieth, director-general of the present exhibition and director of many a successful exposition in the past, it will be remembered, was military attaché at Washington during the war. Of the secretaries on the committee, Emile Hendrickx will be recalled as having accompanied Colonel Osterrieth during his stay in America.

The arrangement and appearance of the 40 booths are a credit to all concerned. As might have been expected, rubber and rubber men were very much in evidence. Among the concerns of interest to Americans in the rubber trade, the following were represented: L'Association des Planteurs de Caoutchouc,

Osterrieth & Co., Société Anonyme Bungé, Willaert Frères, G. & C. Kreglinger, Compagnie du Kasai, Grisar & Co., "Belgica" Comptoir Colonial; the last-named company has been particularly active in the planting of *Hevea* in the Congo and has plantations which have entered the productive period.

Of the exhibits, one of the most interesting certainly was a case of samples of *Hevea* from the plantations in the Congo run by the State and by the two companies that have persevered in planting *Hevea,* namely, the Forminière and the Belgica. The samples are said to be of excellent quality and were quoted in Antwerp at as high as 14-15 francs per kilo. It is further stated that in spite of doubting spirits, *Hevea* in the Congo is succeeding. The root disease from which the young trees suffered at first has been stopped and the trees are big yielders of excellent rubber. Many of the 7- to 8-year-old trees are said to have circumferences of over a meter (39.37 inches).

The annual production of plantation rubber in the Congo is estimated to be around 500 tons. And by the way, the estimated output of wild rubber for 1920 is 2,500,000 kilos. In 1917 the yield was 2,659,000 kilos.

All strength to the little country that put up such a brave fight during the great war, and is with equal pluck making strenuous efforts to win its way back to prosperity .

COMPAGNIE BERGOUGNAN BELGE.

The Société Générale des Etablissements Bergougnan, whose headquarters are at Clermont-Ferrand, France, has just established a branch in Belgium known as the Compagnie Bergougnan Belge. Its object is the commerce and industry of rubber and other gums, rubbered fabrics, chemical and industrial products for the manufacture of rubber and other gums, and of all that is connected with that branch of the industry; further, it will manufacture and sell all articles of metal or other substances that are related to the cycle, automobile and general vehicle industry. The capital of 20,000,000 francs is represented by 40,000 shares of 500 francs each, and 20,000 founders' shares.

The first directors are: Raymond Bergougnan, Etienne Clementel, Jean Bergougnan, Albert Galicier, Adrien Josse, Baron Edouard Empain, François Empain, Georges Theunis and Albert Mary.

BELGIUM'S COMMERCIAL REVIVAL.

That Belgium is picking up rapidly is abundantly apparent, and really all the trumps are with her; the sympathy of the world; a rich colony to develop and a thrifty, hard-working population; no Near Eastern question to bother about; no road to India to guard; being such a small country and having suffered so much in the war, she is not expected to take up undesirable burdens and to interfere when she would rather not.

Consequently she is able to concentrate all her efforts on regaining her former prosperity, and statistics show that she is on the highway to success. It is held that of all the European countries, Belgium's condition is the soundest. During the first quarter of 1919, Belgium had an unfavorable trade balance of over 91 per cent; the first three months of this year showed that the adverse balance had been cut to 42.1 per cent.

Her shipping is also picking up; since the war 24 steamship companies have been established in Antwerp; of these 10 have a total capital of 211,500,000 francs. The other 14 each have a capital of less than one million francs.

RESTORING THE ELASTICITY OF RUBBER.

Rubber articles that have become hard recover elasticity if soaked in three per cent carbolic water or three per cent aniline solution. In carbolic water black goods become gray. If it is desired to preserve the black or red color of the goods, that can be done by using a one per cent solution of pentasulphide of potash. This smells unpleasant, but the restoration of elasticity is quite considerable.

THE RUBBER INDUSTRY IN AUSTRIA.

By a Special Correspondent.

Men closely connected with the conditions in the Austrian rubber industry are inclined to be more hopeful about the economic future of Austria. It seems that the Austrian rubber manufacturers have been able to collect a fairly efficient labor force and will endeavor to specialize in the manufacture of high-class rubber goods requiring special skill for their production. For this kind of work Austria seems to be well equipped and as high prices can be obtained today for practically all articles requiring a large percentage of labor there is hope that Austria may be remunerated for her efforts. Among the principal obstacles to the development of the Austrian rubber industry at the present moment are the frequent internal political crises which are interrupting the slow progress of reconstruction which is being carried out with great energy by the manufacturers.

NOTES FROM GERMANY.

A somewhat peculiar experience is that of the German rubber sole industry. During the war rubber and substitute soles were much in demand. This enthusiasm for rubber footwear has continued all through the first year after the war. Now there is suddenly a falling off in the demand. The manufacturers thought that the decline in orders was due only to the general depression of the market, but it appears now that the German public is not so interested in rubber soles and heels as formerly. Great efforts have been made to retain the business, but notwithstanding, fewer rubber soles are sold and the demand for leather soles increases. Two reasons are given for this occurrence. The first is the comparatively low price of leather following the recent readjustment of hide prices and the second the poor quality of most of the rubber soles manufactured at the present time by the German manufacturers. A contributing cause which is of minor importance is the disinclination of the rubber goods dealers to sell rubber soles in competition with other retailers, such as dry goods stores, etc. The sale of rubber goods is still specialized in Germany and there are quite a number of goods stores dealing in nothing else but rubber articles. These stores are looking askance upon the wholesale distribution of rubber heels and in some cases have refused to handle the goods of factories dealing with other retailers.

The manufacturers of sporting shoes with rubber soles report a heavy decline in orders, due principally to the high prices still ruling. The fact is that the German public has regained its usual understanding of the value of money and is not inclined to spend as recklessly as a few months ago. This naturally has an effect upon the distribution of high-priced goods, and where four months ago any price would have been paid, today the customer will leave the shop and think twice before purchasing.

The Central Union of Surgical Rubber Goods Dealers is firing a broadside at the Commissioner of Imports and Exports against the recent regulation which forces exporters to quote in foreign money units. It seems that the necessity of quoting in foreign money has led to a considerable reduction in foreign orders for German merchandise and that other difficulties have resulted from the regulation. It is, for instance, practically impossible for any German merchant to draw a perfect balance as he never knows how he stands with reference to his foreign credits. The Surgical Rubber Goods Dealers are of the opinion that it should be left to the exporter to say whether he wants to quote in German or foreign money.

The same association has also raised a protest against the recent law imposing a duty of ten per cent on all exports.

GERMAN CRUDE RUBBER MARKET.

A market for crude rubber has been established in Hamburg and rubber importers are again able to quote German prices, subject, however, to frequent changes. The following are the prices ruling the first week of July: crêpe, finest light, 33 marks per kilogram; first latex crêpe, thick, 33 marks; prime smoked

sheets, 33 marks; hard cured fine Pará, 37.50 marks; Peruvian, 32 marks; block balata, Venezuela, 66 marks; reclaimed rubber, American, gray, 23 marks; white, 22 marks; black, 16 marks.

Much interesting information about conditions in the German rubber industry is contained in the recent report of the Kölnische Gummifaeden Fabrik of Cologne. This firm is engaged principally in the manufacture of elastic bands. With the help of small quantities of rubber obtained from governmental stocks in the beginning of 1919, the works started again, being closed for several years. Later larger supplies of rubber were obtained from England and deliveries have been regular ever since so that the factory is now working at full capacity. While rubber is obtainable at fair prices, there are great difficulties in the deliveries of supplementary materials such as solvents, cotton fabrics and fuel, most of which still have to be imported. With the resumption of international trading relations the factory has been able to obtain good orders, although prices have fluctuated heavily under the influence of the changing foreign money values. An increase of the share capital of this company from 1,080,000 marks to 3,000,000 marks is proposed.

FINANCIAL AND TRADE NOTES.

The Asbest und Gummi Werke Alfred Calmon Aktiengesellschaft of Hamburg has increased its share capital from 4,000,000 marks to 10,000,000 marks.

The Deutsche Linoleum Werke, Hansa, in Delmenhorst, has increased its share capital from 3,400,000 marks to 4,800,000 marks.

Owing to the difficulty of obtaining regular supplies of coal several large industrial enterprises in Germany have recently acquired their own coal mines. Among others, the Continental Caoutchouc & Gutta Percha Co., Hanover, has asked the shareholders for authorization to buy a coal mine in Westphalia.

The Norddeutsche Gummi und Guttapercha Waren-Fabrik, formerly Fonrobert & Reimann Aktiengesellschaft, in Berlin, in creased its capital from 1,500,000 marks to 3,000,000 marks.

C. Mueller Gummiwaren Fabrik, Aktiengesellscharft, Berlin-Weissensee, has increased its capital from 1,100,000 marks to 2,200,000 marks.

The Bremer Gummiwerke Roland A. G., located at Bremen, has changed its name to Bremer Gummiwerke Roland Aktiengesellschaft. The company has decided to increase its capital from 1,200,000 marks to 2,000,000 marks.

Erich Bonwitt, 68 Chaussee street, Berlin-Britz, is a wholesale distributer of rubber, old rubber, and other similar articles.

NEWS OF THE GERMAN CABLE INDUSTRY.

The German cable industry, which is one of the most active branches of the German electrical industry, passed through a rather difficult time during the war. As an export industry of considerable importance it severely felt being cut off from foreign markets, and for a while at least, the directors of the cable manufacturing companies were inclined to take a rather serious view of the situation. An improvement took place during the beginning of 1915 when army orders began to pour in, with the result that the industry was soon occupied upon government work almost entirely, a condition that has continued up to the end of the war.

The German cable industry relies for its rubber material entirely upon foreign supplies, and it made only very small use of reclaimed rubber manufactured in German factories before the war. In fact, most of the reclaimed rubber used by the larger German works was of either English or American origin. New rubber was soon practically unobtainable owing to the British blockade, and the electrical industry therefore was compelled to fall back upon substitutes of various characters. Old material was used wherever possible, and a great many other materials were tried with little appreciation, however, from the engineers. So the acquisition of rubber is one of the principal problems of the German cable industry at the present time. The question has been thoroughly ventilated in German technical journals and associations, and it is generally expected that Germany will not have difficulty in securing the necessary rubber at competitive prices, provided always that the allies do not make true their threat of the Paris Conference, to cut off Germany from the raw material supplies or to supply raw materials to Germany at higher cost than those sold to their own industries. To-day rubber is purchased in small quantities by the German cable industries in London and by way of the Netherlands. Also limited quantities of reclaimed rubber have reached the cable works by way of the famous "hole in the West," the territory now under occupation by the allies which forms a large opening for the introduction of many articles of allied origin.

The high prices that have to be paid for rubber and reclaimed rubber introduced in this manner, have raised the prices of cables very much and there is in fact at the present moment no standard price in Germany for any article, manufactured from imported raw materials. Wages in the cable industry have risen very rapidly since the armistice was concluded and are now, on the basis of international exchange value, approximately three times what they were before the war, and with no prospect for firm rates until a stabilization of the exchange rate of the mark has been effected. The eight-hour day, of course, is an accomplished fact in all cable works, and this, in addition to the very much decreased efficiency of the labor force, has acted to reduce materially the production. There are no special statistics available for the conditions in the cable industry. It has been shown, however, that the average reduction of efficiency of the labor force comprises about five-eighths of the former working performance per employe.

To help maintain prices on a profitable level and to assist individual manufacturers in the purchase of raw materials, especially rubber, it has become necessary to continue the Verband Deutscher Stark Strom Kabel Fabrikanten, which now includes all the cable works of importance, as the formation of associations of this character has been supported by the Government during the war.

The German cable industry is expected to be very busy during the next year. Germany is now executing a very far-reaching program of national electrical power development which is principally based upon power production at specially suitable centres, and the transmission of the power generated in this manner to the points of consumption by way of high tension cables. As some of these giant generating stations will be situated in the Rhineland and power will have to be transmitted as far as Berlin, large cables will be required for that purpose. The German plan of power generation contemplates also the erection of power stations on several hydro-electric sites with the provision that these stations, of which some are already in operation, will be linked up with the large coal-fed generating stations, each supporting the other. This will require also very powerful cables for the exchange of power between the different stations.

This work alone will provide occupation for the cable works of Germany during the next few years. But additional work is provided further by the necessity of renewing the under-sea cables that have either been destroyed by the Allies or taken over as the result of the peace agreement. The renewal of the German international cable lines is at present one of Germany's most difficult modern problems. Everybody in Germany seems to agree that the nation should own its own cable lines in the future. But so far nobody is able to say who shall pay for the new installation and how it will be possible to secure the necessary terminals, as these have been taken over, together with the cables, by the Allies. The cable works, however, are confident that a solution of the problem will be found and that new cables necessary to Germany's renaissance will have to be made by the works.

DEATH OF THREE PROMINENT GERMAN RUBBER MEN.

The "*Gummi-Zeitung*" announces the death of three men prominent in the German rubber industry. Ch. C. Bohning, director of the Bremer Gummiwerke Roland A. G., died in Bremen, Germany, on July 4, 1920. Before entering the above firm Mr. Bohning was director of the Grottau Section of the Vereinigte Berlin Frankfurt Gummiwaren fabriken.

Dr. Hugo Cassirer died in Charlottenburg, near Berlin, on the eighth of July, at the age of fifty-one years. He was the founder of Dr. Cassirer and Co., and of the Lincas Gummiwaren fabrik, G. m. b. H.

Karl Reithoffer, a member of the well-known firm of the Gummi-und Kabelwerke Josef Reithoffer's Soehne, Vienna Stepr-Trencsen, died in Vienna, on June 22, 1920, following an operation for appendicitis. He was born in 1870. The firm of Josef Reithoffer's Soehne is said to be the oldest rubber works in the world, having been founded in 1811 by J. N. Reithoffer, for the manufacture of rubber thread to be used in elastic woven goods.

TARIFF NOTES.

AUSTRALIA.

Among recent additions to the list of articles that may be admitted into Australia free of import duty under special license for use in the manufacturing of other commodities are machines for applying rubber internal wire tires to wheels, and machines for close-jointing rubber internal wire tires after application to wheels.

INCREASE OF CUSTOMS DUTIES IN BELGIUM.

By a Belgian law dated June 10, 1920, the government was authorized to apply to the specific rates of duty laid down in the Customs Tariff "coefficients of increase," which were not to exceed three in any case. This law was followed by a royal decree dated June 12. The decree became effective on June 21 and will continue in force until June 15, 1921. The coefficient of increase does not apply to *ad valorem* duties. The coefficient of increase is the figure by which the normal tariff must be multiplied to obtain the new rate of duty.

Equivalents.—Franc, about 19 cents (normal); kilo, 2.2 pounds.

Tariff No.			Duty in Francs.	Coefficient of Increase.
10	India rubber:			
	Raw		Free	..
	Rubber tires:			
	Solid tires	100 kilos	65.00	2
	Pneumatic tires:			
	Casings for automobiles and motorcycles:			
	With studded leather band	100 *kilos*	130.00	2
	Other	100 *kilos*	116.00	2
	Casings for other vehicles weighing each—			
	Less than 600 grammes	100 *kilos*	90.00	2
	600 grammes or over	100 *kilos*	60.00	2
	(Treads, protectors, etc., composed mainly of rubber, are to be treated as complete corners.)			
	Inner tubes:			
	For automobiles and motorcycles	100 *kilos*	170.00	2
	For other vehicles	100 *kilos*	150.00	2
	Other manufactures of rubber	*ad val*	10%	..
33.	Rubber belting	100 *kilos*	30.00	2
54.	Manufactures of asbestos combined or not with rubber (packing), tubes and pipes of rubber, rubber tubes for artificial flowers	*ad val*	5%	..
64.	Elastic tissues mixed with cotton silk, etc., cotton predominating	100 *kilos*	320.00	3

Note—Rubbered textile fabrics specially manufactured for making cord fillets are free of duty. However, imports of these fabrics can only take place through the custom houses designated for the purpose, and subject to the importers proving to the satisfaction of the customs that the fabrics are really intended for the above mentioned purpose.

DENMARK.

By a decree of the Royal Danish Government of June 29, 1920, the restrictions on the exportation of rubber tires and rubber tubes for motor vehicles have been removed.

GERMANY.

According to the *"Deutsche Allgemeine Zeitung,"* Germany, with the object of regulating its foreign trade, has had recourse to the ad valorem system of duties on exports. The duty on all kinds of rubber and rubber goods is two per cent of the value, which varies according to their quality and importance to Germany.

MEXICO.

The Mexican "Diario Oficial," issue of June 30, 1920, contains the changes in the Mexican schedule of import duties which went into effect July 1, 1920. Of special importance are the reductions in duty on rubberized cloth and waterproof clothing, shown in the following comparative table (the normal value of the Mexican peso is $0.4985; a kiio is 2.2046 pounds):

Item No.	Article.	New Duty, Pesos per Kilo.	Old Duty, Pesos per Kilo.
703A.	Ready made clothing of rubberized cloth..*legal weight*	.60	4.00
712	Rubberized cloth of cotton, same duty as cotton cloth of same grade	...	(*)
712A.	Rubberized cloth of linen, hemp, and similar fibers, wool, or silk, dutiable at 50 per cent of the rate on corresponding cloth	...	(*)

*Former classification uncertain

The original decree provided for the doubling of the duty on rubber tires for automobiles and trucks. This change, however, was abrogated by the decree of July 12 and the former rates are now in effect.

CONDITIONS IN FRENCH INDO-CHINA.

Special Correspondence.

The economic condition of Indo-China has never been so good as it is at present. The country has progressed, industries are growing, the country's products, among which are rice, pepper, minerals and rubber, are in great demand and the rate of exchange of the piaster, the local coin unit, is high. Altogether there is extraordinary prosperity in this French colony.

In the face of all this it comes as a shock to read in the April number of the *"Bulletin du Syndicat des Planteurs de Caoutchouc de l'Indochine,"* telegrams in which the necessity of a much-reduced rate of exchange is urged if the plantation industries in this country are not to be ruined.

The piaster, a silver coin, had before the war a value of approximately 2.50 francs. At the present time, however, the rate has reached the abnormal figure of 14.50 francs, giving the piaster, which normally is equal to about half an American dollar, a value greater than that of the dollar. The plantation industries, except rice, are suffering severely, for the high value of the piaster makes their products, rubber particularly, two and three times as expensive to produce as the like products from Malaya or the Netherlands East Indies.

As a remedy, the Chamber of Agriculture, Chamber of Commerce and the local Rubber Planters' Association have addressed a letter to the new Governor General, M. Maurice Long, suggesting means of improving the situation. It seems that there is a great shortage of rice throughout the East. Indo-China has a bumper rice crop and can export to the value of 225,000,000 piasters. It is now suggested to levy an export tax of three per cent of the rice, the funds thus obtained to be used to aid agriculturists, rubber planters, etc.

THE RUBBER MARKET AT MARSEILLES.

Letters between a Parisian rubber broker and the President of the Colonial Institute at Marseilles have been published in a recent issue of the *"Bulletin des Planteurs de Caoutchouc de l'Indochine,"* and reveal certain conditions existing in the Marseilles rubber market that are not only detrimental to rubber planters in Indo-China, but will prove a disadvantage to Marseilles as a port of entry for rubber.

The Parisian broker declares that when making tare allowances the local importers from Indo-China give the weight authorized by the sworn weighers. The weighers, however, do not weigh each case in a lot, but give an average weight based on the actual weight of, say 10 per cent of the cases. As this

average is generally too low, this method of procedure spells loss to the purchaser. Another point is this:—rubber from this colony is of an irregular quality and is appraised below corresponding grades of Malayan or Ceylon rubber. Now, it happens that many importers of the Indo-Chinese rubber, considering their mark sufficiently well-known, refuse to take samples from lots offered for sale and offer only samples taken from former lots. This, in combination with the pretty bad reputation of Indo-China rubber, forces an importer, who begins by demanding a price based on the rate for Malayan rubber quoted in London, to sell his goods at a price very much below the London rate and often below the actual value of his rubber.

IMPORTS AND EXPORTS.

According to a recent issue of the *"Bulletin Economique de l'Indochine,"* France sent to this colony during the year 1918, rubber goods—chiefly tires—to the value of 1,305,000 francs and weighing 687 quintals (220.46 pounds) against a value of 1,233,000 francs and a weight of 649 quintals during 1917, the figures for 1918 showing an increase in value of 72,000 francs.

From other countries the imports were as follows:—boots and shoes of rubber: 391 quintals, value 313,100 francs in 1918 and 139 quintals, value 111,100 francs in 1917; elastic fabrics: 55 quintals, value 136,800 francs in 1918 against 31 quintals, value 72,200 francs in the previous year. Belting, hose and packing also showed an increase for 1918, the figures being 421 quintals, value 378,800 francs, as compared with 205 quintals, value 184,700 francs during 1917. The most important increase was tires and tubes, the 1918 imports being 403 quintals, value 766,000 francs against only 75 quintals, value 142,500 francs in 1917. Here the difference in favor of 1918 is 623,500 francs. That Japan's share in all this business is considered important, although the amounts are 186 quintals, value 226,000 francs, is seen from the fact that the imports from that country are the only ones to be specially mentioned. The exports of crude rubber follows:

	France. Kilos.	Other Countries. Kilos.	Totals. Kilos.	Total Values. Francs.
1913	168,700	45,200	213,900	....
1914	146,000	48,000	194,600	876,000
1915	376,100	600	376,700	1,695,000
1916	547,800	700	548,500	3,292,000
1917	930,800	....	930,800	5,585,000
1918	537,700	....	537,700	3,226,000

The drop in exports during 1918 was more than made up for during 1919, when total exports of rubber amounted to 3,518,969 kilos. Of this 2,834,853 kilos of plantation rubber went to France; 7,084, kilos to London; 32,816 kilos to Hongkong; 939 kilos to San Francisco; 354,106 kilos to Shanghai; 259,822 kilos to Singapore. Besides this 29,349 kilos of wild rubber were shipped to Marseilles.

THE RUBBER TRADE OF INDIA.

BURMA.

RUBBER is fast becoming one of Burma's principal exports; 4,149,000 pounds being shipped in the fiscal year 1918-19 as against 2,634,000 pounds in 1917-18, and 2,301,000 pounds in 1916-17. Most of these shipments went to the United Kingdom. Rubber goods to the value of \$6,505; \$18,538; and \$11,292 were imported from the United States to Burma during the fiscal years 1917, 1918 and 1919 respectively. The decrease in 1919 was due chiefly to import and export restrictions. Declared exports of india rubber from Rangoon to the United States in 1918 totalled 4,480 pounds valued \$2,777; in 1919, 112,215 pounds valued \$57,142.

There are 500 mills or factories in Burma, which offer a possible market for rubber belting. Though the British are said to control the greater part of this business, competition from American manufacturers is beginning to be felt. The imports of rubber, balata, and fabric belting were, in 1918-1919, £76,600 compared with £38,000 in 1914-1915.

In the hope of restoring the rubber industry in Burma, the Government has decided to advance 100 rupees at 6½ per cent interest for every acre planted with rubber. During the first six months of 1919, Burma's largest ten plantations produced 1,142,383 pounds of rubber. Exports in the same period amounted to 2,206,527 pounds, valued at \$836,052.

CALCUTTA.

Rubber articles to the value of \$1,565,216 were imported at the port of Calcutta during 1917-18. The following year, 1918-19, shows a slight increase in value, the amount totaling \$1,586,529. Raw rubber exported from Calcutta in 1917-18 amounted to \$2,024, while in 1918-19 the amount decreased to \$1,864.

SOUTH AMERICAN NOTES.

PERU.

MANUFACTURERS of rubber to the value of \$241,398 were imported into Peru in 1918 as against \$162,923 in 1917. Exports of crude rubber from Peru in 1917 were: Condurango, \$91,836; crude, \$2,812,640; during 1918, Condurango \$47,497; crude \$1,573,646. Declared exports of rubber to the United States from Callao during 1917 were 3,760 pounds of Condurango, valued \$375 and 8,568 pounds of raw rubber valued \$4,435. From Mollendo 705,684 pounds of rubber valued \$393,536 were exported to the United States in 1917, while in 1918 the amount decreased to 25,112 pounds valued \$12,066.

NICARAGUA.

Exports of crude rubber from Nicaragua amounted to \$258,852 in 1917 as against \$42,619 in 1918. This decrease was due to the restrictions placed upon this product and the decline of the market. Declared exports of rubber from Corinto to the United States in 1917 were 224,429 pounds valued \$107,158; in 1918, 77,000 pounds valued \$25,479.

PIRELLI BUYS JAVAN ESTATE

It is reported that on June 10, 1920, the Rubber & Tea Estate Boesi Sari Lendra, covering about 2,100 acres, and planted for the greater part, was sold for about \$540,000 to Pirelli & Co., Milan, Italy, manufacturers of tires, rubber goods, insulated wire, etc. The estate is situated about 30 miles from Garoet, Java.

The Italian company acted through Dr. Luigi Sarcoli, a doctor of chemistry, who will establish himself in Java and act as estate manager. He, together with Alfredo Calcagni, also connected with the Pirelli factory, arrived in Java with a staff of 30 employes.

The estate will now be operated exclusively for supplying raw material to the plant in Milan.

Buying up more estates was at first considered, but owing to difficulties with foreign exchange, nothing appears to have come of this yet.

ALGERIA RUBBER IMPORTS.

Rubber goods were imported into Algeria in larger quantity in 1919 than in 1918, the totals being 421 metric tons valued at \$1,846,624 in 1918 as against 610 metric tons valued at \$2,731,143 in 1919. The quantity of imports of rubber and gutta percha goods from the United States in kilos (1 kilo equals 2.2046 pounds) for the year 1919 is given provisionally in the table below:

Fountain pens . . . . Kilos	318
Shoes	37
Tires	16,400
Other rubber manufactures	300

The Rubber Trade in Japan.

By Our Regular Correspondent.

THE JAPANESE RUBBER INDUSTRY.

It was about thirty-four years ago that the Japanese rubber industry started. N. Tasaki, owner of the Tsuchiya Rubber Works, which later became the Mitatsuchi Rubber Manufacturing Co., was the first man in Japan to learn the process of rubber vulcanization. Since then Japanese rubber manufacturing has made considerable progress. Some manufacturers learned their methods from foreign engineers, some from books on rubber manufacturing, and thus more than thirty years have passed. At present there are 130 factories in Tokio.

A general survey of the rubber factories in Japan indicates that all divide themselves into five heads:

1. The Mitatsuchi Rubber Manufacturing Co. line.
2. The Meiji Rubber Factory line.
3. The Rubber Co. line.
4. The Dunlop and the Ingram line.
5. Other lines.

The Tsuchiya Rubber Works, afterward the Mitatsuchi Rubber Manufacturing Co., was established thirty-four years ago at Kamiyoshi-cho, Asakusa, Tokio. Messrs. T. Tasaki and H. Tsuchiya were the owners of this factory. They were of the Matsumae clan, Hokkaido, and fishing and refloating wrecked ships, by using diving apparatus and rubber hose, was their occupation. Their equipment required frequent repairs, especially the rubber parts. In order to mend these they purchased at Yokohama scrap rubber discarded by the Navy Office, dissolved it in volatile oil and made a jelly-like material with which the damaged parts were plastered.

As their fishery did not prosper, they established a factory at Kamiyoshicho, Asakusa, Tokio, for manufacturing diving dresses. This factory was the first one in Japan. In those days these diving dresses were sold only to the railway and steamship companies, so that the demand was soon exhausted. Then they undertook to become repairers of these dresses, also manufacturing stamp-stands for the Department of Communication.

It was about 1882 or 1883 that rubber became known a little among the Japanese people, but owing to the deficiency of manufacturing knowledge and experience, the rubber industry in Japan was still in its infancy. As no other rubber factory had been established in Japan in those days, the Tsuchiya Rubber Co. held a monopoly. Owing to the limited demand for their goods, however, it suffered from financial difficulties, yet bravely continued the business until a method of vulcanization was learned on December 2, 1886; this day it was decided to incorporate. In 1889 bulbs and packings were added to the list of goods and in the following year some rubber manufactures were exhibited at the Domestic Industrial Exhibition. The factory was removed to Narihira-cho Honjo, in the same city in 1892, and in 1893 the company became a partnership and the name was changed to the Mitatsuchi Rubber Manufacturing Co. Besides former productions, manufacture of ebonite and suction hose was now begun. During the Chino-Japanese war, they profitably met the requirements of the War and Navy Offices. Since then the rubber manufacturing industry in Japan has made constant progress. In 1897, rubber balls were manufactured, and in three years enough were produced so that the imports of foreign-made balls became unnecessary. In those days, rubber balls were mainly imported from Germany, the total amount being $120,000 a year. At present, a great number of them are exported.

The company now known as the Fujikura Insulated Wire & Cable Co., Tokio, was a pioneer in the production of rubber-covered wire. The progressive policy of Mr. Fujikura, who founded the industry in 1885, has been continued since his death, in 1902, by T. Matsumoto, the present president of the company. The concern adheres closely to the standards of the British Cable Makers' Association and the Japanese Government to insure the maximum of efficiency in the products.

Much of the success of the company is also due to Kenzo Okada, nephew of the late Mr. Fujikura, who became a partner in the factory in 1901. He will be remembered by not a few rubber men in the United States where he worked for several years acquiring a knowledge of the industry.

In 1887, K. Yoshida, getting a water bottle of rubber from abroad, endeavored to manufacture this line of rubber goods, and at last, with the assistance of F. Komae and his brother, R. Yoshida, who were then students of the Doshisha University in Kyoto and had many chances of reading foreign books on rubber, worked out a manufacturing method. By 1889, there were but few factories in Japan. K. Suzuki, who learned the method of making rubber solution in naphtha, began to manufacture stamp-stands, with the capital furnished by S. Nomoto; but unfortunately his undertaking did not go well. Mr. Mori also in these days inaugurated a shop with a view of making rubber seals.

The Tokio Rubber Manufacturing Co., a limited partnership, was established in 1892. G. Matsumoto and S. Morita were the capitalists. They engaged Mr. Saito as an expert and were doing a brisk business when the engineer died and the factory had to suspend. In 1896 this company was purchased by K. Kamijo and the firm name was changed to the Tokio Rubber Factory, K. Kamada being engaged as engineer.

In 1901 G. Yonei, who died last year, bought this factory and changed the name of the company to the Meiji Rubber Factory. This is one of the oldest and largest rubber factories in Japan.

The Tokio Rubber Co. was established in 1899, H. Tanaka induced S. Nomoto, Z. Fujikura and E. Shibusawa to assist the company, and engaged Mr. Ogihara, an engineer educated in America, with the object of manufacturing rubber goods. Unfortunately the goods were not successful and therefore they bought over Mr. Arihara, of the Mitatsuchi Rubber Manufacturing Co., to manufacture "Tabi" soles; but this second attempt also did not bear good fruit.

A few years later Messrs. Y. Yashida and Hanaki, who were then employed by the Meiji Rubber Factory, purchased the Tokyo Rubber Co. and reduced its capital from $150,000 to $75,000.

The Nippon Rubber Co. was established in 1900 by the combination of two companies, with W. Yamasaki as director. One was the Yashida Rubber Factory, which had been established at Hisakata-cho, Tokio, by the cooperation of Messrs. S. Yoshida and W. Yamasaki in 1896; the other, the Nippon Rubber Co., established at Hashibacho, Asakusa, in 1900, R. Motohashi being the director.

In 1900, the Meiji Rubber Factory engaged Mr. Ferguson, an Englishman. In those days there was no factory which kept a foreign expert.

This new attempt gave a little animation to the Japanese rubber manufacturing industry, but a large development was still far in the distance. The following figures show the amount of the business in those days:

CRUDE RUBBER IMPORTS.

Year.	Pounds.	Value.
1900	107,439	$52,179
1911	154,924	68,332

A little after the Russo-Japanese War, the Dunlop Rubber Co., Far East, Limited, was organized in 1907. At first it imported rubber goods from the Dunlop company in England and the

Ingram Co. in America; but a few years later, a factory was established at Kobe for the manufacture of bicycle tires.

The Japan Ingram Co. was established by the son of Arthur Ingram, with the object of making rubber goods.

NEW RUBBER CORPORATIONS IN JAPAN.

The following corporations were established in Japan during 1919:

Kyodo Rubber Co., Limited. Capital, $500,000, one-fourth paid in. Office, at Sugamo, Tokyo.

Miyakawa & Co. This shop was formerly operated by Mr. Miyakawa, but was incorporated owing to the increase of business.

Hinomaru Wire Rubber Co., Limited. Capital, $500,000. Office in Osaka.

Americo-Japanese Rubber Industry Co., Limited. Capital, $500,000, one-fourth paid in. Office, Yurakucho, Tokyo.

Towa Rubber Co., Limited. Capital, $100,000, one-fourth paid in.

Godo Rubber Industry Co., Limited. Capital, $100,000, one-fourth paid in. This company is to manufacture cycle tires, tubes and other rubber goods. Office at Minamisenju, Tokyo.

Hinode Rubber Co. Capital, $15,000. Office at Shitaya, Tokyo.

Nikkwa Rubber Industry Co. Capital, $5,000.

Rubber Balloon Manufacturing Factory. Capital, $250,000. Office at Osaki, Tokyo.

Tokio Rubber Co., Limited. Capital, $1,250,000. Office at Ochiai, Tokyo.

Yamato Rubber Industry Co., Limited. Capital, $250,000, one-fourth paid in. Office at Kameido, Tokyo.

Koyama Rubber Commerce and Industry Co., Limited. Capital, $50,000, all paid in. Office at Kanda, Tokyo.

Osaka Tabi Sole Co., Limited. Capital, $250,000. Office in Osaka.

Daiichi Rubber Factory. Office at Kameido, Tokyo.

Nippon Ebonite Co. Office at Mikawashima, Tokyo.

Hokoku Rubber Co., Limited. Capital, $500,000, one-fourth paid in. Office in Osaka.

Osaka Rubber Sole Tabi Manufacturing Co. Capital, $12,000. Office in Osaka.

Izumo Rubber Works. Capital, $15,000. Office at Kitashinagawa, Tokyo.

Nichifuku Rubber Manufacturing Factory. Office in Tokyo.

Yukita Rubber Industry Co., Limited. Capital, $75,000, one-fourth paid in. Office in Saitama Prefecture.

Imperial Cycle Co., Limited. Office in Tokyo.

Fukushima System Rubber Shoe Co., Limited. Capital, $100,000, one-fourth paid in. Office at Nihonbashi, Tokyo.

Central Rubber Industry Co., Limited. Capital, $1,000,000, one-fourth paid in. Office in Tokyo.

JAPANESE NOTES.

From all accounts it seems that Japan is endeavoring to dominate trade in the East. That she is succeeding to a certain extent is acknowledged, and among the growing exports may be noted rubber goods. Japan is also trying to maintain her position in shipping, but the English have recovered their prestige quicker than Japan thought possible, and America is a competitor to be reckoned with. In spite of this, the large steamship companies entertain extensive plans for the future, including improvements in the harbor of Tokio.

JAPAN AND THE NETHERLAND EAST INDIES.

Japan is particularly friendly with the Netherland East Indies. The "Dutch East Indian Archipelago" announces that "the Japanese squadron has been cordially received at Macassar and other ports in the Archipelago. Officers and crews were regaled everywhere." It is not a one-sided affair, for "reports about the hearty welcome extended to the Dutch squadron in Japan have been received here with great satisfaction." Also, the "South Sea Association" at Tokio has decided to hold an exhibition of produce and manufactures of the Netherland East Indies. The Dutch authorities at various points in Japan are cooperating heartily. Among the principal exhibits, rubber, of course, takes an important place. A final quotation from the above publication follows here: "The Japanese Government has again invited some prominent Dutch gentlemen to visit Japan. The visit will probably take place in 1921."

JAPAN'S IMPORTS.

Japan's imports of crude rubber in 1919 exceeded 24,000,000 pounds, an increase of 48 per cent over 1918. Domestic manufactures include automobile and bicycle tires, rubber cloths, and mechanical and industrial rubber goods. Imports of rubber manufactures were chiefly waste or old rubber, woven belts, hose, plates, sheets, tubes, waterproof sheeting, insulating tape, insulated wire, threads, strips, bands, rings, washers, rods, and cords. The imports of dental rubber alone amounted to $85,000. Japan's rubber manufacturers have received large orders from Siberia.

THE RUBBER INDUSTRY IN CEYLON.

Special Correspondence.

Much space in local publications is being devoted to the question of a Ceylon planters' union. Opinion is fairly unanimous as regards the need for some change in the conditions of the planters, but there is quite a lot of more or less intemperate argument about the need of a union. The more conservative minds think that the existing Ceylon Planters' Association is fully capable of meeting the needs of all the planters, particularly if it were reorganized. However, a great number of planters, probably influenced by the success of planters' unions in Java and Sumatra and of the Incorporated Society of Federated Malay States Planters, desire a separate association.

From the mass of correspondence on the subject it appears that among the sympathizers with the idea of a union there is a very strong objection to the name union. Opposers of the entire scheme are afraid of Bolshevism. A few believe that the present salaries would be adequate if rates of exchange were normal and will be sufficient once normal progress reduces the cost of living all around, and therefore suggest a temporary bonus to help the planters over the abnormal period. That this last suggestion is entirely impossible from the planters' point of view, is evident from their demands, which include increases of pay; home leave with full pay plus passage money at the end of a fixed period of service; sick leave, and pensions.

Prior to the present union scheme, an estate superintendents' association had been organized and was widely supported. Fortunately for the success of the newer scheme, the superintendents' association has now been amalgamated with it.

COUNCIL REFORM.

At the Ceylon Association dinner given recently in London to the Governor of Ceylon, who is on a visit to England, the Governor declared that he would urge that the mercantile community should again have representation in the legislative council and also in his own privy council. The Ceylonese should have a greater voice in the government of Ceylon.

EXPORT DUTY ON RUBBER.

At a recent meeting of the legislative council of Ceylon the question was asked whether the Government when preparing the budget for 1920-21, would consider the possibility of reducing, if not withdrawing entirely, the export duties on tea and rubber imposed during the war to provide funds for carry-

ing on the works usually debited to loan account. No relief was promised.

CEYLON DURING 1919.

During 1919 conditions were more favorable for rubber, though the high rate of freight and the abnormal exchange rate were serious factors in the cost of production. The price for the first grades of plantation rubber fluctuated considerably, falling from *2s. 2d.* in January, to *1s. 7d.* in June to rise again to *2s. 11d.* at the end of the year.

Reports from Ceylon show no serious increase of pests or diseases during the year 1919, though brown bast had been giving trouble on some of the older estates.

The budget for 1920-21 disclosing that not only is the excess profit tax to be retained but is to be increased to 60 per cent, has caused considerable disappointment here.

GENERAL NOTES.

The present freight rate of rubber from Ceylon to the United Kingdom is 165 shillings.

The General Rubber Co. will shortly be moving into new premises above the Eastern Bank, Limited, in Chatham street, Ceylon.

It is reported that a Badulla planter has left Ceylon for North Borneo to open 200 square miles of rubber, 5,000 acres at a time.

It appears that the Holland-America Steamship Co. proposes to begin a service of freight boats from Europe to the East with an extension to America. Colombo will be a port of call.

The new Dixon line is to run regularly from Colombo. It is understood that Messrs. Struthers and Dixon will establish a branch executive office at Singapore, better to handle the ports in the neighborhood.

The Ellerman & Bucknall Steamship Co., Limited, is starting a regular monthly service from Montreal to Port Said, the Soudan, Aden, Bombay, Colombo, Singapore and Java.

THE RUBBER INDUSTRY IN MALAYA.

Special Correspondence.

THE OUTLOOK for rubber is fully occupying everybody's attention. The general opinion seems to be that conditions are favorable enough and that all would be well were it not for the labor problem. Others look at the large new planted areas and talk of overproduction and a slump in the market, while many take comfort in the huge amounts of rubber used in America, in the increasing use of motor-driven vehicles and the consequent demand for tires of every kind, and have no fear of the future. Those who talk of overproduction are told that diseases are carrying off great numbers of trees and that all that is planted is not destined to produce. Not a very consoling answer, whatever the implication may have been.

THE AMERICAN BUGABOO REVIVED.

Some years ago there was a great outcry here from a certain section of the planting community against the American invasion of rubber lands. That bugaboo was eventually buried when the Rubber Lands Enactment was enforced. However, it has appeared again in new form and stalks about in the guise of American financiers who are gambling with rubber. At all events, a letter in the "Malayan Tire & Rubber Journal," May 31, 1920, signed by "Help Yourself," expresses astonishment at the rubber growers of Malaya, Ceylon, Java and Sumatra who are allowing American buyers to control the price of rubber. He, too, believes in a rubber shortage; also is apparently anxious that the price of rubber should be correspondingly high, and suggests a combination of rubber growers of the Mid-East to control the output and the price of rubber.

RUBBER PRICES.

The "Straits Times," May 27, says in an editorial: "From a source which on many occasions we have found most reliable, we learn that there is a quiet movement on foot to take advantage of the present low prices of rubber and to buy up control of the local companies. The big manufacturing interests are said to be at the back of the movement, and the reason given is that, in their opinion, rubber is of much greater value than the current prices would lead one to assume." As will be noted, the "Straits Times" mentions no names and talks of no manufacturing interests in general—English, American, any kind. It also counsels shareholders to hold on to their shares.

It further says: "Malaya produces nearly three-fifths of the world's total output, so that it is within the power of the Malayan companies to force prices up at any time they please." It also advises the industry to perfect its organization and to get experts to study the price question.

ALTERNATE-DAILY TAPPING.

In the life of an individual or a community there always comes a time when a panacea is looked for that will cure all the ills existing. No small section of the planting community is regarding alternate-daily tapping as such a cure-all. It will solve the labor problem, because half the number of tappers can be used; the health of the trees will be promoted, because less bark will be consumed, and some believe that it will even prevent brown bast; overproduction and consequent low prices will be prevented, because there will be a reduction in output amounting to about 40 per cent.

It must be admitted that while estate managers are eager for a solution of labor troubles, they do not like the idea of a reduced crop. Therefore, it has been suggested to combine alternate-daily tapping with the practice of doubling the length of the tapping cut, using a half spiral or basal "V" cut. Such a system would probably still help in the labor problem, but the chance of overproduction and low prices remains the same, so that this suggestion will hardly be popular. In fact, the Rubber Growers' Association has already squelched it by recommending alternate-daily tapping without increasing the length of tap.

The association states that alternate-daily tapping will eventually prove the cheapest system.

THE CHINESE PLANTERS' ASSOCIATION.

A Chinese planters' association of Malaya has been formed at Penang, somewhat on the lines of the Planters' Association of Malaya. In the past, the latter association has often been handicapped because it could reach only a certain number of managers. It is expected that now the two associations together will be able to exercise greater control over the rubber industry of Malaya and it is hoped that they will cooperate as far as possible. Particularly in view of the labor shortage and the increasing demands of estate coolies, mostly Chinese, who in some cases get as much as $1.50 a day, it is hoped that the new association will have a beneficial effect.

MALAYAN NOTES.

It is reported that the assistant chemist of the local Department of Agriculture, S. W. Bunker, B. Sc., A. I. C., has resigned to take up a new billet with higher remuneration elsewhere. Much regret is expressed by the rubber industry of Malaya, which complains that the low salaries paid by the local government have caused seven good men to resign since 1917 and to go to such organizations as the R. G. A., the Holland-America Co., and the General Rubber Co.

The possibility of growing cotton in Malaya is receiving a good deal of attention. It has been suggested that as a catch crop for one year for rubber it would also be useful.

J. BREMNER AND A. R. COX, PARÁ, BRAZIL, HAVE FORMED A partnership under the name of Bremner & Cox, succeeding the former firms carried on by them individually as buyers and exporters of rubber and other Brazilian products, and will continue in the same business. The partnership dates from June 1, 1920.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED JULY 6, 1920.

NO. 1,345,406. Urethroscope. M. C. Rimmer, London, Eng.
1,345,417. Ballonnet gage. S. Truscott, Birmingham, Ala.
1,345,522. Demountable rim for tires. J. Walker, Canonsburg, Pa.
1,345,533. Parachute with inflated air bag closed at top and open at bottom. J. Chytracek, Clifton Mills, W. Va.
1,345,659. Automobile-tire rim. K. A. Beddingfield, assignor of one-half to R. D. Feagin—both of Macon, Ga.
1,345,670. Automobile-tire rim. H. H. Green, Salt Lake City, Utah.
1,345,777. Reinforced spring tire. H. H. Holdaway, assignor by mesne assignments to The Adams-Campbell Co., Inc.—both of Los Angeles, Cal.
1,345,812. Resilient tire with inflatable inner tube. E. Veltung, New York City, assignor by direct and mesne assignments to Veltung Steel Tire Co., a corporation of Delaware.
1,345,886. Rubber wedge for repair part for heels. L. Rosenfeld, New York City.
1,345,904. Sponge-rubber article and method of making the same. J. B. Wishart, Trenton, N. J.
1,345,987. Cushion support of layers of soft and hard rubber vulcanized together. F. W. Bocking, Rifle, Colo.
1,345,997. Casing for pneumatic tires. F. B. Carlisle, Andover, Mass., assignor to J. M. Gilbert, New York, N. Y.
1,345,998. Casing for pneumatic tires and process of making same. F. B. Carlisle, Andover, Mass., assignor to J. M. Gilbert, New York City.
1,346,032. Cushion tire. J. N. Keim, Mount Holly, N. J.
1,346,073. Valve cap for pneumatic tires. R. P. Adams, Lohrville, Iowa.
1,346,081. Circular bead core for tires. C. J. Drope, Minneapolis, Minn.

ISSUED JULY 13, 1920.

1,346,113. Pneumatic tire. S. L. Church, Houston, Tex.
1,346,176. Hot water bottle. A. R. Chambers, Winthrop, Mass.
1,346,184. Self-filling fountain pen. T. A. Dickinson, Youngstown, O.
1,346,336. Cushion tire. R. S. Reed, Kokomo, Ind.
1,346,342. Garter. J. K. Seymour, assignor of one-fifth to Milo H. Stearns and one-fifth to R. W. Kauffman—all of Elyria, O.
1,346,374. Armband or garter. A. L. Herrmann, Detroit, Mich.
1,346,421. Hose coupling. E. A. Russell and S. P. Harriman, assignors by mesne assignments to Roth Manufacturing Co.—all of Chicago, Ill.
1,346,422. Hose coupling. E. A. Russell and S. P. Harriman, assignors by mesne assignments to Roth Manufacturing Co.—all of Chicago, Ill.
1,346,423. Hose coupling. E. A. Russell and S. P. Harriman, assignors by mesne assignments to Roth Manufacturing Co.—all of Chicago, Ill.
1,346,424. Hose coupling. E. N. Roth, assignor to Roth Manufacturing Co.—both of Chicago, Ill.
1,346,425. Hose coupling. E. N. Roth, assignor to Roth Manufacturing Co.—both of Chicago, Ill.
1,346,448. Waterproof legging to be worn over clothing. H. W. Ewing, Columbus, O.
1,346,468. Sectional rim for pneumatic tires. G. Rubino, Turin, Italy.
1,346,510. Metal and rubber stopper for bottles, etc. H. P. Roberts, assignor by direct and mesne assignments to Rodik Manufacturing Co.—both of Boston, Mass. (See description elsewhere in this issue.)
1,346,514. Vehicle tire. W. Small and J. G. Small, Paterson, N. J.
1,346,599. Flat tire signal interposed between tube and casing. D. D. Getman, Minneapolis, Minn., and J. P. Sternhagen, Glasgow, Mont.—said Getman assignor to said Sternhagen.
1,346,627. Auxiliary detachable tire. W. Barber, New York, N. Y., assignor to Ada S. Barber, Brooklyn, N. Y.
1,346,632. Knitted fabric inner tube covering to embed foreign articles and reduce friction. F. S. Bennett, Philadelphia, Pa.
1,346,653. Closure with gasket for jars, bottles and other receptacles. A. Ingram and H. Ingram, assignors to Ingrams Incorporated—all of Brooklyn, N. Y.
1,346,654. Closure for jars, bottles and other receptacles. A. Ingram and H. Ingram, assignors to Ingrams Incorporated—all of Brooklyn, N. Y.
1,346,683. Glove with rubber membrane vulcanized upon outer surface only of body with circular ribbed portions on inside of hand and finger surfaces to facilitate gripping objects. J. N. Reynolds, Atlantic, Iowa. (See THE INDIA RUBBER WORLD, March 1, 1920, page 365; also, this issue, page 817.)
1,346,692. Resilient tire of alternate layers of fabric and rubber with circular cushion in center. A. Balaguer, Marianao, Havana, Cuba.
1,346,766. Resilient tire. J. A. Prince and A. L. Gilles, Nice, France.

REISSUES.

14,913. Repair vulcanizer. J. C. Heintz and G. Ruf, Cleveland, Ohio. Said Ruf assignor to said Heintz. (Original No. 1,262,598, dated April 9, 1918.)

ISSUED JULY 20, 1920.

1,346,834. Resilient rod of rubber with core of cork granules bonded together. C. E. McManus, New York, N. Y.
1,346,841. Removable heel lift with device for fastening in place. R. W. Padden, Kansas City, Mo.
1,346,912. Rubber band stamp. F. Pitman, East Kew, Victoria, Australia.
1,346,945. Pneumatic tire. C. Drouet, Houston, Tex.
1,346,991. Rubber ball having interior circular metallic strip held at one side of center. G. M. Tatum, Media, Pa.
1,347,021. Horseshoe with rubber cushion. T. S. Field, Atlanta, Ga.
1,347,029. Graining-tool. P. A. Gstalder, Pittsburgh, Pa., assignor to The Ohio Varnish Co., Cleveland, Ohio, a corporation of Ohio.
1,347,030. Graining tool. P. A. Gstalder, Pittsburgh, Pa., assignor to The Ohio Varnish Co., Cleveland, O.
1,347,144. Demountable rim for tires. W. J. Bruce, Sterling, Ill.
1,347,259. Amount certification rubber check stamp for banks. J. Derscha, Flint, Mich.
1,347,398. Douche can, with nipple provided with rubber sleeve. F. J. O'Rourke, New York City.
1,347,439. Soft rubber ring tire casing seal. G. H. Budd, Salt Lake City, Utah.

REISSUES.

14,920. Windshield cleaner. L. H. Morse and J. J. Tracy, Cleveland, O.—said Morse assignor to said Tracy. (Original No. 1,339,216, dated May 4, 1920.)

ISSUED JULY 27, 1920.

1,347,679. Pneumatic tire without inner tube. E. B. Brown, assignor to O. W. Fort, and H. R. Taylor—all of Los Angeles, Cal.
1,347,775. Insulating, waterproof sole for use on boots and shoes. H. M. Burr, Middletown, and G. J. Ingraham, West Hartford, assignors to The Omo Manufacturing Co.—all of Middletown, Conn.
1,347,800. Fountain pen. P. E. Wirt, Bloomsburg, Pa.
1,347,847. Tire casing. H. E. Grabau, Long Island City, N. Y., and A. C. Schwartz, New York City—said Grabau assignor to said Schwartz.
1,347,848. Tire casing fabric and method of manufacture. H. E. Grabau and A. C. Schwartz, New York City—said Grabau assignor to said Schwartz.
1,347,864. Suspensory with rubber tubing straps. S. A. Marker, Newark, N. J.
1,347,901. Fountain pen having device for retarding flow of ink. W. T. Fitzpatrick, Waterloo, Ia.
1,347,950. Reinforced pneumatic tire. G. Hofmann, assignor to Hofmann-Morgan Rubber Co.—both of Chicago, Ill.
1,347,953. Resilient tire. J. A. Horne, Newark, N. J.
1,347,993. Articulated effigy of prehistoric animal, having outer covering of elastic material. H. M. Dawley, Chatham, N. J.
1,348,005. Device for inserting plugs in tires. H. R. Hirst, Trenton, N. J.
1,348,094. Life-preserver helmet. D. Del Re, Iron River, Mich. (Original application divided.)
1,348,122. Demountable rim for tires. P. S. Larson, Beloit, Wis.
1,348,136. Shoe with rubber and fabric welted sole. E. W. Dunbar, assignor to Apsley Rubber Co.—both of Hudson, Mass.

THE DOMINION OF CANADA.

ISSUED JULY 6, 1920.

201,504. Wheel with pneumatic tire having enlarged edge. W. E. Beasley, Cheddington, County of Bucks, and W. Beedle, Watford, County of Hertz, coinventors—both in England.
201,553. Resilient cushion wheel. J. W. Fowler, Grey Lynn, Auckland, New Zealand.
201,558. Pneumatic tire. T. Gordon, Vancouver Island, B. C.
201,578. Puncture proof, combined solid and pneumatic tire. E. T. Lampard, Detroit, Mich., U. S. A.
201,590. Demountable split rim for tires. P. L. Munford, Birmingham, Ala., U. S. A.
201,624. Inflatable life preserver. F. Stebbing, Chicago, Ill., U. S. A.
201,699. Removable tire tread. The Snap-on Tread & Tire Co., assignee of J. C. Burlock—both of New York City, U. S. A.

ISSUED JULY 13, 1920.

201,774. Inflatable life preserver. L. Farr, El Portal, Calif., U. S. A.
201,781. Hard rubber fountain brush. C. A. Garvey, Clayton, Missouri, U. S. A.
201,795. Stocking supporter with chest and elastic back sections. H. Keys, Ellensburg, Wash., U. S. A.
201,905. Lather brush with bristles set in rubber and brush-containing handle. The American Safety Razor Corp., Brooklyn, assignee of M. B. Behrman, Tompkinsville—both in New York, U. S. A.
201,915. Running-board mat. The Essex Rubber Co., assignee of R. H. Phillips—both of Trenton, N. J., U. S. A. (See THE INDIA RUBBER WORLD, June 1, 1920, page 589.)

ISSUED JULY 20, 1920.

201,948. Rim for pneumatic tires. W. J. Stark, Vancouver, B. C., and S. R. Ramsey, Burbank, Wash., U. S. A., coinventors.
202,030. Demountable rim for tires. A. Mentzer, Duluth, Minn., U. S. A.
202,070. Rubber ear-protector. H. Hasselbeck, Mannheim, Grand Duchy of Baden, Germany.
202,128. Resilient tire with pneumatic tube. The Veltung Steel Tire Co. assignee of E. Veltung—both of New York City, U. S. A.
202,138. Demountable rim for tires. B. W. Brockett, assignee of W. F. Traves—both of Cleveland, O., U. S. A.
202,139. Demountable rim for tires. B. W. Brockett, assignee of W. F. Traves—both of Cleveland, O., U. S. A.

THE UNITED KINGDOM.

ISSUED JULY 7, 1920.

142,440. Device for beating furs, etc., with rubber mounts under levers. A. Lebel, 89 rue Pouchet, Paris, France. (Not yet accepted.)
142,449. Capsule or closure with rubber disk. C. Columbani, 46 avenue de la Republique, Bondy, and J. B. M. Liarsou, 27 rue du Poteau, Paris—both in France. (Not yet accepted.)
142,467. Steering and balancing device for heavier-than-air craft, captive balloons, boats, submarines, etc. The Goodyear Tire & Rubber Co., 1144 East Market street, assignee of R. H. Upson, 219 Shawnee Path—both of Akron, Ohio, U. S. A. (Not yet accepted.)

Chemical Patents will be found on pages 809, 810. Machinery Patents on pages 814, 815.

142,511. Teeth-cleaning and gum-massaging appliances with rotatable thin rubber discs. R. M. Withycombe, Wyoming, McQuarrie street, Sydney, Australia. (Not yet accepted.)
142,617. Reinforced pneumatic tire. S. Howell, Vicarage, Maenclochog, Clynderwen, Pembrokeshire.
142,718. Cushion wheels. A. A. Thornton, 8 Quality street, Chancery Lane, London. (Demountable Spring Tire Co., 1018 Federal Reserve Bank Building, St. Louis, Missouri, U. S. A.)
142,720. Brassiere with upper elastic breastband. E. W. Pattison, 51 Deansgate Arcade, Manchester. (Treo Co., 160 Fifth avenue, New York City, U. S. A.)
142,731. A resilient heel pad with metal frame embedded in it. J. H. Overton, 107 Spring street, Trenton, New Jersey, U. S. A.
142,768. Device for keeping rainwater out of cuts in rubber trees. S. J. Hally, 22 Kings avenue, Muswell Hill, London.
142,774. Peaks of caps and like headwear stiffened by a compressed fabric of rubber and canvas, etc. J. F. Key, 93 Hope street, Glasgow, Scotland.

ISSUED JULY 14, 1920.

142,791. Metal-studded fabric and leather tire cover. Societa Fabricazione Esportazione Coperturi Imperforabili Torino, 1 Via Accademia, Turin, Italy, assignees of G. Parenti and V. Messini. (Not yet accepted.)
142,987. Headguards with sponge-rubber pads. E. T. P. Goodyear, Colley Corner, Reigate Heath, Surrey.
143,129. Rubber tire with reinforced cavities closed with plugs of vulcanite, the cavities containing either air or sponge-rubber. J. Cairns, 61 Clifton Road, South Norwood, London.
143,135. Resilient cushion tire. Naamlooze Vennootschap Octrooimaatschappij Holland Tot Exploitatie van Uitvindingen, 209 Keizengracht, Amsterdam, Holland.

ISSUED JULY 21, 1920.

143,307. Reinforced tire. E. Lees, White Cross, Weymouth, Dorset, H. W. Ridsdale, Hill House, Burnham-on-Crouch, Essex, and T. H. Hirst, 3 Williams avenue, Wyke Regis, Dorset.
143,359. Cushion tire with soft rubber body and hard rubber base. S. Hill-Wood, Park Hall, Hayfield, Derbyshire, and W. T. Clifford-Earp, Marjoriebank, Laurel Road, Barnes, London.
143,408. Pneumatic tire. H. Wade, 111 Hatton Garden, London. (A. L. Cole, 164 Auburn street, Auburndale, Newton, Mass., U. S. A.)
143,434. Golf ball comprising a number of rubber-wound or other balls, with central weights, embedded in gutta percha, balata, or rubber, the whole being rubber-wound. A. F. Dimmock, 14 Princess Square, Harrogate, Yorkshire.
143,490. Fountain pen. C. Leoncini, 67 Via Ricasoli, Florence, Italy. (Not yet accepted.)

ISSUED JULY 28, 1920.

143,644. Reinforced inner tube. H. N. Wayne, 150 South Alexandria avenue, Los Angeles, California, U. S. A.
143,649. Reinforced pneumatic tire. P. Harder, 13 Nordre Frihavnsgade, Copenhagen, Denmark.
143,725. Hand basin of rubberized material, supported by collapsible frame. (For description see THE INDIA RUBBER WORLD, April 1, 1919, page 413.) C. J. Vieau, 291 Eastern Parkway, Brooklyn, New York; C. Wagner, 85 Washington avenue, Grantwood, New Jersey; and A. Hormel, 6 Charles street, New York, all in U. S. A.
143,801. Leather rubber-lined tobacco pouches. T. H. Bull, 10 Mortimer Road, Ealing, London.
143,802. Douche nozzles. W. J. Mellersh-Jackson, 28 Southampton Buildings, London. (J. Rose, 729 Halsey street, Brooklyn, New York, U. S. A.)
143,861. Device for closing punctures in tires. R. Brunner, Islikon, Thurgau, Switzerland. (Not yet accepted.)

GERMANY.

PATENTS ISSUED, WITH DATES OF ISSUE.

325,522. (July 2, 1915.) Substitute for solid rubber tires. Gummiwaren fabrik Louis Peter Aktien-gesellschaft, Frankfort-on-Main.
325,372. (December 1, 1918.) Heel protector made of a rubber band. Alexander Ungar, Budapest, Hungary.
325,373. (December 2, 1919.) Rubber heel with interchangeable walking surface. Peter Beiering, 26 Schiller Place, Bielefeld.
326,448. (June 11, 1916.) Inner tube with textile insert in cover. Albert Schipke, 18 Lauenburgerstrasse, Berlin-Wilmersdorf.
326,449. (February 6, 1920.) Cover for cycle tires. Ludwig Kleine, 22 Leopoldstrasse, Lichtenberg, and Paul Henke, 11 Kamminerstrasse, Charlottenburg.

DESIGN PATENTS ISSUED, WITH DATES OF ISSUE.

744,308. (May 20, 1920.) Rubber patch for shoe heels with special walking surface. Otto Roebel, 8 Neuer Graben, Dortmund.
744,309. (May 20, 1920.) Rubber heel patch. Otto Roebel, 8 Neuer Graben, Dortmund.
744,401. (May 21, 1920.) Shoe protector made from new or old rubber cuttings, or old pneumatic or solid tires. Martin Korth, 72 Von Quadtstrasse, Kölln-Dellbrück.
744,636. (May 21, 1920.) Hose for air pump. Franz Plath, 39 Gohliserstrasse, Dresden.
744,734. (June 3, 1920.) Rings cut from rubber of used automobile, motor, and cycle tires. Dr. Strauch and Paperle, Hanover-Dohren.
744,831. (May 12, 1920.) Leather-mounted rubber heel. Chr. Eifer, Haubersbronn, and O.-A. Schorndorf, Württemberg.
744,832. (May 12, 1920.) Leather-mounted rubber heel without corners. Chr. Eifer, Haubersthronn, and O.-A. Schorndorf, Württemberg.
745,343. (June 11, 1920.) Holder for rubber heels. Kurt Feige, 4-5 Sprengelstrasse, Berlin.
745,634. (June 16, 1920.) Rubber heel with space for insertion of leather insert. Willy Rothhaupt, 9 Nussbreite, Eisleben.
746,097. (June 18, 1920.) Rubber heel with center of hard material. Friedrich Theilmann, 54 Waldstrasse, Frankfort-on-Main-Niederrad.
746,176. (June 22, 1920.) Exchangeable shoe and heel cap of rubber with metal center. Josef Vitassi, Pola Via G., Venezia Giulia.
746,204. (June 7, 1920.) Finger ring with rubber insert for turning book pages. Ernst Gentzen, 30 Gr. Burgstrasse, Lübeck.
746,299. (June 22, 1920.) Rubber sole. Wood-Milne, Limited, London.
746,300. (June 22, 1920.) Rubber heel. Wood-Milne, Limited, London.

TRADE MARKS.

THE UNITED STATES.

No. 113,809. The word GABLE—rubber tires for motor cars and other vehicles. E. B. Killen, London, Eng.
115,026. Representation of a seal bearing head of a buffalo and the words TRADE MARK within white circle surrounded by a black circle containing the words VIOLET RAY SELF VULCANIZING PATCH in white letters all beneath the words BUFFALO BULL PATCH—patches for repairing inner tubes, rubber hot water bags, footwear, etc. H. R. Hoffeld, Buffalo, N. Y.
118,275. The word ROTARY—rubber tires and tubes. The Rotary Tire and Rubber Co., Zanesville, O.
118,355. Representation of a tire above the word SKIDDESE—anti-skidding rubber tires. P. Sangoff, Worcester, Mass.
118,930. The word PARCO—tires. The Pan-American Rubber Co., Milwaukee, Wis. (See THE INDIA RUBBER WORLD, March 1, 1920, page 366.)
119,233. The words JIFFY LOCK waterproof bathing suit bags. J. D. Farkas, New York City. (See THE INDIA RUBBER WORLD, August 1, 1919, page 638.)
119,351. The word LONDON—shoes of leather, rubber or fabric, or combinations of these, for men, women and children. London Shoe Co., New York City.
120,010. The word NOVLART—drawing outfits including rubber erasers. H. C. Mitchell, New York City.
120,436. The word SURETY—inner tubes. Surety Tire and Rubber Co., St. Louis, Mo.
121,683. The word GLOBESTOS—brake linings. United & Globe Rubber Co., Trenton, N. J.
121,795. The words LUCKY STRIKE—artificial baits of rubber, etc. The Thomson-Diggs Co., Sacramento, Cal.
122,743. The initials A-W in outline type within a double-bordered diamond—vulcanizers, molds, and other equipment for rubber manufacturers. The Williams Foundry and Machine Co., Akron, O.
123,675. Representation of scroll bearing the words WALKER'S GOLDEN WALKERITE—asbestos and rubber sheet packing. J. Walker & Co., Ltd., London, Eng.
123,676. The word LIPACKITE—asbestos and rubber steam and hydraulic packing. J. Walker & Co., Ltd., London, Eng.
123,677. The words DANDY LION—asbestos and rubber steam and hydraulic packings. J. Walker & Co., Ltd., London, Eng.
123,748. Representation of a house made of pens, within a double circle, standing on a scroll bearing the words THE PEN HOUSE—fountain pens and stylographic pens, etc. W. J. May & Co., Ltd., East Twickenham, Eng.
124,086. The word DELARE—rubber, leather, canvas and balata belting, rubber and metallic hose, steam and hydraulic packing, and pneumatic tires. Delaware Electric and Supply Co., Wilmington, Del.
124,695. Representation of label bearing the words HEAD OF THE LAKES and within a white oval a picture of a bridge over a body of water connecting two cities arm bands, garters and suspenders. Slonim Bros., Duluth, Minn.
124,827. Representation of a white-outlined black panel bearing in white the words "EVER-READY" SHAVING BRUSHES and the silhouette of a man's lathered face and his hand shaving with a safety razor—shaving brushes with bristles set in hard rubber. American Safety Razor Corp., Brooklyn, N. Y. (See THE INDIA RUBBER WORLD, March 1, 1915, page 329.)
126,615. The words HEL FI—rubber and fiber sheet packing. The Continental Supply Co., St. Louis, Mo.
127,724. The word KLEINERT'S—sanitary rubber sheets, rubber dams, sanitary aprons and belts, etc. I. B. Kleinert Rubber Co., New York City.
127,726. Representation of a maltese cross bearing the word KLEINERT suspended from a scroll bearing the words THE BEST—sanitary rubber sheets, rubber dam, sanitary aprons and belts, etc. I. B. Kleinert Rubber Co., New York City.
128,496. The word COMMANDER—fabric and rubber belting and diaphragms for paper mill vats and rubber hose reinforced with fabric or metal. The B. F. Goodrich Co., New York City.
128,948. The letter A with outline of a spade spot—hard rubber rods, sheets and tubes. American Hard Rubber Co., Hempstead, N. Y., and New York City.
129,677. The word BALLMATIC—pneumatic cells for filling pneumatic tires. W. H. Richards, Knoxville, Tenn.
130,092. The word MAGNUM—tires. The Dunlop Rubber Co., Ltd., London, Eng.
130,286. The word RAMBLER—inner tubes. The Ohio Rubber Co., Cincinnati, O.
130,481. The words LISTER-MINT—chewing gum, etc. Listerated Gum Corp., New York City.
130,646. The word CUERWAY—shoes of leather, rubber and fabric and combinations of these. Cuetara Bros., New York City.
130,873. Representation of a shield bearing two T's and the word QUALITY, beside a panel containing the words FOR DIVERS REASONS, the panel serving as a base for the words TRI-TEX—bathing caps, etc. Blum Bros., Chicago, Ill.
130,977. Representation of a slate bearing the words BOY'S SHOPS in white letters and the face of a boy silhouetted against a white oval—suspenders, garters, armbands, belts, etc.
131,337. The word "SHIRLASTIC" quoted—dress shields and garters. I. B. Kleinert Rubber Co., New York City.
131,472. The word PICHER enclosed within a conventional outline—zinc, etc. The Eagle-Picher Lead Co., Cincinnati, O.
131,474. The word PICHER enclosed within a conventional outline—chemicals and pigments for the rubber trade. The Eagle-Picher Lead Co., Cincinnati, O.
131,526. The words TEN-EIGHTY under the figures 1080—erasers of rubber or rubber composition. E. Faber, Brooklyn, N. Y.
131,580. The word SNUGS—rubber boots and shoes, rubber overshoes, and rubber-soled canvas shoes. Hood Rubber Co., Watertown, Mass.
131,603. Black isosceles triangle with one side horizontal across the top—brake linings. Staybestos Manufacturing Co., Philadelphia, Pa.
132,181. The words NU-WAY enclosed in a double-bordered diamond—dust caps for pneumatic tire valves. A. L. Just, Syracuse, N. Y.
132,445. The words AIR-PEDS—rubber or fiber soles and heels. Pioneer Products, Inc., New York City. (See THE INDIA RUBBER WORLD, April 1, 1920, page 434.)

132,634. The word ROLLICKERS within an oval—shoes made of leather, canvas and rubber. S. Freiburger & Bros., Fort Wayne, Ind.
133,217. The word SPRINGO—suspenders. J. A. Harps, Greenfield, O.

THE UNITED KINGDOM.

392,895. Representation of a seal bearing the words NEAL SON in the center and around it the words DANIEL NEAL & SONS, PHAT PHEET between two concentric circles—rubber or gutta percha heel tips, pads and protectors. Daniel Neal & Sons, Limited. 68-70 Edgware Road, London, W. 2, and 124-126 Kensington High street, London, W. 8.
392,901. Representation of a seal bearing the words PHAT PHEET in the center and around it the words NEAL SON, DANIEL NEAL & SONS between two concentric circles—rubber or gutta percha heel tips, pads and protectors. Daniel Neal & Sons, Limited. 68-70 Edgware Road, London, W. 2, and 124-126 Kensington High street, London, W. 8.
396,997. The word VESTA—rubber nipples for nursing-bottles. J. B. Marynissen, 45 avenue de France, Antwerp, Belgium. (Address for service in the United Kingdom, care of A. W. Brown, 16 Whitehall Park Road, Gunnersbury, London, W. 4.)
398,392. The word SPRINT—game balls and sporting goods. I. A. Fowler, 16 St. Nicholas street, and 73 Netherkirkgate, Aberdeen, Scotland.
398,393. The word NICK—game balls and sporting goods. I. A. Fowler, 16 St. Nicholas street, and 73 Netherkirkgate, Aberdeen, Scotland.
398,394. The word WHIZZBANG—golf balls. I. A. Fowler, 16 St. Nicholas street, and 73 Netherkirkgate, Aberdeen, Scotland.
398,395. The word WASP—footballs. I. A. Fowler, 16 St. Nicholas street, and 73 Netherkirkgate, Aberdeen, Scotland.
398,396. The word CHASE—game balls and sporting goods. I. A. Fowler, 16 St. Nicholas street, and 73 Netherkirkgate, Aberdeen, Scotland.
398,397. The word BOUNDARY—golf balls and sporting goods. I. A. Fowler, 16 St. Nicholas street, and 73 Netherkirkgate, Aberdeen, Scotland.
399,498. Representation of two vertically lined diamonds on each side of the letter G within a wreath formed of two conventionalized leaves tied with ribbon bow—rubber tires. The B. F. Goodrich Co., 1780 Broadway, New York City, U. S. A. (Address for service in the United Kingdom, care of White, Langner, Stevens & Parry, 88-90 Chancery Lane, London, W. C. 2.)
401,004. The word LUXORA—rubber and gutta percha goods not included in classes other than No. 40. Ingram Brothers, Limited, 9 Woodstock street, Oxford street, London, W. 1.
401,651. Representation of a quill pen crossed obliquely by the words BALLON DE POCHE "PLUME"—deflatable rubber balls, included in Class 49. Etablissements Bognier & Burnet, 21-23 rue des Filles du Calvaire, Paris, France. (Address for service in the United Kingdom, care of Haseltine, Lake & Co., 28 Southampton Buildings, London, W. C. 2.)
401,875. The word ALTURA—fountain and stylographic pens included in Class No. 39. A. F. Tero, 26-27 Hatton Garden, London, E. C. 1.
401,894. The word LEWCOS—textile-covered, rubber-insulated electric light and telephone wires. The London Electric Wire Company and Smiths, Limited, 7 Playhouse Yard, Golden Lane, London, E. C. 1.
402,182. Representation of a 6-pointed star within a tire, giving out rays of light between the points and bearing the letter L, all above the word ELINSTAR—rubber and gutta percha goods, except tobacco pouches, not included in classes other than No. 40. F. Longdon & Co., Limited, 17 Agard street, Derby.
402,887. Representation in black and white of a negro running with a shield and spear, above the words THE "NIGGER" STYLO—stylographic pens. The Wyvern Fountain Pen Co., 143-144 Holborn, London, E. C. 1.

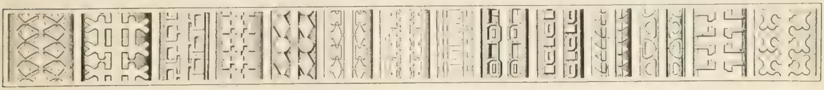
THE DOMINION OF CANADA.

26,541. The word UNIVERSAL—rubber tires, tubes, reliners, patches, tobacco pouches, invalid rings, ice bags, football bladders and accessories. Ames-Holden-McCready, Limited, Montreal, Quebec.
26,586. The word MAGNUM—tires (automobile, bicycle, motorcycle and solid), rubber belting, garden hose, packing, heels and soles, golf balls and rubber cements. Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ontario.
26,587. The word PERICLES—tires (automobile, bicycle, motorcycle and solid), rubber belting, garden hose, packing, heels and soles, golf balls and rubber cements. Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ontario.
26,730. Representation of a fanciful figure showing a globe encircled by stars and a triple circular border, together with the words: "THE MANHATTAN RUBBER MANUFACTURING CO., PASSAIC, N. J."—belting, hose, packing and tires. The Manhattan Rubber Co., Passaic, N. J., U. S. A.
26,747. Representation of a man wearing a helmet intended to represent the Shakespearean character Pericles, Prince of Tyre, and the words: "PERICLES, PRINCE OF TYRE, SHAKESPEARE"—tires. The Dunlop Rubber Co., Limited, Dunlop House, 1 Albany street, London, N. W. 1, England.

DESIGNS.

THE UNITED STATES.

No. 55,585. Tire. Patented July 6, 1920. Term 7 years. G. E. Batcheller, Forest Hills, N. Y.
55,586. Tire casing. Patented July 6, 1920. Term 14 years. R. D. Belden, Marion, O.
55,588. Tire tread. Patented July 6, 1920. Term 3½ years. W. O. Bruess, Port Clinton, O.
55,600. Tire. Patented July 6, 1920. Term 14 years. T. Follen, La Fayette, Ind.
55,606. Tire. Patented July 6, 1920. Term 14 years. C. W. Green, assignor to The Bowling Green Rubber Company—both of Toledo, O.
55,611. Tire tread. Patented July 6, 1920. Term 7 years. C. O. Henderson, assignor to Henderson Tire and Rubber Corp.—both of Columbus, O.
55,612. Tire tread. Patented July 6, 1920. Term 7 years. C. O. Henderson, assignor to Henderson Tire and Rubber Corp.—both of Columbus, O.
55,627. Bulletin board representing a man seated behind a desk with tire leaning against the end of it. Patented July 6, 1920. Term 7 years. H. J. Mahin, New York City.
55,630. Tire. Patented July 6, 1920. Term 14 years. R. P. McElrath, Lakewood, O.
55,728. Tire. Patented July 6, 1920. Term 14 years. E. A. Tinsman, Willoughby, O., assignor to W. C. Owen, Cleveland, O.
55,729. Tire. Patented July 6, 1920. Term 14 years. E. A. Tinsman, Willoughby, assignor to W. C. Owen, Cleveland—both in Ohio.
55,730. Rubber boot. Patented July 6, 1920. Term 14 years. N. E. Tousley, Belmont and A. H. Whorf, assignors to Hood Rubber Co., all of Watertown, Mass.
55,768. Tire. Patented July 13, 1920. Term 7 years. A. S. Fox, Chicago, Ill.
55,787. Raincoat. Patented July 13, 1920. Term 7 years. B. Greenberg, Chicago, Ill.
55,803. Tire-cover. Patented July 13, 1920. Term 14 years. P. M. Lockwood, Kansas City, Mo.
55,804. Tire-cover. Patented July 13, 1920. Term 7 years. P. M. Lockwood, Kansas City, Mo.



55,585 55,586 55,588 55,600 55,606 55,611 55,612 55,630 55,728 55,729 55,808 55,813 55,832 55,842

402,975. The word ONAZOTE—rubber tires, tubes, and shock absorbers. C. L. Marshall, Duncon, Doyle Gardens, Harlesden, London, N. W. 10.
403,339. The word SAMORE—rubber and gutta percha goods not included in classes other than No. 40. Samuel Hoare, 40 Sandringham Road, Dalston, London, E. 8.
403,388. Representation of a fountain within a rectangle with the word STANDARD behind the top of the fountain—fountain and stylographic pens, etc. C. Bristow, The Pen Works, Waldram Road, Forest Hill, London, S. E. 23.

NEW ZEALAND.

16,618. Representation of a tire with a partridge standing within the lower part—pneumatic and solid tires, inner tubes, casings, tire accessories, mechanical rubber goods, druggists' sundries, and all other goods manufactured from india rubber and gutta percha not included in classes other than No. 40. The F. E. Partridge Rubber Co., Limited, Guelph, Ontario, Canada.
16,619. The word PARTRIDGE—rubber footwear. The F. E. Partridge Rubber Co., Limited, Guelph, Ontario, Canada.
16,620. The word PARTRIDGE—pneumatic and solid tires, inner tubes, casings, and tire accessories; mechanical rubber goods, druggists' sundries; and all other goods manufactured from india rubber and gutta percha not included in classes other than No. 40. The F. E. Partridge Rubber Co., Limited, Guelph, Ontario, Canada.

THE DOMINION OF CANADA.

26,539. The words TIRE TRED—rubber footwear, heels and soles, clothing, belting, hose, tires, insulating material, cement, druggists' and plumbers' supplies, etc. The Miner Rubber Co., Limited, Montreal, Quebec.

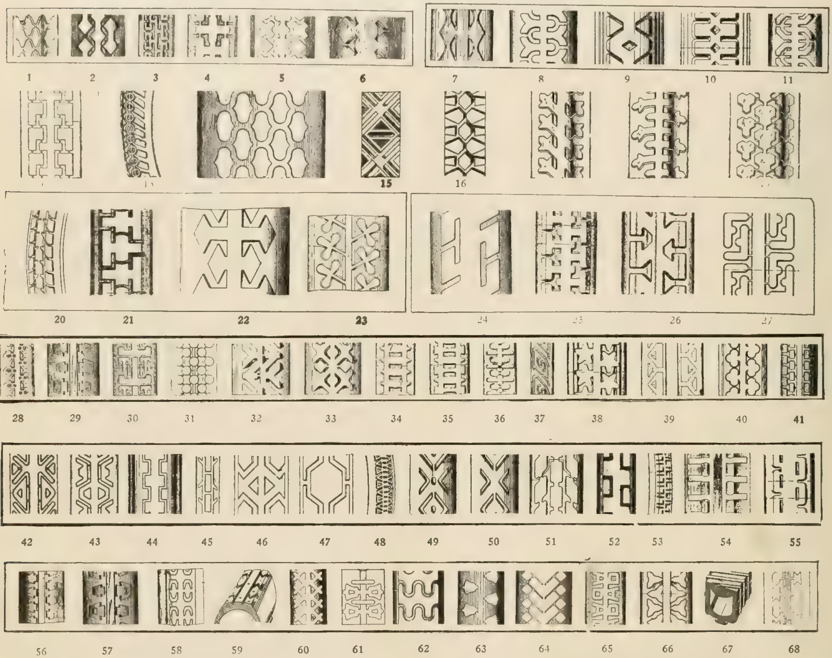
55,805. Bulletin board in form of tire with arrow pointing through it. Patented July 13, 1920. Term 7 years. H. J. Mahin, New York City, assignor to Syracuse Rubber Co., Syracuse, N. Y.
55,808. Tire tread. Patented July 13, 1920. Term 14 years. J. A. McLane, assignor to the Armorcord Rubber Co.—both of Morgantown, W. Va.
55,813. Tire-casing. Patented July 13, 1920. Term 7 years. W. C. Owen, Cleveland, O.
55,826. Garter. Patented July 13, 1920. Term 7 years. J. A. Stih, La Salle, Ill.
55,832. Tire. Patented July 13, 1920. Term 14 years. E. H. Trump, assignor to the Biltwell Tire and Rubber Co.—both of Barberton, O.
55,842. Tire tread. Patented July 20, 1920. Term 14 years. A. L. Breitenstein, Akron, O., assignor to Wilson Rubber Co., Des Moines, Ia.

THE DOMINION OF CANADA.

4798. Tire tread. Patented June 22, 1920. Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ontario.
4799. Tire tread. Patented June 22, 1920. Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ontario.
4800. Tire tread. Patented June 22, 1920. Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ontario.
4801. Tire tread. Patented June 22, 1920. K. & S. Tire & Rubber Goods, Limited, Toronto, Ontario.
4802. Tire tread. Patented June 22, 1920. K. & S. Tire & Rubber Goods, Limited, Toronto, Ontario.
4,811. Swimming belt. Patented July 6, 1920. S. Kelso, Toronto, Ont.

Pneumatic Tire Tread Designs.

October, 1919, to March, 1920, and May, 1920.



Cut No.	Patent No.	Patentee or Assignee and Address.
(1).	54,720.	The Knox Tire & Rubber Co., Mt. Vernon, Ohio.
(2).	54,725.	J. Christy, Cleveland, Ohio.
(3).	54,740.	The Quality Tire & Rubber Co., Anderson, Ind.
(4).	54,758.	L. B. Lyman, Tallmadge, Ohio.
(5).	54,797.	M. L. Wiener, Akron, Ohio.
(6).	54,844.	Kelly-Springfield Tire Co., New York City.
(7).	53,709.	The Bowling Green Rubber Co., Toledo, Ohio.
(8).	53,727.	Richard J. Birch, Cleveland, Ohio.
(9).	53,749.	Ajax Rubber Co., Inc., Millbrook, N. Y.
(10).	53,750.	Ajax Rubber Co., Inc., Millbrook, N. Y.
(11).	53,672.	Richard J. Birch, Cleveland, Ohio.
(12).	53,858.	Arthur E. Pearce, Ashtabula, Ohio.
(13).	53,855.	Premier Tire & Rubber Co., Kansas City, Missouri.
(14).	53,845.	Walter R. Denman, Cleveland, Ohio.
(15).	53,692	Thermoid Rubber Co., Trenton, New Jersey.
(16).	53,693.	Thermoid Rubber Co., Trenton, New Jersey.
(17).	53,675.	Isaac R. Davies, Lakewood, Ohio.
(18).	53,676.	Isaac R. Davies, Lakewood, Ohio.
(19).	53,677.	Isaac R. Davies, Lakewood, Ohio.
(20).	53,972.	Benjamin H. Pratt, Milwaukee, Wisconsin.
(21).	53,949.	The Standard Tire Co., Willoughby, Ohio.
(22).	53,971.	Arthur E. Pearce, Ashtabula, Ohio.
(23).	53,940	Harry J. Smith, Binghamton, N. Y.
(24).	53,894.	Walter R. Denman, Cleveland, Ohio.
(25).	53,899.	The Erie Tire & Rubber Co., Cleveland, Ohio.
(26).	53,931.	Frederick A. Oberheu, Detroit, Michigan.
(27).	53,964.	The Williams Foundry & Machine Co., Akron, Ohio.
(28).	54,063.	The Portage Rubber Co., Barberton, Ohio.
(29).	54,070.	F. S. Dickinson, New York City.
(30).	54,090.	G. F. Hoffman, Akron, Ohio.
(31).	54,114.	C. L. Moody and T. Midgely, Springfield, Massachusetts.
(32).	54,120.	The Yale Tire & Rubber Co., New Haven, Connecticut.
(33).	54,121.	The Yale Tire & Rubber Co., New Haven, Connecticut.
(34).	54,122.	The B. F. Goodrich Co., New York City.
(35).	54,123.	The B. F. Goodrich Co., New York City.
(36).	54,124.	The B. F. Goodrich Co., New York City.
(37).	54,143.	H. F. Stansbury and J. F. Davis, Scranton, Pennsylvania.
(38).	54,153.	The Star Rubber Co., Akron, Ohio.
(39).	54,185.	The Victor Rubber Co., Springfield, Ohio.
(40).	54,186.	R. H. Syfers, Indianapolis, Indiana.
(41).	54,193.	The Black Hawk Tire & Rubber Co., Des Moines, Iowa.
(42).	54,236.	The Madison Tire & Rubber Co., Inc., Buffalo, N. Y.
(43).	54,237.	The Madison Tire & Rubber Co., Inc., Buffalo, N. Y.
(44).	54,255.	C. C. Gates, Denver, Colorado.
(45).	54,262.	The Fisk Rubber Co., Chicopee Falls, Massachusetts.
(46).	54,263.	The Fisk Rubber Co., Chicopee Falls, Massachusetts.
(47).	54,264.	The Fisk Rubber Co., Chicopee Falls, Massachusetts.
(48).	54,276.	The Gordon Tire & Rubber Co., Canton, Ohio.
(49).	54,286.	The Savage Tire Co., San Diego, California.
(50).	54,287.	The Savage Tire Co., San Diego, California.
(51).	54,291.	J. Tenney, Jr., Plainfield, N. J.
(52).	54,321.	H. L. Kenyon, Satauket, N. Y.
(53).	54,324.	The Brunswick-Balke-Collender Co., Chicago, Illinois.
(54).	54,337.	F. W. Smith, Rutherford, N. J.
(55).	54,347.	The Cord Tire Corp., Chester, West Virginia.
(56).	54,246.	F. S. Dickinson, New York City.
(57).	54,247.	F. S. Dickinson, New York City.
(58).	54,248.	E. N. Downes, Charlotte, North Carolina.
(59).	54,261.	E. Hopkinson, New York City.
(60).	54,278.	Empire Rubber & Tire Co., Trenton, New Jersey.
(61).	54,281.	F. C. Plouf, Minneapolis, Minnesota.
(62).	54,290.	Gillette Rubber Co., Eau Claire, Wisconsin.
(63).	54,306.	Liberty Tire & Rubber Co., Green Bay, Wisconsin.
(64).	54,318.	Proehl Tire & Rubber Co., Chicago, Illinois.
(65).	54,329.	G. Nowick, Kansas City, Missouri.
(66).	54,330.	W. C. Owen, Cleveland, Ohio.
(67).	54,345.	T. Zeger, Sharpsburg, Pennsylvania.
(68).	54,348.	H. G. Egbert, Dayton, Ohio.

Review of the Crude Rubber Market.

The curtailment in tire production that commenced in July was continued during August and is now at the lowest level known in the history of the industry. This means that 8,000 tons of crude rubber consumed monthly in tires must be carried over until conditions change. The industry as a whole, however, is in strong hands, and competent to cope with the unusual situation.

Depression ruled in the crude rubber market during the first week of August, when small interest was shown by manufacturers or dealers other than small lot buying for immediate requirements. The report of another liquidation in the rubber importing business further depressed the market, resulting in a new low level of 29½ cents for both latex crêpe and smoked sheet ribbed, spot rubber.

Quiet conditions continued throughout the month, with slight price advances, due to contract covering on the part of short interests that gave support to a market technically weak through lack of manufacturers' business. The situation is top-heavy. Rubber is constantly going into storage in New York, 20,000 tons being the reported figure, and factory store rooms are filled with rubber.

Arrivals during July were 15,884 tons, compared with 17,965 a year ago. Total arrivals for seven months ended July 31, 1920, were 167,773 tons, compared with 131,694 tons last year. Future arrivals will be less and less, as buying has been restricted in producing centers and surplus stocks stored by the large holders, who are abundantly prepared to meet the temporary contingency.

Spot and future quotations on standard plantation and Brazilian sorts at the first and last of the past month were as follows:

Plantations. August 2, first latex crêpe, spot, 30 cents; October-December, 34½ cents; January-June, 39¼ cents.

August 26, first latex crêpe, spot, 31 to 31½ cents; October-December, 34 cents; January-June, 38 to 38½ cents.

August 2, ribbed smoked sheets, spot, 29½ cents; October-December, 34 cents; January-June, 39 cents.

August 26, ribbed smoked sheets, spot, 30 to 30½ cents; October-December, 33 to 33½ cents; January-June, 37 cents.

August 2, No. 1 amber crêpe, spot, 29 cents.

August 26, No. 1 amber crêpe, spot, 28 to 29 cents.

August 2, No. 1 rolled brown crêpe, spot, 25 cents.

August 26, No. 1 rolled brown crêpe, spot, 24 cents.

South American Parás and Caucho. August 2, upriver, fine, spot, 34½ cents; islands fine, 32 cents; upriver coarse, 22 cents; islands coarse, 20 cents; Cametá coarse, 18 cents; caucho ball, 23¾ cents.

August 26, upriver fine, spot, 31 to 30 cents; islands fine, 28 cents; upriver coarse, 21½ to 22 cents; islands coarse, 19 cents; Cametá coarse, 17 cents; caucho ball, 22 cents.

NEW YORK QUOTATIONS.

Following are the New York spot quotations, for one year ago, one month ago, and August 26, the current date:

	September 1, 1919.	August 2, 1920.	August 26, 1920.
PLANTATION HEVEA—			
First latex crêpe	$0.45½ @	$0.30 @	$0.31 @
Amber crêpe No. 1	.41½ @	.29 @	.29 @
Amber crêpe No. 2	.40½ @	.28 @	.28 @
Amber crêpe No. 3	.39½ @	.28½ @	.27 @
Amber crêpe No. 4	.38½ @	.27½ @	.26 @
Brown crêpe, thick and thin	.38½ @	.29 @	.26 @
Brown crêpe, specky	.36½ @	.28 @	.25 @
Brown crêpe, rolled	.32 @	.25 @	.24½ @
Smoked sheet, ribbed, standard quality	.44 @	.29½ @	.30 @ .30½
Smoked sheet, plain standard quality	.41 @	.30 @	.29 @
PLANTATION HEVEA—	September 1, 1919.	August 2, 1920.	August 26, 1920.
Unsmoked sheet, standard quality	$0.39 @	$0.25 @	$0.26 @
Colombo scrap No. 1	.33 @	.23 @	.22 @
Colombo scrap No. 2	.31 @	.21½ @	.21½ @
EAST INDIAN—			
Assam crêpe	*.58 @	@	@
Assam onions	@	@	@
Penang black scrap	*.40 @	@	@
PONTIANAK—			
Banjermassin	.10¼ @	.12 @	.09¾ @ .11½
Palembang	.11¾ @ .12	.13 @	.10¼ @
Pressed block	.21 @	.23 @	.19 @
Sarawak	.09¾ @	@	.08¾ @
SOUTH AMERICAN—			
PARAS—			
Upriver fine	.54½ @	.34½ @ .35	.31 @ .30
Upriver medium	.51½ @	.30 @	.29 @ .30
Upriver coarse	.31½ @	.22 @	.21½ @ .22
Upriver weak, fine	.40 @	.30 @	.27 @
Islands, fine	.48 @	.32 @	.28 @
Islands, medium	.44 @ .45	.30 @	*.26 @ .28
Islands, coarse	.21 @	.20 @	.19 @
Cametá, coarse	.21½ @	.18 @	.17 @
Madeira, fine	.55 @	.37 @	.35 @
Acre Bolivian, fine	.54½ @ .55	.36 @	.33½ @ .34
Peruvian fine	.53 @	.32 @	.31 @
Tapajos, fine	.53 @	.30 @	.30 @ .31
CAUCHO—			
Upper caucho ball	.31 @	.24 @	.21½ @ .22
Lower caucho ball	.29 @	.21 @	.18½ @
MANICOBAS—			
Ceará negro heads	*.34 @	@	.23 @
Ceará scrap	*.29 @	@	.20 @
Manicoba, 30% guarantee	*.32 @	@	.25 @
Mangabeira thin sheet	*38 @	@	.28 @
CENTRALS—			
Corinto scrap	.31 @	.19 @	.18 @
Esmeralda sausage	.31 @	.19 @	.18 @
Central scrap	.31 @	-19 @	.18 @
Central scrap and strip	.29½ @	.17 @	.15 @
Central wet sheet	.23 @	.13 @	.13 @
Guayule, 20% guarantee	.25 @	.28 @	.27 @
Guayule, washed and dried	.35 @	.38 @	.37 @
AFRICANS—			
Niger flake, prime	@	.18¾ @	@
Benguela, extra No. 1, 28%	*.24 @	.14 @	@
Benguela, No. 2, 32½%	*.25 @	@	@
Conakry niggers	@	@	@
Congo prime, black upper	.34½ @	@	@
Congo, prime, red upper	.34 @ .35	@	@
Kassai black	@	@	@
red	@	@	@
Massai sheets and strings	@	@	@
Rio Nunez ball	@	@	@
Rio Nunez sheets and strings	@	@	@
GUTTA PERCHA—			
Gutta Siak	.20 @ .23	.24 @ .25	.20½ @ .22½
Red Macassar	2.50 @ 2.60	2.80 @	2.00 @ 2.95
BALATA—			
Block, Ciudad Bolivar	.70 @ .74	.72 @	.67 @ .68
Colombia	.56 @ .58	.50 @ .51	.47 @
Panama	.45 @ .48	@	.40 @
Surinam sheet	.90 @ .92	.73 @	.75 @
amber	.92 @ .94	.82 @	.82 @

*Nominal.

RECLAIMED RUBBER.

August business in reclaimed rubber has continued to be quiet and in about the same volume as the previous month. Transportation facilities have improved somewhat, with the result that deliveries are being made more promptly, although delays are still experienced. The tire production curtailment has to a certain degree affected this market, and is reflected in fewer inquiries from solid tire makers. Prices on all grades are practically the same as a month ago.

NEW YORK QUOTATIONS.

August 26, 1920.

Prices subject to change without notice.

STANDARD RECLAIMS:	
Floating	$0.27 @ $0.32
Friction	.25 @ .30
Mechanical	.12 @ .13
Red	.22 @ .23
Shoe	.15¼ @ .16½
Tires, auto	.16 @ .17
truck	.12½ @ .13½
White	.22 @ .25

THE MARKET FOR COMMERCIAL PAPER.

In regard to the financial situation, Albert B. Beers, broker in crude rubber and commercial paper, No. 1 Liberty street, New York City, advises as follows:

"During August the demand for commercial paper has been very limited, and almost entirely from out-of-town banks, rates ruling at 8 to 8½ per cent for the best rubber names."

COMPARATIVE HIGH AND LOW NEW YORK SPOT RUBBER PRICES.

	August.		
	1920.*	1919.	1918.
PLANTATIONS—			
First latex crêpe ..	$0.33¾ @ $0.29½	$0.42½ @ $0.39½	$0.63 @ $0.63
Smoked sheet ribbed	.33¾ @ .29½	.41½ @ .38½	.62 @ .62
PARAS—			
Upriver, fine.......	.35 @ .27½	.54¼ @ .55	.68 @ .68
Upriver, coarse ..	.23½ @ .20½	.33 @ .32	.40 @ .40
Islands, fine	.32 @ .29	.47½ @ .47½	.59 @ .59
Islands, coarse ..	.20 @ .19	.21½ @ .21½	.27 @ .27
Cameta	.18 @ .18	.21½ @ .21½	.28 @ .28

*Figured to August 26.

AMSTERDAM RUBBER MARKET.

JOOSTEN & JANSSEN, Amsterdam, report [August 14, 1920]:

In the beginning of the week prices of rubber showed a further downward movement and the tendency remained quiet. There was a fair demand, but at moderate prices. Some owners of spot parcels were rather inclined to sell, and when they could dispose of their lots at satisfactory prices, they made use of this opportunity, in consequence of which there was after all a good turnover. Only now and then there was any business on the terminal market; prices remained practically unchanged. At the close prime *Hevea* on spot is quoted at f. 1.12; October, f. 1.12; December, f. 1.15; March, f. 1.16; with sellers; buyers, 2 cents lower.

ANTWERP RUBBER MARKET.

GRISAR & CO., Antwerp, report [July 30, 1920]:

The market tendency continues feeble in consequence of the absence of orders for the United States. Prices have still further declined, and little business was done. Closing prices were as follows: Spot, July, 1*s.* 9¼*d*; August-September, 1*s.* 9½*d.*—1*s.* 10½*d.*; August-December, 1*s.* 10½*d.*—1*s.* 10¾*d.*; January-March, 2*s.*—2*s.* 1*d.* Fine Pará, 1*s.* 10¼*d.*

Statistics for the week were as follows: Arrivals, 1,047 tons; sales, 627 tons; stock, 24,105 tons against 27,602 in 1919.

Small quantities of African rubber were sold; 263 kilos of red Congo Kassai I and II, at 7.50 francs; 651 red Congo Kassai, Butala grade, at 5.50 francs; 1,760 kilos Congo Plantation *Hevea* and some *Funtumia* at secret price.

Arrived per S. S. *Matebi*: Various, 3,125 kilos. Stock on hand, about 755 tons.

Weak reports from London caused the local futures market price to decline 0.70 francs; at this new rate, buyers have the advantage. Transactions amounting to only 30,000 kilos were made. Closing quotations, each month: August-July, 9.80 francs. Tendency, quiet.

SINGAPORE RUBBER MARKET.

GUTHRIE & CO., LIMITED, Singapore, report [July 15, 1920]:

Lower London quotations, news of a demoralized New York market and rumors of a failure in that quarter, have had a considerable weakening effect on our market since we last reported and the attendance at the opening of the weekly rubber auction yesterday was poor with few buyers. The earlier catalogs were more or less neglected, but later a moderate demand sprang up, on sellers showing a desire to meet buyers on such lots as they were interested in. The bidding was confined to standard and lower grades, off quality lots of sheet and crêpe being unsalable.

Fine pale crêpe sold up to 73 cents (two lots sold at 73½ cents) and ribbed smoked sheet fetched 73½ cents (one lot in cases sold at 74½ cents and four lots loose at 74 cents) showing declines of 3½ and 3 cents, respectively. Brown crêpes shared in the general decline and were 3/6 cents cheaper on the week, while dark and barky crêpes dropped 2/4 cents. The tone of the market may be judged from the fact that only 420 tons were sold out of a catalogued quantity of 904 tons.

The following is the course of values:

	In Singapore per Pound.[1]	Sterling Equivalent per Pound in London.
Sheet, fine ribbed smoked.......	72c @ 73½c	1/10⅝ @ 1/11
Sheet, good ribbed smoked....	58 @ 72	1/6⅝ @ 1/10⅝
Crêpe, fine pale..............	72 @ 73	1/11⅛ @ 1/11⅜
Crêpe, good pale..............	58 @ 72	1/7⅛ @ 1/11⅛
Crêpe, fine brown.............	58 @ 63	1/7⅛ @ 1/8½
Crêpe, good brown.............	53 @ 56½	1/5¾ @ 1/6¾
Crêpe, dark	48 @ 51	1/4¼ @ 1/5⅛
Crêpe, bark	41 @ 45	1/2 @ 1/3½

[1]Quoted in Straits Settlements currency; $1 = $0.567 United States currency.

EXPORTS OF CRUDE RUBBER FROM BELAWAN (DELI), SUMATRA.

	April.		Four Months Ended April 30.	
	1919.	1920.	1919.	1920.
To Netherlands .....*kilos*	......	267,424	....	998,892
United Kingdom......	498,689	302,930	1,431,545	1,132,914
Italy	....	....	61,120	....
Belgium	......	54,040	....	54,135
United States	306,762	639,037	2,134,486	3,618,335
Penang	28,750	44,047	97,842	259,632
Singapore	835,114	639,279	4,709,846	1,877,679
Japan	......	....	980	....
Australia	29,010	.....	177,690	....
Totals ....*kilos*	1,698,325	1,886,757	8,613,509	8,491,587

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official report from Singapore states that the export of cultivated rubber from Straits Settlements ports in the month of June amounted to 11,663 tons (of which 1,976 tons were transshiped). This compares with 15,617 tons in May and 5,059 tons in the corresponding month last year. The total exports for the first half of the current year amounted to 79,435 tons, as against 82,725 tons last year and 42,180 tons in 1918. The following are the comparative statistics:

	1918.	1919.	1920.
January ....*tons*	4,302	14,404	13,125
February	2,334	15,661	17,379
March	8,858	20,908	5,931
April	6,584	10,848	15,720
May	13,587	15,845	15,617
June	6,515	5,059	11,663
Totals	42,180	82,725	79,435

FEDERATED MALAY STATES RUBBER EXPORTS.

An official report from Kuala Lumpur states that the exports of plantation rubber from the Federated Malay States for the month of June amounted to 9,049 tons, compared with 7,627 tons in May and 7,094 tons in the corresponding month last year.

The total exports for six months in the current year were 55,475 tons, against 50,717 tons for the corresponding period last year and 40,557 tons in 1918. Appended are the comparative statistics:

	1918.	1919.	1920.
January ....*tons*	7,588	7,163	11,119
February	6,820	10,809	9,781
March	7,709	10,679	9,524
April	7,428	7,664	8,375
May	5,851	7,308	7,627
June	5,161	7,094	9,049
Totals	40,557	50,717	55,475

PLANTATION RUBBER EXPORTS FROM JAVA.

	May.		Five Months Ended May 30.	
	1919.	1920.	1919.	1920.
To Netherlands ....*kilos*	2,000	318,000	122,000	1,850,000
Great Britain	780,000	407,000	3,681,000	2,731,000
Germany	....	17,000	....	35,000
France	....	....	176,000	....
Belgium	.....	14,000	....	14,000
United States	1,255,000	1,362,000	7,876,000	7,041,000
Singapore	545,000	176,000	2,536,000	1,884,000
Japan	1,000	6,000	179,000	184,000
Australia	......	30,000	*	46,000
Other countries	....	....	175,000	....
Totals ....*kilos*	2,583,000	2,330,000	14,745,000	13,785,000
Ports of origin:				
Tandjong Priok	1,677,000	1,274,000	7,598,000	6,665,000
Samarang	40,000	8,000	243,000	194,000
Soerabaya	865,000	1,045,000	6,328,000	11,800,000

*Not elsewhere specified.

RUBBER EXPORTS FROM PENANG.

	Six Months Ended June 30.	
	1919.	1920.
To Great Britain ....*piculs*[1]	113,015	121,115
Europe	......	1,544
United States	60,469	103,651
Totals..............................	173,484	226,310

[1] One picul equals 133⅓ pounds.

CEYLON RUBBER IMPORTS AND EXPORTS.

IMPORTS.

	January 1, to July 12.	
Crude rubber:	1919.	1920.
From Straits Settlements .... *pounds*	1,386,797	1,555,099
India	710,084	791,039
Burma and other countries..........	......	26,259
Totals	2,096,881	2,372,397

EXPORTS.

	1919.	1920.
Crude rubber:		
To United Kingdom........................	17,354,739	17,869,744
Belgium	29,120	106,830
France	330,010	440,817
Germany	......	108,228
Netherlands	......	28
Italy	......	89,600
Australia	......	56
Victoria	98,755	89,669
United States	37,308,831	22,078,498
New South Wales...........................	127,092	180,094
Canada and Newfoundland...................	260,026	425,600
India	2,313	586
Straits Settlements	454	44,800
Japan	164,186	157,667
Totals	55,675,526	41,592,217

(Compiled by the Ceylon Chamber of Commerce.)

CRUDE RUBBER ARRIVALS AT ATLANTIC AND PACIFIC PORTS AS STATED BY SHIPS' MANIFESTS.

PARAS AND CAUCHO AT NEW YORK.

July [illegible]. By the S. S. *Manco*, from Pará.

	Fine.	Medium.	Coarse.	Caucho.	Totals. Pounds.
Poel & Kelly	......	......	......	......	33,516
H. A. Astlett & Co.	5,000	......	14,0[illegible]	......	......
Neuss, Hesslein & Co	......	......	......	......	36,2[illegible]0
Wm. Schall & Co.	......	......	......	......	13,034
Meyer & Brown, Inc	......	18,742	13,230	4,410	36,382

July 24. By the S. S. [illegible], from Manáos.

Poel & Kelly	......	......	......	......	12,936
W. R. Grace & Co.	......	......	......	......	3,136
Various	......	......	......	......	27,832

July 24. By the S. S. *Manco*, from Iquitos.

H. A. Astlett & Co.	......	......	......	......	1,9[illegible]
Meyer & Brown, Inc	......	......	......	......	1,372
Various	......	......	......	......	18,620

July 31. By the S. S. *Arna*, from Montevideo.

Neuss, Hesslein & Co.	......	......	......	......	9,918
Various	......	......	......	......	2,742

August 6. By the S. S. *Newton*, from Pará.

Paul Bertuch	......	......	26,917	......	26,917
H. A. Astlett & Co.	......	......	27,000	36,000	63,000

August 8. By the S. S. *Ben Nevis*, from Pará.

Paul Bertuch	......	......	26,917	......	26,917
Meyer & Brown, Inc.	......	1,120	73,920	1,680	76,720

August 20. By the S. S. *Manchurian Prince*, from Pará.

Paul Bertuch	......	......	13,095	......	13,095
Meyer & Brown, Inc.	......	22,400	......	......	22,400

August 20. By the S. S. *Rembrandt*, from Pará.

H. A. Astlett & Co.	6,000	......	3,000	......	9,000

PLANTATIONS.

(Figured 180 pounds to the bale or case.)

July [illegible]. By the S. S. *[illegible] Castle*, at New York.

	Shipment from	Shipped to:	Pounds.	Totals.
Edward Boustead & Co.	Singapore	New York	27,000	
L. Littlejohn & Co., Inc.	Singapore	New York	216,540	
Poel & Kelly	Singapore	New York	91,620	
Aldens' Successors, Inc.	Singapore	New York	260,720	
Fred Stern & Co.	Singapore	New York	45,540	
F. R. Henderson & Co.	Singapore	New York	231,480	
Chas. T. Wilson Co., Inc.	Singapore	New York	419,940	
Thornett & Fehr, Inc.	Singapore	New York	46,800	
William H. Stiles & Co.	Singapore	New York	122,760	
The Goodyear Tire & Rubber Co.	Singapore	Akron	641,960	
Meyer & Brown, Inc.	Singapore	New York	22,414	
Various	Singapore	New York	1,199,740	3,326,514

July 22. By the S. S. *[illegible]*, at New York.

T. D. Downing & Co.	London	New York	82,980	
Various	London	New York	178,020	261,000

July 2[illegible]. By the S. S. *[illegible]*, at New York.

Edward Boustead & Co.	Singapore	New York	257,760	
Eastern Rubber Co.	Singapore	New York	274,320	
Poel & Kelly	Singapore	New York	534,240	
Fred Stern & Co.	Singapore	New York	109,800	
Meyer & Brown, Inc.	Singapore	New York	11,221	
Various	Singapore	New York	696,200	1,883,541

July 2[illegible]. By the S. S. *[illegible] Maru*, at New York.

Fred Stern & Co.	Singapore	New York	33,600	
F. R. Henderson & Co.	Singapore	New York	130,320	
Mitsui & Co., Ltd.	Singapore	New York	80,640	
Firestone Tire & Rubber Co.	Singapore	Akron	791,280	
Various	Singapore	New York	728,100	
Various	Deli	New York	56,940	1,820,880

July 26. By the S. S. *Rangoon Maru*, at New York.

Chas. T. Wilson Co., Inc.	Colombo	New York	256,680	
Various	Colombo	New York	148,500	405,180

July 2[illegible]. By the S. S. *[illegible]*, at New York.

F. R. Henderson & Co.	Singapore	New York	149,940	
Thos. A. Desmond & Co.	Singapore	New York	216,360	
Rubber Trading Co.	Singapore	New York	172,980	
Vernon Metal & Produce Co.	Singapore	New York	28,800	
L. Littlejohn & Co., Inc.	Singapore	New York	277,740	
Balfour, Williamson & Co.	Singapore	New York	119,880	
Aldens' Successors, Inc.	Singapore	New York	20,160	
Overseas Export & Import Co.	Singapore	New York	10,080	
Meyer & Brown, Inc.	Singapore	New York	167,922	
Fred Stern & Co.	Singapore	New York	20,160	
Rubber Trading Co.	Singapore	New York	73,440	
L. Littlejohn & Co., Inc.	Singapore	New York	208,080	
The Goodyear Tire & Rubber Co.	Singapore	Akron	261,000	
Edward Maurer Co., Inc.	Singapore	New York	228,420	
Various	Singapore	New York	1,601,940	
Various	Penang	New York	188,[illegible]	
Various	Pt Sw't'nh'm	New York	204,120	
Various	Deli	New York	1,450,620	5,400,102

	Shipment from	Shipped to	Pounds.	Totals.

July [illegible]. By the S. S. *Jeseric*, at New York.

Various	Calcutta	New York	51,480	51,480

July [illegible]. By the S. S. *[illegible]*, at San Francisco.

The Goodyear Tire & Rubber Co.	Belawan	Akron	308,160	
Savage Tire Corp.	Soerabaya	San Diego	101,520	
Savage Tire Corp.	Batavia	San Diego	49,680	[illegible]

July 30. By the S. S. *[illegible]*, at New York.

G. Kuwahara Co.	Osaka	New York	[illegible]	
Pacific Trading Corp. of America	Singapore	New York	[illegible]	
Mitsui & Co., Ltd.	Singapore	New York	[illegible]	[illegible]

July 30. By the S. S. *City of Colombo*, at New York.

Meyer & Brown, Inc.	Singapore	New York	[illegible]	247,[illegible]

July 31. By the S. S. *City of Lincoln*, at New York.

Chas. T. Wilson Co., Inc.	Colombo	New York	190,620	
Baring Bros.	Colombo	New York	403,200	
Hadden & Co.	Colombo	New York	28,800	
Wm. Brandt & Sons	Colombo	New York	23,760	
Meyer & Brown, Inc.	Colombo	New York	448,000	[illegible]

July 31. By the S. S. *Virgilia*, at New York.

T. D. Downing & Co	Liverpool	New York	78,300	
Poel & Kelly	Liverpool	New York	39,420	
Various	Liverpool	New York	142,920	260,640

July 31. By the S. S. *City of Michigan*, at New York.

T. D. Downing & Co.	London	New York	92,880	92,880

July 31. By the S. S. *Vasconia*, at New York.

Fred Stern & Co.	Liverpool	New York	39,060	39,060

July 31. By the S. S. *City of [illegible]*, at New York.

Poel & Kelly	Pt Sw't'nh'm	New York	12,240	
L. Littlejohn & Co., Inc.	Pt Sw't'nh'm	New York	4,860	
Various	Pt. Sw't'nh'm	New York	229,860	
Poel & Kelly	Port Dickson	New York	11,700	
Meyer & Brown, Inc.	Penang	New York	108,000	
Rubber Trading Co.	Penang	New York	72,000	
L. Littlejohn & Co., Inc.	Penang	New York	9,900	
General Rubber Co.	Tandj'g Balei	New York	452,700	
Aldens' Successors, Inc.	Deli-Belawan	New York	122,220	
L. Littlejohn & Co., Inc.	Deli-Belawan	New York	33,480	
W. G. Ryckman, Inc.	Deli-Belawan	New York	1,980	
Firestone Tire & Rubber Co.	Deli-Belawan	Akron	61,560	
The B. F. Goodrich Co.	Singapore	Akron	598,680	
Hood Rubber Co.	Singapore	Watertown	109,080	
L. Littlejohn & Co., Inc.	Singapore	New York	240,120	
William H. Stiles & Co.	Singapore	New York	27,180	
Meyer & Brown, Inc.	Singapore	New York	347,200	
Chas. T. Wilson Co., Inc.	Singapore	New York	120,960	
A. C. Fox & Co.	Singapore	New York	132,840	
H. A. Forbes & Co.	Singapore	New York	27,000	
Thornett & Fehr, Inc.	Singapore	New York	40,320	
F. R. Henderson & Co.	Singapore	New York	279,000	
Thos. A. Desmond & Co.	Singapore	New York	40,320	
Various	Singapore	New York	1,866,480	
Poel & Kelly	Malacca	New York	22,140	
Various	Deli-Belawan	New York	36,000	5,007,820

August 1. By the S. S. *Telemachus*, at New York.

F. T. Johnstone & Co.	Singapore	New York	182,000	
Fred Stern & Co.	Singapore	New York	331,520	
H. A. Astlett & Co.	Singapore	New York	168,000	
Pacific Trading Corp. of America	Singapore	New York	99,540	
Thos. A. Desmond & Co.	Singapore	New York	12,060	
Aldens' Successors, Inc.	Singapore	New York	38,520	
Meyer & Brown, Inc.	Singapore	New York	571,1[illegible]	
Various	Kelantan	New York	20,160	
Various	Jamboanga	New York	10,800	
Various	Medan	New York	137,340	
Various	Deli	New York	918,000	
Various	Singapore	New York	4,122,080	6,111,1[illegible]

August 1. By the S. S. *Bolton Castle*, at New York.

L. Littlejohn & Co., Inc.	Singapore	New York	126,000	
The Goodyear Tire & Rubber Co.	Singapore	Akron	104,940	
Chas. T. Wilson & Co., Inc.	Singapore	New York	130,860	
A. C. Fox & Co.	Singapore	New York	45,000	
The Fisk Rubber Co.	Singapore	Chic'pee Falls	126,000	
Poel & Kelly	Singapore	New York	553,140	
Thos. A. Desmond & Co.	Singapore	New York	30,240	
Hood Rubber Co.	Singapore	Watertown	67,320	
The B. F. Goodrich Co.	Singapore	Akron	369,360	
Fred Stern & Co.	Singapore	New York	89,000	
Meyer & Brown, Inc.	Singapore	New York	190,198	
Various	Singapore	New York	1,023,360	2,855,418

August [illegible]. By the S. S. *[illegible]*, at New York.

T. D. Downing & Co.	London	New York	[illegible],260	
Various	London	New York	[illegible]	149,480

August 3. By the S. S. *Persia Maru*, at San Francisco.

Various	Hong Kong	San Fran	177,480	177,480

August 4. By the S. S. *[illegible]*, at New York.

Chas. T. Wilson Co., Inc.	Colombo	New York	[illegible]	
Vernon Metal & Produce Co.	Colombo	New York	63,[illegible]	
Various	Colombo	New York	130,1[illegible]	264,420

	Shipment from:	Shipped to:	Pounds.	Totals.
AUGUST 4. By the S. S. *Horaisan Maru*, at Seattle.				
Mitsui & Co., Ltd......	Kobe	Seattle	72,000	
Trans Oceanic Co.	Kobe	Seattle	74,340	146,340
AUGUST 5. By the S. S. *Mesaba*, at New York.				
T. D. Downing & Co....	London	New York	86,220	86,220
AUGUST 5. By the S. S. *Mattawa*, at Vancouver.				
Meyer & Brown, Inc....	Singapore	New York	134,400	134,400
AUGUST 6. By the S. S. *Gaelic Prince*, at New York.				
J. T. Johnstone & Co..	Penang	New York	6,200	
The B. F. Goodrich Co.	Penang	Chic'pee Falls	130.140	
Dunlop Tire & Rubber Goods Co., Ltd......	Singapore	Toronto	189,720	
Meyer & Brown, Inc....	Singapore	New York	750,400	
Fred Stern & Co......	Singapore	New York	501,900	
Boston Insulated Wire & Cable Co.	Singapore	Dorchester	6,300	
The Fisk Rubber Co....	Singapore	Chic'pee Falls	165,600	
Various	Singapore	New York	3,023,640	4,773,900
AUGUST 9. By the S. S. *Edinburgh*, at New York.				
Various	Colombo	New York	20,160	20,160
AUGUST 17. By the S. S. *Santa Clara*, at New York.				
Meyer & Brown, Inc...	Colombo	New York	395,360	395,360
AUGUST 18. By the S. S. *Howick Hall*, at New York.				
Meyer & Brown, Inc...	Singapore	New York	56,000	
H. A. Astlett & Co....	Singapore	New York	113,200	
Fred Stern & Co......	Singapore	New York	127,680	
J. T. Johnstone & Co., Inc.	Singapore	New York	80,640	377,520
AUGUST 19. By the S. S. *Bancric*, at New York.				
Fred Stern & Co......	Singapore	New York	22,440	22,400
AUGUST 19. By the S. S. *Alaska Maru*, at New York.				
Fred Stern & Co......	Singapore	New York	147,500	147,500
AUGUST 19. By the S. S. *Rondo*, at New York.				
Fred Stern & Co.......	Belawan Deli	New York	56,000	
United Malaysian Rubber Co.	Borneo	New York	7,000	63,000
AUGUST 20. By the S. S. *West Harts*, at San Francisco.				
Various	Hong Kong	San Fran.	198,900	198,900
AUGUST 20. By the S. S. *City of Manila*, at New York.				
Meyer & Brown, Inc...	Colombo	New York	389,760	389,760
AUGUST 20. By the S. S. *Persian Prince*, at New York.				
Meyer & Brown, Inc....	Singapore	New York	44,800	
Fred Stern & Co.......	Singapore	New York	100,800	145,600
AUGUST 21. By the S. S. *Rotterdam*, at New York.				
Meyer & Brown, Inc....	Rotterdam	New York	67,200	67,200

BALATA.

	Shipment from:	Shipped to:	Pounds.	Totals.
JULY 24. By the S. S. *Cristobal* at New York.				
Wellman Peck & Co....	Cristobal	New York	900	
Ultramares Corp.	Cristobal	New York	3,300	
Various	Cristobal	New York	150	4,350
JULY 28. By the S. S. *Mayaro*, at New York.				
Middleton & Co., Limited	Demerara	New York	9,793	9,793
AUGUST 1. By the S. S. *Aurora*, at New York.				
Wm. Schall & Co.......	Cape Haytien	New York	6,150	6,150
AUGUST 1. By the S. S. *Philadelphia*, at New York.				
Various	Southampton	New York	27,900	27,900
AUGUST 3. By the S. S. *Aurora*, at New York.				
William Schall & Co....	Dutch Guiana	New York	25,677	25,677
AUGUST 9. By the S. S. *Carrillo*, at New York.				
Ultramares Corp.	Kingston	New York	9,750	
G. Amsinck & Co., Inc..	Kingston	New York	4,050	13,800
AUGUST 9. By the S. S. *Colon*, at New York.				
Isaac Brandon & Bros..	Cristobal	New York	450	
American Trading Co...	Cristobal	New York	2,400	2,950
AUGUST 9. By the S. S. *Allianca*, at New York.				
Various	Cristobal	New York	3,450	3,450

CENTRALS.

	Shipment from:	Shipped to:	Pounds.	Totals.
JULY 24. By the S. S. *Cristobal*, at New York.				
American Trading Co...	Cristobal	New York	5,550	
G. Amsinck & Co., Inc..	Cristobal	New York	5,250	
Chas. B. Griffin........	Cristobal	New York	16,200	
Wellman, Peck & Co...	Cristobal	New York	7,800	
Ultramares Corp.	Cristobal	New York	5,700	
A. M. Capen's Sons, Inc.	Cristobal	New York	2,550	43,050
AUGUST 2. By the S. S. *Lake Faunier*, at New York.				
Ultramares Corp.	Cartegena	New York	3,900	3,900
AUGUST 9. By the S. S. *Allianca*, at New York.				
Cowdry & Co..........	Cristobal	New York	9,750	
Various	Cristobal	New York	1,950	11,700

AFRICANS.

	Shipment from:	Shipped to:	Pounds.	Totals.
JULY 22. By the S. S. *Farnworth*, at New York.				
Various	Bordeaux	New York	25,415	25,415
AUGUST 9. By the S. S *Kroonland*, at New York.				
Various	Antwerp	New York	25,185	25,185
AUGUST 15. By the S. S. *Coronia*, at New York.				
Meyer & Brown, Inc....	Liverpool	New York	11,200	11,200

PONTIANAK.

	Shipment from:	Shipped to:	Pounds.	Totals.
JULY 22. By the S. S. *Muncaster Castle*, at New York.				
Baring Bros.	Singapore	New York	65,700	
L. Littlejohn & Co., Inc.	Singapore	New York	307,800	
Various	Singapore	New York	29,700	403,200
JULY 23. By the S. S. *Suveric*, at New York.				
United Malaysian Rubber Co., Limited......	Singapore	New York	267,300	
Various	Singapore	New York	257,400	524,700
JULY 26. By the S. S. *Amur Maru*, at New York.				
Baring Brothers	Singapore	New York	105,000	
Various	Singapore	New York	1,500	106.500
JULY 31. By the S. S. *City of Colombo*, at New York.				
Fred Stern & Co........	Colombo	New York	52,800	
The United Malaysian Rubber Co., Limited..	Singapore	New York	183,680	
Various	Colombo	New York	354,500	590,980
AUGUST 1. By the S. S. *Bolton Castle*, at New York.				
The Goodyear Tire & Rubber Co.	Singapore	Akron	3,900	
F. R. Henderson & Co..	Singapore	New York	3,000	
Various	Singapore	New York	867,900	874,800
AUGUST 6. By the S. S. *Gaelic Prince*, at New York.				
The United Malaysian Rubber Co., Limited..	Singapore	New York	852,689	
Various	Singapore	New York	115,500	968,189
AUGUST 19. By the S. S. *Alaska Maru*, at New York.				
The United Malaysian Rubber Co., Limited..	Singapore	New York	762,849	762,849
AUGUST 23. By the S. S. *Persian Prince*, at New York.				
The United Malaysian Rubber Co., Limited..	Singapore	New York	92,068	92,068

GUAYULE.

	Shipment from:	Shipped to:	Pounds.	Totals.
JULY 31. By the S. S. *Ocmulga*, at New York.				
Various	Mexican Ports	New York	2,250	2,250
AUGUST 4. By rail at Eagle Pass, Texas.				
Continental - Mexican Rubber Co............	Mexico	New York	60,390	
Continental - Mexican Rubber Co............	Mexico	Akron	66,000	126,390
AUGUST 4. By rail, at Laredo, Tex.				
Continental - Mexican Rubber Co............	Mexico	New York	79,000	79,000
AUGUST 10. By rail at Eagle Pass, Texas.				
Continental - Mexican Rubber Co............	Mexico	Various	52,000	52,000
AUGUST 16. By rail, at Eagle Pass, Tex.				
Continental - Mexican Rubber Co............	Mexico	Various	70,000	70,000

MANIÇOBAS.

	Shipment from:	Shipped to:	Pounds.	Totals.
JULY 30. By the S. S. *Lake Silicusun*, at New York.				
J. H. Rossbach & Bros.	Brazil	New York	18,040	18,040

GUTTA PERCHA.

	Shipment from:	Shipped to:	Pounds.	Totals.
JULY 22. By the S. S. *Muncaster Castle*, at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	111,600	111,600
JULY 23. By the S. S. *Suveric*, at New York.				
Fred Stern & Co.......	Singapore	New York	37,800	37,800
JULY 31. By the S. S. *City of Colombo*, at New York.				
Various	Colombo	New York	12,000	12,000
AUGUST 1. By the S. S. *Bolton Castle*, at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	44,100	
Various	Singapore	New York	59,700	103,800

GUTTA SIAK.

	Shipment from:	Shipped to:	Pounds.	Totals.
JULY 22. By the S. S. *Muncaster Castle*, at New York.				
Various	Singapore	New York	77,100	77,100
JULY 30. By the S. S. *City of Colombo*, at New York.				
Fred Stern & Co.......	Singapore	New York	11,200	11,200
AUGUST 1. By the S. S. *Bolton Castle*, at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	25,800	25,800
AUGUST 6. By the S. S. *Gaelic Prince*, at New York.				
Various	Singapore	New York	102,900	102,900
AUGUST 19. By the S. S. *Alaska Maru*, at New York.				
The United Malaysian Rubber Co., Limited..	Singapore	New York	134,400	134,400

CUSTOM HOUSE STATISTICS.

PORT OF NEW YORK.

IMPORTS.

	June 1919 Pounds.	June 1919 Value.	June 1920 Pounds.	June 1920 Value.
UNMANUFACTURED—*free*:				
Crude rubber:				
From Belgium	......	......	75,335	$29,674
France	......	......	275,975	80,334
Netherlands	......	......	1,928,772	904,276
Portugal	..	......	598,664	123,667
Spain	......	......	165	41
England	3,209,644	$1,433,961	5,408,155	2,354,919
Canada	......	......	777	389
Costa Rica	1,070	764	1,613	639
Guatemala	3,185	791	902	226
Trinidad	......	......	83	33
Nicaragua	11,808	3,151	12,366	3,389
Panama	23,917	11,214	450	135
Salvador	16,019	10,888	......	......
Mexico	132,276	30,424	20,357	13,025
Bolivia	77,881	35,448	4,132	2,193
Brazil	3,138,771	854,559	2,264,845	631,506
Colombia	37,991	14,682	82,875	24,136
Ecuador	4,490	1,795	23,082	6,656
Peru	87,934	30,046	......	......
Venezuela	10,867	5,642	2,861	1,743
British India	1,743,003	819,382	391,826	182,582
Dutch Guiana	......	......	12,048	8,189
Straits Settlements	13,566,201	5,506,868	14,348,557	6,509,587
British E. Indies	3,946,968	1,775,282	4,367,387	2,096,661
Dutch E. Indies.	2,470,450	1,003,760	5,778,264	2,644,246
China	......	......	100,800	40,344
Japan	66,752	30,605	......	......
Philippines	......	......	42,959	14,250
British W. Africa	107,126	16,286	......	......
Australia	......	......	900	465
Totals	28,656,353	$11,585,548	35,744,150	$15,673,305
Jelutong (Pontianak):				
From Netherlands	......	......	223,900	$18,806
Straits Settlements	940,510	$98,686	749,937	165,034
Dutch E. Indies.	1,243,232	190,559	228,259	19,273
Totals	2,183,742	$289,245	1,202,096	$203,113
Gutta percha:				
From France	44,800	$9,311	......	......
England	83,473	18,793	......	......
Straits Settlements	377,162	63,242	442,777	$91,722
Dutch E. Indies.	102,674	10,678	203,103	28,829
Totals	608,109	$102,024	645,880	$120,551
Balata:				
From England	22,790	$18,232	7,778	$6,720
Panama	22,060	6,601	9,835	4,111
Brazil	......	......	4,222	3,589
Colombia	13,620	6,001	19,532	7,478
British Guiana	18,806	16,017	24,215	16,393
Dutch Guiana	415	303	45,898	32,130
French Guiana	......	......	22,711	13,336
Venezuela	12,067	7,685	7,492	4,504
Totals	89,758	$54,839	141,683	$88,261
Reclaimed and scrap rubber	497,750	38,264	669,182	36,883
Totals, unmanufactured	32,035,712	$12,069,920	38,402,991	$16,122,113
Manufactures of rubber and gutta percha	......	48,288	......	104,856
Rubber substitutes *dutiable*	12,134	2,102	25	24
Chicle ... *dutiable*	250,108	66,898	201,321	110,715

EXPORTS OF DOMESTIC MERCHANDISE.

	June 1919 Pounds.	June 1919 Value.	June 1920 Pounds.	June 1920 Value.
MANUFACTURED:				
Automobile tires	....	$2,202,734	......	$2,138,814
Inner tubes	....		......	228,805
Solid tires	......		......	127,466
All other tires	......	223,912	......	36,106
Belting	......	401,263	......	176,974
Hose	......		......	113,784
Packing	......		......	50,485
Rubber boots ... *pairs*	15,260	33,933	7,027	26,882
Rubber shoes ... *pairs*	415,357	313,046	368,038	366,677
Soles and heels	......	..	......	47,999
Druggists' sundries	......	109,602	......	86,110
Other mfrs. of rubber	......	504,420	......	443,726
Totals, manufactured	......	$3,788,910	......	$3,853,828
Insulated wire	......	$1,364,992	......	$423,154
Fountain pens .. *number*	40,738	51,672	43,632	41,103
Suspenders and garters.	......	262,505	......	375,536
Chewing gum	......	213,601	......	97,978
UNMANUFACTURED—*free*:				
Reclaimed and scrap rubber	354,895	54,311	321,663	39,235

FOREIGN EXPORTS.

	June 1919 Pounds.	June 1919 Value.	June 1920 Pounds.	June 1920 Value.
Crude rubber	35,533	$16,480	125,183	$55,863
Balata	22,335	15,155	9,214	4,509
Rubber manufactures	......	......	......	324

PORT OF BOSTON.

IMPORTS.

	June 1919 Pounds.	June 1919 Value.	June 1920 Pounds.	June 1920 Value.
UNMANUFACTURED—*free*:				
Crude rubber:				
From England	78,376	$32,342	252,220	$79,132
Canada	14,239	6,835	......	......
Straits Settlements	123,343	55,004	......	......
British East Indies	37,052	10,007	108,540	35,835
Totals	253,010	$104,188	360,760	$114,967
Gutta percha	......	......	......	......
Rubber scrap and reclaimed	16,661	1,215	28,592	2,110
Rubber manufactures...*dutiable*	......	1,1[illegible]8	......	6,498

EXPORTS.

	June 1919 Pounds.	June 1919 Value.	June 1920 Pounds.	June 1920 Value.
MANUFACTURED:				
Automobile tires	......	$3,711	......	$2,494
Inner tubes	......		......	253
Solid tires	......		......	109
Belting	......	3,617	......	6,112
Hose	......	......	......	1,408
Packing	......	......	......	290
Rubber boots	29,578	36,847	3,160	11,182
Rubber heels	53,607	30,284	324,660	287,344
Soles and heels	......	....	......	3,676
Druggists' sundries	......	2,292	......	7,546
Other rubber manufactures	......	56,878	......	38,8[illegible]8
Totals	......	$133,629	......	$359,242
Insulated wire	......	$8,084	......	$113,339
Fountain pens	......	......	......	8
Suspenders and garters	......	19,557	....	29,623
Rubber scrap	40,307	3,825	149,435	13,538

PORT OF NEW ORLEANS.

IMPORTS.

	June 1919 Pounds.	June 1919 Value.	June 1920 Pounds.	June 1920 Value.
UNMANUFACTURED—*free*:				
Chicle	......	......	3,267	$2,641

EXPORTS.

	June 1919 Pounds.	June 1919 Value.	June 1920 Pounds.	June 1920 Value.
MANUFACTURED:				
Automobile tires	......	$2,739	......	$45,144
Inner tubes	......	......	......	16,690
Solid tires	......	......	......	3,572
All other tires	......	197	......	1,697
Belting	......	6,161	......	2,187
Hose	......	......	......	5,322
Packing	......	......	......	1,203
Rubber boots ... *pairs*	72	61	770	306
Rubber shoes ... *pairs*	15,207	10,648	22,759	24,756
Soles and heels	......	......	......	1,088
Druggists' sundries	......	1,296	......	84
Other rubber manufactures	......	1,006	......	6,624
Totals	......	$22,108	......	$108,673
Insulated wire	......	$3,853	......	$10,992
Fountain pens	68	197	60	93
Suspenders	......	4,646	....	23,178
Chewing gum	......	2,182	....	4,434

REEXPORTS.

	June 1919 Pounds.	June 1919 Value.	June 1920 Pounds.	June 1920 Value.
Chicle	......	$2,106	....	......

PORT OF SEATTLE.

IMPORTS.

	June 1919 Pounds.	June 1919 Value.	June 1920 Pounds.	June 1920 Value.
UNMANUFACTURED—*free*:				
Crude rubber:				
From Canada	920	$314	307,004	$318,422
Straits Settlements	1,388,873	597,430	1,119,661	580,705
British East Indies	82,880	31,152	154,140	161,840
Dutch East Indies	63,350	28,508	......	......
Hongkong	......	......	160	64
Japan	169,225	68,460	......	......
Totals	1,705,248	$725,864	1,580,965	$1,061,031
Jelutong	112,669	12,667	......	......
Rubber scrap	......	......	144,000	24,697
Gutta percha	200	40	......	....
Rubber manufactures	......	250	......	46

EXPORTS.

	June 1919 Pounds.	June 1919 Value.	June 1920 Pounds.	June 1920 Value.
MANUFACTURED:				
Automobile tires	......	$337,531	......	$136,180
Inner tubes	......	......	......	18,446
Solid tires	......	......	......	1,417
All other tires	......	3,379	......	13,856
Belting	......	1,725	......	3,328
Hose	......	......	......	1,647
Packing	......	......	......	338
Rubber boots ... *pairs*	1,014	1,912	626	3,767
Rubber shoes ... *pairs*	2,246	2,281	131	137
Soles and heels	......	......	......	4,2[illegible]
Druggists' sundries	......	2,504	......	561
Other rubber manufactures	......	9,370	......	2,337
Totals	......	$358,702	......	$1[illegible]5,8[illegible]
Insulated wire	......	$2,762	......	$2,337
Fountain pens ... *number*	..	....	456	257
Suspenders	......	5,547	.. ..	213
Chewing gum	......	[illegible]	....	[illegible]
Reclaimed rubber	40,637	1,532	63,044	2,571

PORT OF SAN FRANCISCO.

IMPORTS.

	June 1919 Pounds.	June 1919 Value.	June 1920 Pounds.	June 1920 Value.
UNMANUFACTURED—*free*:				
Crude rubber:				
From Straits Settlements	2,953,494	$1,070,386	1,650,023	$791,134
China	1,122	857	......	......
Dutch East Indies	918,140	300,221	204	80
Hong Kong	858	317		
Totals	3,873,614	$1,371,781	1,650,227	$791,214
Jelutong	57,000	$3,437	......	......
Rubber scrap and reclaimed.	9,146	326	......	......
Rubber manufactures	......	196	......	$622

PORT OF SAN FRANCISCO—Continued.

EXPORTS.

	June. 1919. Pounds.	June. 1919. Value.	June. 1920. Pounds.	June. 1920. Value.
MANUFACTURED				
Automobile tires	......	$334,433	......	$305,613
Inner tubes	......	......	......	65,064
Solid tires	......	......	......	18,721
All other tires	......	7,997	......	8,248
Belting	......	81,465	......	67,493
Hose	......	......	......	35,191
Packing	......	......	......	25,705
Rubber boots ....pairs	852	2,043	68	337
Rubber shoes ....pairs	5,231	8,284	9,427	8,871
Soles and heels	......	......	......	6,568
Druggists' sundries	......	6,598	......	1,752
Other rubber manufactures	......	99,381	......	15,003
Totals	......	$540,141	......	$558,566
Insulated wire	......	$8,649	......	$14,424
Fountain pens .....number	180	452	252	690
Suspenders	......	6,564	......	1,734
Chewing gum	......	8,616	......	10,702
UNMANUFACTURED—free				
Reclaimed and scrap rubber.	3,500	375	74,067	2,667

UNITED KINGDOM RUBBER STATISTICS.

IMPORTS.

	June. 1919. Pounds.	June. 1919. Value.	June. 1920. Pounds.	June. 1920. Value.
UNMANUFACTURED				
Crude rubber:				
From—				
Straits Settlements	5,494,400	£574,949	5,559,800	£609,286
Federated Malay States	5,683,900	553,003	6,293,700	708,308
British India	661,300	62,933	1,703,600	191,797
Ceylon and dependencies	3,208,500	324,497	2,597,500	283,437
Other Dutch possessions in Indian seas	1,389,600	135,273	1,084,900	122,756
Dutch East Indies (except other Dutch possessions in Indian seas)	3,350,900	323,088	2,571,600	289,365
Other countries in the East Indies and Pacific not elsewhere specified	136,900	14,220	234,000	26,223
Brazil	1,248,800	128,582	2,025,000	195,242
Peru	235,200	21,000	160,000	15,200
South and Central America (except Brazil and Peru)	1,900	170	47,900	5,011
West Africa:				
French West Africa	26,866	1,988	3,400	230
Gold Coast	47,700	3,711	15,900	1,726
Other parts of West Africa	61,100	6,181	163,200	24,989
East Africa (including Madagascar)	5,800	610	94,700	9,547
Other countries	194,300	18,427	293,500	25,632
Totals	21,747,100	£2,168,632	22,848,700	£2,508,749
Waste and reclaimed rubber	606,400	12,095	907,100	14,343
Totals, unmanufactured	22,353,500	£2,180,727	23,755,800	£2,523,092
Gutta percha and balata	516,800	111,262	1,482,000	333,677
Rubber substitutes	....	....	58,200	2,040
MANUFACTURED—				
Boots and shoes..dozen pairs	3,391	£5,477	47,584	£99,607
Waterproof clothing	.....	275	....	611
Tires and tubes	.....	109,366	....	500,220
Other rubber manufactures	.....	45,389	....	47,726
Insulated wire	.....	....	....	182

EXPORTS.

	June. 1919. Pounds.	June. 1919. Value.	June. 1920. Pounds.	June. 1920. Value.
UNMANUFACTURED				
Waste and reclaimed rubber	1,610,200	£24,465	1,338,600	£35,063
*Rubber substitutes	....	....	168,100	9,225
Totals	1,610,200	£24,465	1,506,700	£44,288
MANUFACTURED				
Boots and shoes..dozen pairs	11,747	£23,634	7,655	£17,194
Waterproof clothing	....	108,285	......	216,359
Insulated wire	....	96,028	......	140,762
Submarine cables	..	38,990	......	416,853
Tires and tubes	.....	402,568	....	671,187
Other rubber manufactures	.....	247,155	......	441,224
Totals	....	£916,660	......	£1,903,579

EXPORTS—COLONIAL AND FOREIGN.

	June. 1919. Pounds.	June. 1919. Value.	June. 1920. Pounds.	June. 1920. Value.
UNMANUFACTURED				
Crude rubber:				
To Russia	*27,300	£4,060	10,300	£1,000
Sweden, Norway and Denmark	[illegible]	153,180	413,900	39,375
Germany	214,000	23,880	1,078,900	102,999
Belgium	757,700	67,334	516,000	63,104
France	2,255,700	246,093	2,842,900	310,716
Spain	71,000	8,260	45,400	4,744
Italy	1,137,000	123,953	370,500	38,834
Austria Hungary	.	.....	10,800	132,800
Other European countries	1,293,200	139,356	607,200	59,766
United States	1,164,700	109,830	5,021,600	574,185
Canada	367,500	46,916	1,478,400	167,076
Other countries	35,600	4,403	286,300	32,375
Totals, rubber	8,596,400	£927,265	12,682,200	£1,526,974
Waste and reclaimed rubber.	71,900	£3,340	17,900	£1,190
Gutta percha and balata	79,000	12,234	109,900	19,270
Rubber substitutes	....	....	6,900	160

	June. 1919. Pounds.	June. 1919. Value.	June. 1920. Pounds.	June. 1920. Value.
MANUFACTURED				
Boots and shoes . dozen pairs	76	192	793	4,636
Waterproofed clothing	....	....	....	16
Tires and tubes	....	13,022	....	40,376
Insulated wire	....	27	....	....
Other manufactures	....	5,216	....	2,006
Totals, manufactured	....	£18,457	....	£47,034

*Included in "Other Articles," Class III and I, prior to 1920.

RUBBER STATISTICS FOR THE DOMINION OF CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	April. 1919. Pounds.	April. 1919. Value.	April. 1920. Pounds.	April. 1920. Value.
UNMANUFACTURED—free				
Rubber, gutta percha, etc.:				
From United Kingdom	69,454	$20,053	403,302	$256,326
United States	307,854	131,662	232,178	96,446
Belgian Congo	13,036	5,589	....	....
Brazil	....	....	73,650	39,013
British East Indies:				
Ceylon	44,709	16,095	33,600	22,468
India	....	......	5,300	1,974
Straits Settlements	509,277	202,392	852,845	478,980
Other countries	......	....	15,616	9,641
Totals	944,330	$375,791	1,616,491	$904,848
Balata	19	$28	....	....
Rubber recovered	214,763	35,074	235,617	$37,656
Rubber, powdered, and rubber or gutta percha scrap	183,562	20,051	200,831	7,355
Rubber substitutes	160,866	15,456	153,970	21,244
Totals unmanufactured	1,503,540	$446,400	2,206,909	$971,103
PARTLY MANUFACTURED—				
Hard rubber sheets and rods	6,254	$4,057	4,952	$2,878
Hard rubber tubes	....	2,124	....	1,859
Rubber thread, not covered	940	1,402	4,240	6,373
Totals, partly manufactured	7,194	$7,583	9,192	$11,110
MANUFACTURED—				
Belting	......	$11,734	....	$16,275
Hose	...	7,746	....	6,243
Packing	.....	5,085	....	7,131
Boots and shoes	...	13,813	....	59,178
Clothing, including waterproofed	....	15,851	....	25,061
Gloves	.....	2,160	....	549
Hot water bottles	......	4,406	....	2,496
Tires, solid	.....	12,234	.....	20,835
Tires, pneumatic	.	66,251	......	149,214
Tires, inner tubes	....	8,979	....	7,532
Other manufactures	.	157,277	....	279,071
Totals, manufactured	.....	$305,536	....	$573,585
Totals, rubber imports	.....	$1,135,310	....	$2,460,646
Insulated wire and cables:				
Wire and cables covered with cotton, linen, silk, rubber, etc.	...	$14,600	.....	$11,078
Copper wire and cables, covered as above	.....	5,677	....	11,981
Chicle	262,268	172,950	....	....

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	April. 1919. Produce of Canada. Value.	April. 1919. Reexports of Foreign Goods. Value.	April. 1920. Produce of Canada. Value.	April. 1920. Reexports of Foreign Goods. Value.
UNMANUFACTURED—				
Crude and waste rubber	$187,586	$127,618	$4,828	$16,765
MANUFACTURED—				
Belting	[illegible]	$34	$947	$2,017
Hose	.	3,514	......	4,786
Boots and shoes	....	59,994	....	115,529
Clothing, including waterproofed	....	7,159	....	930
Tires, pneumatic		331,409	....	939,752
Tires, other kinds	.	1,877	.....	440
Other manufactures	.	9,843	......	29,662
Totals, manufactured	$28	$413,830	$947	$1,093,116
Total rubber exports	$187,614	$541,448	$5,775	$1,109,881
Chicle	$29,412	$36,473	....	......

RUBBER STATISTICS FOR ITALY.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	January. 1919. Quintals.[1]	Lire.[2]	1920. Quintals.	Lire.
UNMANUFACTURED				
Crude rubber and gutta percha raw and reclaimed.				
From British India and Ceylon	501	2,367,750	490	1,431,150
Straits Settlements	668		....	
French African Colonies	754		152	
Brazil	235		309	
Other countries	97		412	
Totals	2,255	2,367,750	1,363	1,431,150
Rubber scrap	.....	....	11	1,980
Totals, unmanufactured	2,255	2,367,750	1,374	1,433,130
MANUFACTURED—				
India rubber and gutta percha—				
Threads	.....	....	13	33,800
Sheets, including hard rubber	71	113,600	1	700
Tubes	17	20,400	1	1,300
Belting	43	60,200	56	78,400
Rubber-coated fabrics......*pieces*	23	36,800	14	22,000
Boots and shoes......*pairs*	111	1,665	13,030	195,450
Elastic webbing	.....	....	3	8,400
Clothing and articles for travel	.....	....	8	25,600
Tires and tubes.				
From France	490	1,176,000	2	1,092,000
Great Britain	.....		302	
Other countries	.....		151	
Other manufactures	2,541	3,717,300	275	404,700
Totals, manufactured	.....	5,225,965	....	1,865,150
Total imports	.....	7,593,715	....	3,298,280

EXPORTS OF CRUDE AND MANUFACTURED RUBBER.

	January. 1919. Quintals.	Lire.	1920. Quintals.	Lire.
UNMANUFACTURED				
India rubber and gutta percha, raw and reclaimed				
To Spain	1,632	652,800	...	98,000
United States	...		245	
Totals	1,632	652,800	245	98,000
Waste	..	.....	180	21,600
Totals	1,632	652,800	245	[illegible]
MANUFACTURED				
India rubber and gutta percha				
Threads	25	67,500	50	135,000
Sheets, including hard rubber	3	4,200	50	63,600
Tubes	73	84,800	54	59,500
Belting	76	121,600	....	....
Rubberized fabrics........*pieces*	.	...	9	10,800
Elastic webbing	84	252,000	28	84,000
Clothing and articles for travel	.....	.....	139	667,200
Tires:				
To Austria	.....	1,837,300	9	174,800
Belgium	214		3	
France	31		....	
Great Britain	121		....	
Spain	..		4	
Switzerland	1		69	
Australia	241		....	
Argentine	171		....	
Brazil	175		1	
Other countries	13		6	
Totals	967	1,837,300	92	174,800
Other rubber goods	125	176,400	213	310,600
Totals, manufactured	.....	2,543,800	....	1,505,500
Total exports	.....	3,196,600	....	1,625,100

[1]One quintal equals 220.46 pounds.
[2]One lira equals $0.193 (normal).

EXPORTS OF INDIA RUBBER AND CAUCHO FROM MANAOS FOR SIX MONTHS ENDED JUNE 30, 1920.

EXPORTERS.	EUROPE. Fine.	Medium.	Coarse.	Caucho.	TOTALS.	NEW YORK. Fine.	Medium.	Coarse.	Caucho.	TOTALS.	GRAND TOTALS.
Tancredo, Porto & Co.....*kilos.*	843,599	49,187	82,246	77,121	1,052,153	289,376	132,222	269,237	648,061	1,338,896	2,391,049
General Rubber Co. of Brazil...	713,935	66,071	45,211	13,403	838,620	596,402	104,184	178,189	385,755	1,264,530	2,103,150
Stowell & Co.	387,458	49,541	51,337	119,793	608,129	198,057	98,769	168,193	212,738	677,757	1,285,886
Ohliger & Co.	203,932	....	....	....	203,932	320,311	49,732	50,865	321,774	742,682	946,614
Adelbert H. Alden, Limited....	167,638	6,758	1,121	579	176,096	340	5,041	35,160	14,110	54,651	230,747
A. Souza	....	....	....	....	....	2,914	245	97,616	58,569	159,344	159,344
J. A. Mendes & Co.	71,075	98	....	....	71,173	....	13,692	20,225	50,165	84,082	155,255
Higson & Fall	28,768	3,602	3,495	3,281	39,146	36,896	3,707	2,677	42,720	85,994	125,140
B. Lévy & Co.	47,498	6,077	53,244	....	106,819	....	....	....	....	....	106,819
Morães, Carneiro & Co.	14,436	2,291	2,228	2,198	21,153	32,086	4,798	1,965	....	38,849	60,002
Amorim Irmãos	20,000	....	....	....	20,000	6,240	8,575	14,608	574	29,997	49,997
Semper & Co.	29,541	4,038	4,422	....	38,001	3,345	640	1,080	420	5,485	43,486
J. G. Araujo	17,523	6,311	4,298	8,644	36,776	....	....	....	....	....	36,776
Gomes & Co.	23,290	320	600	....	24,210	....	....	....	....	....	24,210
G. Deffner & Co.	....	....	....	....	....	9,333	.....	2,245	3,156	14,734	14,734
J. Essabbá	13,100	533	302	....	13,935	....	....	....	....	....	13,935
Madeira-Mamoré Railway Co....	9,500	....	....	....	9,500	....	....	....	....	....	9,500
Th. Lévy, Camille & Co. / Paulo Lévy & Co.	3,220	320	2,989	52	6,581	....	....	....	....	....	6,581
Oscar Ramos	3,530	....	2,550	425	6,505	....	....	....	....	....	6,505
Archer Pinto & Co.	....	....	....	....	....	1,571	116	1,327	46	3,060	3,060
Vianna Lyra & Co.	....	....	....	....	....	960	....	....	....	960	960
Corréa & Irmãos	....	....	....	....	....	100	....	....	....	100	100
	2,598,043	195,147	254,043	225,496	3,272,729	1,497,925	421,721	843,387	1,738,088	4,501,121	7,773,850
In transit, Iquitos	10,158	3,660	2,391	2,752	18,961	160,557	465,881	77,881	266,072	970,391	989,352
Totals ....*kilos*	2,608,201	198,807	256,434	228,248	3,291,690	1,658,482	887,602	921,268	2,004,160	5,471,512	8,763,202

(*Compiled by Stowell & Co., Manáos, Brazil.*)

EXPORTS OF INDIA RUBBER FROM MANAOS DURING JUNE, 1920.

EXPORTERS.	EUROPE Fine.	Medium.	Coarse.	Caucho.	TOTALS.	NEW YORK Fine.	Medium.	Coarse.	Caucho.	TOTALS.	GRAND TOTALS.
General Rubber Co. of Brazil..*kilos*	317,000	26,000	15,827	173	359,000	100,754	24,746	27,500	123,350	276,350	635,350
Stowell & Co.	107,450	28,508	11,989	54,311	202,258	....	16,729	5,584	97,514	119,827	322,085
Tancredo, Porto & Co.	6,120	2,720	7,611	3,520	19,971	88,681	16,129	15,316	86,826	206,952	226,923
Ohliger & Co.	....	....	....	....	....	26,750	1,573	2,042	39,293	69,658	69,658
Higson & Fall	....	....	....	....	....	21,485	1,595	435	28,870	52,385	52,385
Y. G. Araujo	1,970	4,409	1,863	7,867	16,109	....	....	....	....	....	16,109
Moraes, Carneiro & Co.	2,132	534	939	1,440	5,045	....	....	....	....	....	5,045
Amorim Irmãos	....	....	....	....	....	2,080	....	2,880	....	4,960	4,960
	434,672	62,171	38,229	67,311	602,383	239,750	60,772	53,757	375,853	730,132	1,332,515
In transit, Iquitos	....	1,358	....	....	1,358	8,455	28,697	2,776	41,226	81,154	82,512
Totals ....*kilos*	434,672	63,529	38,229	67,311	603,741	248,205	89,469	56,533	417,079	811,286	1,415,027

(*Compiled by Stowell & Co., Manáos, Brazil.*)

EXPORTS OF INDIA RUBBER MANUFACTURES FROM THE UNITED STATES BY COUNTRIES DURING THE CALENDAR YEAR 1919.

EXPORTED TO—	Scrap and Old.		Reclaimed.		Belting, Hose and Packing.	Boots.		Shoes.		Druggists' Rubber Sundries.	Automobile Tires.		All other Manufactures of Rubber	Totals.
	Pounds	Dollars	Pounds.	Value.	Value.	Pairs.	Value.	Pairs.	Value.	Value.	Casings Value.	All other. Value.	Value.	Value.
EUROPE:														
Austria-Hungary	......	......	......	......	$5,828	......	......	......	......	$9	$43,121	$94	$49,994	$99,046
Azores and Madeira Islands	......	......	......	......	......	......	......	222	$284	......	......	......	118	402
Belgium	88,580	$13,130	13,468	$2,400	7,976	112	$215	26,308	17,826	3,451	532,532	143,020	64,813	785,363
Denmark	129,600	22,090	......	......	50,669	10,076	22,322	500,219	346,849	20,547	1,254,324	54,492	173,646	1,944,939
Finland	......	......	......	......	52,120	......	......	73,852	62,413	300	23,367	......	2,389	140,589
France	603,099	100,015	180,570	26,574	82,222	124	310	75,281	52,339	45,581	3,535,178	128,990	1,159,438	5,130,647
Germany	201,000	29,204	......	......	2,307	1	4	1,007	1,013	1,200	33,280	27	11,746	78,781
Gibraltar	......	......	......	......	......	96	335	1,464	1,386	......	175	90	130	2,116
Greece	......	......	......	......	1,344	201	1,805	3,028	3,177	1,561	83,449	37	16,922	108,295
Iceland and Faroe Islands	......	......	......	......	509	11,027	25,560	27,689	23,335	3,508	23,961	1,653	7,140	85,666
Italy	22,400	3,136	11,375	1,916	11,165	480	1,352	55,626	54,688	8,579	226,245	18	43,818	350,917
Malta, Gozo and Cyprus Islands	......	......	......	......	......	22	59	......	......	14	424	......	1,197	1,694
Netherlands	1,283,640	127,062	127,915	25,900	74,633	......	......	60,923	51,018	11,598	1,043,981	136,640	126,064	1,596,896
Norway	40,000	2,500	......	......	113,755	8,338	19,731	951,146	728,810	14,021	845,690	78,279	121,659	1,924,445
Portugal	......	......	......	......	7,491	13	83	7,164	6,932	1,367	176,303	12,300	5,590	210,066
Roumania	......	......	......	......	10,062	......	......	19,577	27,279	850	70,785	2,580	1,634	113,190
Russia in Europe	......	......	......	......	8,400	2	12	15,270	17,637	......	1,402	......	1,107	28,558
Serbia, Montenegro, etc.	......	......	......	......	......	......	......	......	......	......	300	......	......	300
Spain	27,202	3,220	......	......	16,378	216	882	41,912	27,672	16,565	825,007	7,759	92,982	990,465
Sweden	188,640	31,150	143,858	23,837	198,058	264	2,000	258,566	169,843	19,355	1,373,847	58,468	116,114	1,992,672
Switzerland	......	......	......	......	6,632	720	1,060	195,640	123,394	13,638	230,052	620	86,965	452,361
Turkey in Europe	......	......	......	......	1,017	......	......	427,887	346,777	1,028	85,334	1,175	600	435,931
England	1,488,874	189,422	321,504	53,906	480,621	27,239	48,391	1,046,264	640,056	176,918	1,508,460	120,909	1,499,693	4,718,376
Scotland	447,981	42,988	448,000	73,297	13,525	......	......	6,700	4,983	949	263	......	5,669	141,674
Ireland	......	......	......	......	......	......	......	878	241	......	......	......	2,209	2,450
TOTALS, EUROPE	4,521,016	$563,917	1,246,690	$207,830	$1,144,712	58,931	$124,121	3,796,623	$2,707,952	$341,039	$11,907,480	$747,151	$3,591,637	$21,335,839
NORTH AMERICA:														
Bermuda	......	......	......	......	$1,772	140	$455	2,239	$2,183	$1,248	$268	$901	$2,500	$9,327
British Honduras	......	......	......	......	1,780	......	......	12,861	13,613	435	6,663	414	1,294	24,199
Canada	2,316,488	$178,578	3,750,138	$619,524	441,730	56,177	182,757	131,222	146,824	275,713	1,021,014	57,262	2,157,484	5,080,886
Costa Rica	......	......	......	......	8,540	......	......	60	69	1,925	12,301	1,343	6,083	30,861
Guatemala	......	......	......	......	15,665	83	112	2,939	2,990	5,132	64,981	3,963	13,639	106,482
Honduras	......	......	......	......	13,263	315	976	4,107	4,857	2,639	35,489	3,646	4,613	65,483
Nicaragua	......	......	......	......	13,846	52	340	2,267	2,140	4,100	32,075	335	24,858	77,694
Panama	321	71	......	......	99,646	470	2,046	16,434	17,983	9,019	416,637	24,361	40,264	610,027
Salvador	......	......	......	......	9,732	......	......	195	134	2,190	95,664	5,528	40,436	153,684
Mexico	500	35	......	......	704,460	414	1,860	36,101	33,616	103,519	805,614	62,543	259,397	1,971,044
Miquelon, Langley, etc.	......	......	......	......	179	9,136	26,290	1,042	883	......	......	6	652	28,010
Newfoundland and Labrador	......	......	......	......	26,292	70,827	203,470	89,026	87,190	2,026	24,319	1,213	43,399	387,909
Barbados	......	......	......	......	1,546	42	83	1,661	1,662	1,388	31,026	4,442	2,058	42,205
Jamaica	......	......	......	......	8,853	......	......	12,306	14,855	2,627	156,822	2,781	12,824	198,762
Trinidad and Tobago	......	......	......	......	12,067	2	12	4,678	3,049	3,460	78,435	3,616	5,449	106,088
Other Brit. West Indies	......	......	......	......	3,370	......	......	6,333	5,439	2,340	33,700	4,059	3,870	52,778
Cuba	105	10	30	15	454,908	344	1,131	350,159	231,951	86,060	2,013,071	134,552	419,288	3,340,986
Danish West Indies	112	12	......	......	2,469	......	......	1,468	1,774	1,440	8,679	508	2,679	17,561
Dutch West Indies	......	......	......	......	6,614	......	......	477	433	167	10,390	138	1,187	18,929
French West Indies	......	......	......	......	8,258	2	17	2,535	2,114	54	159,176	7,880	6,153	183,652
Haiti	......	......	......	......	3,794	......	......	595	714	3,727	60,102	873	6,565	75,775
Dominican Republic	......	......	......	......	15,785	12	30	1,305	1,493	11,878	121,891	7,832	18,858	177,767
TOTALS, NORTH AMERICA	2,317,526	$178,706	3,750,168	$619,539	$1,854,569	138,016	$419,579	680,010	$575,966	$521,087	$5,188,317	$328,196	$3,074,150	$12,760,109
SOUTH AMERICA:														
Argentina	......	......	......	......	$236,980	16	$76	61,338	$53,553	$65,146	$1,788,147	$84,051	$272,768	$2,500,721
Bolivia	......	......	......	......	34,947	......	......	......	......	1,315	24,191	158	1,915	62,526
Brazil	......	......	......	......	329,713	494	2,475	92,834	77,343	46,490	1,018,055	27,362	273,095	1,774,533
Chile	......	......	......	......	358,326	3,002	12,480	25,605	21,389	39,039	795,440	26,720	139,736	1,393,130
Colombia	......	......	......	......	16,027	37	102	7,364	6,843	9,154	124,238	9,858	25,285	191,507
Ecuador	......	......	......	......	11,555	36	126	2,970	2,687	5,797	77,189	628	4,743	102,725
British Guiana	......	......	......	......	4,803	......	......	7,699	8,873	531	49,637	3,891	3,510	71,245
Dutch Guiana	......	......	......	......	1,009	......	......	120	78	548	3,265	......	1,180	6,080
French Guiana	......	......	......	......	......	4	20	53	70	......	81	......	3	174
Paraguay	......	......	......	......	5,482	......	......	106	114	175	2,046	......	740	8,557
Peru	......	......	......	......	122,546	1,481	9,030	3,291	3,653	11,010	230,812	5,111	37,608	419,770
Uruguay	......	......	......	......	43,863	560	630	24,769	20,909	19,784	645,970	2,555	85,955	819,666
Venezuela	......	......	......	......	20,948	72	259	285	230	12,326	226,953	2,372	19,239	282,327
TOTALS SOUTH AMERICA	......	......	......	......	$1,186,199	5,702	$25,198	226,434	$195,742	$211,315	$4,986,024	$162,706	$865,777	$7,632,961

	Scrap and Old. Pounds.	Scrap and Old. Value.	Reclaimed. Pounds.	Reclaimed. Value.	Belting, Hose, and Packing. Value.	Boots. Pairs.	Boots. Value.	Shoes. Pairs.	Shoes. Value.	Druggists' Rubber Sundries. Value.	Automobile Tires. Casings. Value.	Automobile Tires. All Other. Value.	All Other Manufactures of Rubber Value.	Totals. Value.
OCEANIA														
Australia	...	...	...	...	$199,101	1,773	$5,478	151,673	$99,477	$54,071	$751,584	$32,469	$199,569	$1,341,749
New Zealand	...	...	...	...	123,653	14,734	41,609	15,272	17,549	17,067	1,023,807	29,637	124,917	[illegible]
Other Brit. Oceania	...	...	...	...	1,297	...	...	753	1,329	295	7,118	282	987	11,308
French Oceania	...	...	...	...	2,974	...	...	1,336	1,558	52	13,516	3,733	2,857	[illegible]
German Oceania	...	...	...	...	29	11	33	241	334	...	8,862	546	2,718	[illegible]
Philippine Islands	...	...	...	...	279,282	1,319	2,878	153,305	146,311	26,273	1,372,544	125,522	437,567	2,390,377
TOTALS, OCEANIA	...	...	...	...	$606,336	17,837	$49,998	322,580	$266,558	$97,758	$3,177,431	$192,189	$768,615	[illegible]
ASIA:														
Aden	...	...	...	...	...	...	...	...	...	...	$1,847	...	...	$1,847
China	49	$14	...	...	$83,330	315	$888	98,031	$106,099	$21,418	254,784	$8,618	$82,224	557,375
Japanese China	...	...	...	...	574	808	1,697	8,797	10,192	252	1,425		8,924	[illegible]
Chosen	...	...	...	...	2,704	48	304	1,394	1,218	162	11,538	150	3,879	[illegible]
British India	...	...	...	...	88,374	4	16	8,255	6,429	18,724	557,396	23,154	[illegible]	[illegible]
Straits Settlements	...	...	20,000	$3,575	13,437	12	30	2,413	2,596	2,693	636,101	14,858	[illegible]	[illegible]
Other British East Indies	...	...	...	...	4,380	...	...	320	163	322	18,477		1,857	[illegible]
Dutch East Indies	...	...	...	...	36,466	3	18	1,974	2,735	4,096	686,873	[illegible]	65,570	[illegible]
French East Indies	...	...	...	...	16,806	...	...	24	15	167	7,518	305	483	[illegible]
Hongkong	...	...	...	...	12,684	373	1,089	8,192	7,424	2,656	79,334	2,204	12,641	[illegible]
Japan	1,453,462	66,356	46,574	7,397	301,792	28,517	56,022	393,679	390,663	16,779	422,432	5,108	[illegible]	[illegible]
Persia	...	...	...	...	...	...	...	...	...	...	1,092	...		[illegible]
Russia in Asia	...	...	...	...	36,272	6,165	21,860	162,340	204,823	11,064	266,674	...	[illegible]	[illegible]
Siam	...	...	...	...	1,830	...	...	234	281	842	12,239	505	2,487	[illegible]
Turkey in Asia	...	175	...	...	1,016	223	669	13,981	16,492	81	12,734	...	[illegible]	[illegible]
TOTALS, ASIA	1,453,511	$66,370	66,574	$10,972	$599,665	36,468	$82,593	699,634	$749,130	$79,256	$2,970,464	$95,237	$646,348	[illegible]
AFRICA:														
Belgian Congo	...	...	...	...	$70,467	...	...	4	$5	...	...	...	$215	$70,687
British West Africa	...	...	...	...	10,335	2	$13	71	148	$282	$122,940	$268	1,747	135,733
British South Africa	...	...	7,200	$1,597	564,972	3,969	12,385	67,377	54,368	19,019	479,934	27,937	136,183	[illegible]
British East Africa	...	...	...	...	21	...	...	372	230	42	32,402	...	1,835	[illegible]
Canary Islands	...	...	...	...	...	...	...	...	...	...	4,545	7	...	[illegible]
French Africa	...	...	...	...	5,767	1	3	...	...	...	28,321	13	[illegible]	[illegible]
German Africa	...	...	...	...	...	...	...	...	...	5	...	...	[illegible]	[illegible]
Italian Africa	...	...	...	...	2,579	...	...	...	...	...	...	...		[illegible]
Liberia	...	...	...	...	...	...	...	8	20	21	45	...	4	[illegible]
Morocco	...	...	...	...	904	...	...	300	255		225			[illegible]
Portuguese Africa	...	...	...	...	50,791	184	823	32	101	463	150	405	[illegible]	[illegible]
Egypt	...	...	...	...	2,143	...	...	1,043	911	219	25,881	[illegible]	[illegible]	[illegible]
TOTALS, AFRICA	...	...	7,200	$1,597	$708,979	4,156	$13,224	69,207	$56,038	$20,351	$694,943	$31,748	[illegible]	[illegible]
Calendar year, 1919	8,292,053	$808,993	5,070,632	$839,928	$6,100,460	261,110	$714,713	5,794,488	$4,551,386	$1,270,506	$28,924,659	[illegible]	[illegible]	[illegible]
[4]Calendar year, 1918	2,931,929	287,883	2,904,234	502,176	4,525,243	772,586	2,799,116	1,285,110	1,584,747	772,539	14,511,521	755,888	[illegible]	[illegible]
[5]Fiscal year, 1917-18	2,117,257	235,811	3,284,958	567,278	4,578,396	1,559,598	4,861,213	1,244,170	913,128	884,245	13,977,671	[illegible]	[illegible]	[illegible]
Fiscal year, 1916-17	3,696,661	415,526	4,938,991	814,169	3,532,384	600,455	1,483,379	3,356,484	1,716,225	...	12,330,201	[illegible]	[illegible]	[illegible]
Fiscal year, 1915-16	3,904,715	400,148	6,406,946	871,262	2,986,953	720,130	1,619,260	1,976,896	1,046,102	...	17,936,127	3,003,077	[illegible]	[illegible]
Fiscal year, 1914-15	2,422,091	291,421	5,970,380	822,561	1,807,848	318,727	726,765	2,219,900	2,053,560	...	[illegible]	[illegible]	[illegible]	[illegible]
Fiscal year, 1913-14	6,207,672	598,287	5,583,860	834,440	2,372,887	101,361	279,206	1,634,258	834,289	...	[illegible]	563,372	[illegible]	[illegible]
Fiscal year, 1912-13	7,269,465	880,442	5,413,247	932,904	2,605,551	109,528	274,330	2,231,467	1,163,953	...	[illegible]	611,458	[illegible]	[illegible]
						Boots and Shoes.[1]								
							Pairs.	Value.						
Fiscal year, 1911-12	7,336,984	$780,188	5,397,806	$875,501	$2,315,484	...	2,545,076	$1,502,890	...	...	[illegible]	[illegible]	[illegible]	[illegible]
Fiscal year, 1910-11	7,049,729	723,664	4,994,527	781,650	2,163,416	...	3,984,332	2,219,430	...	...	[illegible]	592,476	[illegible]	[illegible]
Fiscal year, 1909-10	6,143,610	578,944	3,622,556	535,795	1,960,825	...	3,791,084	1,984,739	...	...	...	...	[illegible]	[illegible]
Fiscal year, 1908-09	4,071,795	402,897	3,196,551	414,861	1,498,445	...	2,396,435	1,292,673	...	...	...	...	[illegible]	[illegible]
Fiscal year, 1907-08	4,255,789	449,727	2,947,974	418,738	1,347,775	...	3,080,253	1,614,290	...	...	...	...	[illegible]	[illegible]
Fiscal year, 1906-07	4,756,621	548,695	4,550,788	665,109	1,253,369	...	2,310,420	1,231,898	...	...	...	...	[illegible]	[illegible]
Fiscal year, 1905-06	...	...	4,084,696	511,843	1,221,159	...	2,693,690	1,505,082	...	...	...	...	[illegible]	[illegible]
Fiscal year, 1904-05	...	...	a	522,902	994,100	...	2,399,539	1,214,342	...	...	...	...	[illegible]	[illegible]
Fiscal year, 1903-04	...	...	...	...	880,010	...	2,310,420	1,231,898	...	...	...	...	[illegible]	[illegible]
Fiscal year, 1902-03	...	...	...	...	819,985	...	2,307,401	1,056,491	...	...	...	...	[illegible]	[illegible]
Fiscal year, 1901-02	...	...	...	...	634,146	...	2,594,708	1,046,315	...	...	...	...	[illegible]	[illegible]
Fiscal year, 1900-01	...	...	...	...	565,726	...	1,459,100	724,015	...	...	...	...	[illegible]	[illegible]

a Not officially reported. [1]States separately after 1912. [2]Tires were not specifically reported before 1910-11. [3]Druggists' rubber sundries were not specifically reported before 1917-18. [4]These figures are given for the calendar year ended December 31, 1918. [5]Ended June 30, 1918.

(Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.)

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES, DURING THE MONTH OF JUNE, 1920.

EXPORTED TO—	Belting. Value.	Hose. Value.	Packing. Value.	Boots. Pairs.	Boots. Value.	Shoes. Pairs.	Shoes. Value.	Soles and Heels, Value.	Automobile Tires. Casings. Value.	Automobile Tires. Inner Tubes Value.	Automobile Tires. Solid Tires. Value.	Automobile Tires. All Others. Value.	Insulated Wire and Cables. Value.	Druggists' Rubber Sundries. Value.	All Other Manufactures of Rubber. Value.	Totals. Value.
EUROPE:																
Austria									$2,090							$2,090
Azores and Madeira Islands						240	$287								$13	300
Belgium						2,546	2,234		55,934	$11,610			$2,827	$422	4,864	77,891
Bulgaria		$698	$621			2,196	3,000		230				10			4,559
Denmark		660		1,800	$5,388	84,874	78,211	$25	69,053	7,101	$5,832	$89	377	380	2,851	169,967
Finland									14,442					885	645	15,972
France	$943	5				30,908	21,781		95,618	1,773	11,000		757		37,646	169,523
Germany									48,944	2,053					513	51,510
Gibraltar									358			13				371
Greece		449	31			119	158		15,187	1,943	418		307	554	200	19,247
Iceland and Faroe Islands						3,836	4,226									4,226
Italy		90	1,500	12	60	432	462		54,312	1,843			266	197	11,504	70,234
Malta, Gozo and Cyprus Islands						24	33		253	78						364
Netherlands	397	4,520	4,280			5,952	6,348		174,623	28,657	3,805	1,812	69,466	7,613	21,255	322,776
Norway	1,890	11		256	1,775	36,590	39,677		98,718	10,939	4,981	534	57,502	953	2,169	219,149
Poland and Danzig									4,700	7,400	7,367				37	19,504
Portugal		452		565	2,825	942	1,379	50	5,444	68	290		2,533	550	781	14,372
Roumania						17	38		9,426	8,060						17,524
Spain	2,943		41			26,225	28,990	6,244	152,908	15,721	4,750	90	13,708	3,093	14,553	243,041
Sweden	729	1,587	413			10,293	11,301		112,746	11,575	1,276	1,462	4,246	247	37,532	183,114
Switzerland	1,991	567	102			10,958	10,890		41,542	1,256			112	172	5,759	62,391
Turkey in Europe		189				11	14		12,482	2,093					50	14,828
England	3,759	52,527	5,940	1,572	5,248	213,385	177,108	6,697	214,474	9,247	1,711		70,943	5,542	121,416	674,612
Scotland	710		696			16,907	14,711		3,000						796	19,913
Ireland															1,756	1,756
TOTALS, EUROPE	$13,362	$61,755	$13,624	4,205	$15,296	446,455	$400,848	$13,016	$1,186,484	$121,417	$41,430	$4,000	$223,054	$20,608	$264,340	$2,379,234
NORTH AMERICA:																
Bermuda		$252	$13			2,472	$5,560	$357				$201	$2,371	$452	$762	$9,968
British Honduras		11	64	766	$1,288	1,527	2,142	471	$186	$29			311	26	239	4,767
Canada	$17,004	10,109	16,922	2,128	9,453	9,215	19,276	377	167,012	100,705	$71,455	9,749	13,878	30,619	317,161	783,720
Costa Rica	98	2,117	86			440	595	152	1,640	33	595		2,804	475	1,954	10,549
Guatemala	1,611	258				1,392	1,570		13,145	2,209	500	469	30	1,086	1,020	21,898
Honduras	198	426	214			2,925	4,089	1,321	4,194	656	697	52	1,217		2,354	15,418
Nicaragua	1,432	266	42	1	4	1,269	1,358	878	70	9		53	4,426	381	712	9,631
Panama	1,297	2,178	2,230			18,691	16,460	3,702	55,469	8,115	10,658	2,059	10,871	466	6,364	119,869
Salvador	1,897	85	36			2,088	1,258		8,546	757	1,154		1,372	182	412	15,699
Mexico	20,966	37,251	6,972	25	97	14,717	13,980	2,197	58,212	9,035	8,125	1,627	15,559	3,073	13,747	190,841
Miquelon, Langley, etc.				3,724	12,714											12,714
Newfoundland and Labrador	5,888	125	290	3,024	11,512	918	934	165	11,283	2,590	109		101	29	527	33,553
Barbados		37				246	347	31	812	60			170			1,457
Jamaica	268	695	347			2,545	3,417	741	12,687	3,624	842		715	469	330	24,135
Trinidad and Tobago		347	112			5,796	5,573	320	6,425	174	1,750	61	651	438	253	16,104
Other British West Indies	101	85				4,460	5,276	38	580	89	12,507	564	30	111	63	19,444
Cuba	7,145	18,015	10,997			77,940	73,154	12,123	152,167	25,544	15,293	15,441	77,035	21,246	36,985	465,145
Virgin Islands of U. S.						658	949		1,817	253			38	77	15	3,149
Dutch West Indies		14				441	663		402	21			140		172	1,412
French West Indies									1,688	394					164	2,246
Haiti		102	311			464	694		8,729	979			157	33	2,288	13,293
Dominican Republic	340	1,556	1,981			3,157	4,211	947	17,578	3,569	1,238	1,675	6,238	1,834	4,053	45,220
TOTALS, NORTH AMERICA	$58,245	$73,929	$40,617	9,668	$35,068	151,361	$161,506	$23,820	$522,642	$158,845	$124,923	$31,951	$138,114	$60,997	$389,575	$1,820,232
OCEANIA:																
Australia	$46,844	$8,524	$4,732	876	$2,450	5,067	$4,009		$118,100	$9,854	$2,853	$875	$2,976	$4,128	$13,771	$219,116
New Zealand	8,260	610	542			168	99	$2,621	223,062	8,224	10,827	4,000	504	1,520	12,118	272,387
Other British Oceania													80			80
French Oceania						528	675		1,261	69		171			147	2,323
Philippine Islands	11,879	6,124	8,360			5,476	6,520	11,202	298,386	71,758	17,369	21,007	23,324	1,052	24,441	501,422
TOTALS, OCEANIA	$66,983	$15,258	$13,634	876	$2,450	11,239	$11,303	$13,823	$640,809	$89,905	$31,049	$26,053	$26,884	$6,700	$50,477	$995,328
SOUTH AMERICA:																
Argentina	$304	$12,679	$513			10,001	$10,648	$2,570	$68,590	$7,893	$245	$335	$44,825	$7,508	$27,030	$183,140
Bolivia	6,555	1,432	784						908					469	6	10,154
Brazil	17,120	6,929	1,506	110	$918	46,900	44,980	7,678	65,463	5,992	4,062	45	55,369	6,492	20,484	237,038
Chile	57,693	8,252	5,405	290	1,407	1,881	1,577	52	32,246	3,410	309	1,619	12,811	2,272	9,905	136,958
Colombia	2,756	1,681	791			5,955	7,149	1,248	16,501	2,173	737	28	4,765	2,424	5,045	45,298
Ecuador		501	755					131	593	85			469	625	160	3,319
British Guiana		71	491			416	686		2,244	215	105		80		127	4,019
Dutch Guiana			320						110				180		940	1,550
Paraguay		282							115	32			230			659
Peru	1,204	3,053	2,724			47	52	175	22,327	1,905	2,979	442	4,987	4,120	3,332	47,300
Uruguay	377	1,553				4,349	4,251	649	64,500	17,357	933		1,495	1,170	4,580	96,865
Venezuela	1,007	1,320	63					287	13,796	2,978		89	2,424	2,611	2,274	26,849
TOTALS, SOUTH AMERICA	$87,016	$37,753	$13,352	400	$2,325	69,549	$69,343	$12,790	$287,393	$42,040	$9,370	$2,558	$127,635	$27,691	$73,883	$793,149

EXPORTED TO—	Belting. Value.	Hose. Value.	Packing. Value.	Boots. Pairs.	Boots. Value.	Shoes. Pairs.	Shoes. Value.	Soles and Heels, Value.	Automobile Tires. Casings. Value.	Automobile Tires. Inner Tubes. Value.	Automobile Tires. Solid Tires. Value.	Automobile Tires. All Others. Value.	Insulated Wire and Cables. Value.	Druggists' Rubber Sundries. Value.	All Other Manufactures of Rubber. Value	Totals. Value.
ASIA:																
Aden	......	......	......	......	......	......	......	......	$130	......	......	......	......	......	......	$130
China	$4,849	$2,476	$4,433	......	......	99	$85	145	17,698	$3,074	$2,664	$192	$2,769	$2,196	$6,258	46,839
Chosen	......	......	......	......	......	24	60	......	1,650	......	......	3,220	......	......	......	4,930
British India	4,458	6,418	7,010	59	$294	1,059	640	6	66,127	10,955	700	......	57,082	6,479	8,885	169,054
Straits Settlements	756	......	......	......	......	3,347	3,675	......	140,385	7,650	5,500	......	274	487	1,133	159,860
Other British East Indies	......	......	......	......	......	200	106	......	......	......	1,803	......	......	......	......	1,909
Dutch East Indies	108	3,896	450	......	......	196	209	474	127,464	6,466	24,575	......	11,018	821	7,792	183,273
French East Indies	......	2,288	......	......	......	......	......	......	3,764	791	307	......	......	......	......	7,150
Hongkong	371	......	505	......	......	137	277	......	1,200	257	......	......	......	74	504	3,188
Japan	21,657	11,515	9,135	536	1,587	58,960	66,780	1,228	17,589	1,355	1,014	697	1,925	486	12,524	147,492
Persia	......	......	......	......	......	4	5	......	1,859	......	......	......	......	......	......	1,864
Russia in Asia	......	......	......	......	......	......	......	......	......	......	......	......	......	......	8	8
Siam	......	......	......	......	......	......	......	......	1,000	......	......	......	......	......	687	1,687
Turkey in Asia	......	......	......	......	......	......	......	......	946	130	......	......	......	......	293	1,369
TOTALS, ASIA	$32,199	$26.593	$21.533	595	$1,881	64,026	$71,837	$1,853	$379,812	$30,678	$36,563	$4,109	$73,068	$10,543	$38,084	$728,753
AFRICA:																
Belgian Kongo	......	......	......	......	......	......	......	......	$531	......	......	......	......	......	......	$531
British West Africa	......	......	$40	......	......	168	$219	......	90,990	$12,328	......	......	......	......	$362	103,939
British South Africa	$29,914	$9,738	1,790	......	......	6,100	5,411	$8.983	53,297	17,125	$39,913	$2,557	$4,615	$2,106	35,758	211.207
British East Africa	......	......	......	......	......	200	125	......	16,359	1,496	......	......	......	......	......	17,980
Canary Islands	......	......	......	......	......	......	......	......	1,313	......	......	1,200	......	......	......	2,513
French Africa	......	......	......	......	......	......	......	......	827	218	......	......	......	......	......	1,045
Kamerun, etc.	......	......	......	......	......	......	......	......	124	......	......	......	......	......	20	144
Portuguese Africa	1,552	......	25	......	......	......	......	......	60	......	......	......	......	......	277	1,914
Egypt	......	......	......	......	......	56	92	24	6,216	188	......	2,849	......	840	118	10,327
TOTALS, AFRICA	$31,466	$9,738	$1,855	......	......	6,524	$5.847	$9,007	$169,717	$31,355	$39,913	$6,606	$4,615	$2,946	$36,535	$349,600
GRAND TOTALS	$289,271	$225,026	$104,615	15,744	$57,020	749,154	$720,684	$74,309	$3,186,857	$474,240	$283,248	$75,277	$593,370	$129,485	$852,894	$7,066,296

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORY OF THE UNITED STATES.

	Belting, Hose and Packing Values.	Boots and Shoes. Pairs.	Boots and Shoes. Value.	Tires. Automobile. Value.	Tires. All Others. Value.	Insulated Wire and Cables. Value.	Druggists' Rubber Sundries. Value.	All Other Manufactures of Rubber. Value.	Totals. Value.
Hawaii	$14,789	......	......	101,425	$6,056	......	......	$91,215	$213.485
Porto Rico	5,693	......	......	66,068	8,149	......	......	17,968	97.878
TOTALS	$20.482	......	......	$167,493	$14,205	......	......	$109,183	$311,363

(Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.)

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	June. 1919. Pounds	1919. Value	1920. Pounds.	1920. Value.
UNMANUFACTURED—*free*				
India rubber:				
From France	......	......	275,975	$80.334
Netherlands	......	......	1,928,772	904.276
Portugal	......	......	598,664	123,667
United Kingdom	3,288,020	$1,466,303	5,660,375	2,434 051
Canada	15,159	7,149	307,781	318,811
Central America.	61,893	28,398	15,331	4,389
Mexico	133,258	30,721	20,357	13,025
Brazil	3,138,771	854.559	2,264,845	631,506
Peru	87,934	30,046	......	......
Other South Am.	131,229	57.567	124,998	42,917
British E. Indies	25,659,290	10,600,470	26,265,065	12,639,688
Dutch E. Indies.	3,771,844	1,460,689	5,855,954	2,683,692
Other countries..	345,083	116,525	220,606	84,951
Totals	36,632,481	$14,652,427	43,538,723	$19,961,307
Balata	89,758	$54,839	141,683	$88,261
Guayule	872,646	209,523	224,982	39.327
Jelutong (Pontianak)	2,353,411	305,349	1,202,096	203,113
Gutta percha	608,309	102,064	645,880	120.551
Rubber scrap	1,030,894	74,376	1,145,902	83,550
Totals, unmanufactured	41,587,499	$15,398,578	46,899,266	$20,496,109
Chicle (dutiable)	689,161	$363,199	1,413,125	$903,710
MANUFACTURED—*dutiable*:				
India rubber and gutta percha	......	52,678	.....	144,009
India rubber substitutes	12,134	2,102	464	175

EXPORTS OF DOMESTIC MERCHANDISE.

	1919. Pounds	1919. Value	1920. Pounds.	1920. Value.
MANUFACTURED—				
India rubber:				
Scrap and old	473,282	$62,904	736,559	$64,026
Reclaimed	500,175	81,269	488,899	78,434
Belting[1]	......	585,337	......	289,271
Hose[1]	......		......	225,026
Packing[1]	......		......	104,615
Boots[1]	29,356	71,306	15.744	57,020
Shoes[1]	528,651	395,970	749,154	720,684
Soles and heels[1]	......	......	.....	74,309
Tires:				
For automobiles[1]	......	3,236,424	......	......
Casings[1]	......		.....	3,186,857
Inner tubes[1]	......		......	474,240
Solid tires[1]	......		......	283.248
All other tires[1]	......	259,014	......	75,277
Druggists' rubber sundries[1]	......	146,461	......	129,485
Suspenders and garters..	......	318,251	......	449,264
Other rubber manufactures[1]	......	889,151	......	852,894
Totals, manufactured.	......	$6,046,087	......	$7,064,650
Fountain pens....*number*	66,331	$46,360	63,777	$51,132
Insulated wire and cables[1]	......	1,420,699	.....	593,370

EXPORTS OF FOREIGN MERCHANDISE.

	1919. Pounds	1919. Value	1920. Pounds.	1920. Value.
UNMANUFACTURED—				
India rubber	379,635	$162,632	432,906	$157,820
Balata	22,335	15,155	9,743	6,574
Guayule	......	......	50	43
Jelutong (Pontianak)	......	......	53,071	9,975
Rubber scrap	......	......	781	234
Totals, unmanufactured	......	$177,787	......	$174,646
MANUFACTURED—				
Gutta percha	......	$63	......	$4,664
Totals, manufactured	......	$63	......	$4,664
India rubber substitutes.	50	131	......	......
Chicle	33,799	18,589	2,893	1,013

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

	1919. Pounds	1919. Value	1920. Pounds.	1920. Value.
MANUFACTURED—				
To Alaska:				
Belting, hose and packing	......	$11,828	......	$10,268
Boots and shoes.*pairs*	6,766	19,164	4,454	13,591
Other rubber goods..	......	5,109	......	5,165
Totals	......	$36,101	......	$29,024
To Hawaii:				
Belting, hose and packing	.....	$15,398	.....	$14.789
Automobile tires	......	63,065	......	101,425
Other tires	...	3,841	.....	6,056
Other rubber	....	21,472	......	19,469
Totals	......	$103,776	......	$141,739
To Porto Rico:				
Belting, hose and packing	.....	$4,707	......	$5.693
Automobile tires	......	66,343	.....	66.068
Other tires	......	3,182	......	8,149
Other rubber goods..	......	15,766	......	17.968
Totals	......	$89,998	......	$97,878

To Philippine Islands—treated as foreign commerce.

[1]Details of exports of domestic merchandise by countries during June, 1920, are given on pages 856-857 of this issue.

UNITED STATES CRUDE RUBBER IMPORTS FOR 1920 (BY MONTHS).

1920.	Plantations.	Parás.	Africans.	Centrals.	Guayule.	Maniçoba and Matto Grosso.	Balata.	Miscellaneous Gum.	Waste.	Totals. 1920.	Totals. 1919.
January .... tons	17,799	2,620	821	111	....	....	....	....	....	21,351	7,235
February	29,681	2,456	558	265	34	....	....	....	....	32,994	17,456
March	28,533	2,463	514	23	114	3	113	983	1,252	33,998	28,223
April	21,036	1,893	628	29	79	10	22	812	448	24,957	28,146
May	24,443	2,025	662	95	113	....	45	1,059	224	28,666	97,410
June	12,911	1,352	427	27	164	....	7	552	164	15,604	16,319
July	14,695	1,115	34	40	....	....	8	1,283	312	17,487	17,965
Totals........	149,098	13,924	31,644	590	504	13	195	4,689	2,400	175,057	212,754

(Compiled by The Rubber Association of America, Inc.)

THE MARKET FOR RUBBER SCRAP.

NEW YORK.

THE INACTIVITY that has featured in the rubber scrap market is fundamentally due to the general curtailment of tire production and a consequent stagnation in crude rubber. Reclaimers appear to be well stocked with scrap and are not interested as customary at this time in Fall deliveries. Dealers have shown little interest in present prices that are all practically nominal quotations.

BOOTS AND SHOES. All grades are from ¼ to ½ cent lower than last month, depending on the willingness of the seller to make concessions. An average price for boots and shoes, delivered, is around 6.25 cents.

INNER TUBES. These have declined about ½ to 1 cent throughout the list, since a month ago. Holders have asked 14 to 14½ cents for No. 1 tubes, delivered.

TIRES. Prices are from ¼ to ½ cent lower than last month, standard auto tires being quoted around 2½ to 3 cents, delivered.

There has been very little interest shown in the other sorts, mechanicals being particularly lifeless.

QUOTATIONS FOR CARLOAD LOTS DELIVERED.

AUGUST 26, 1920.

Prices subject to change without notice.

BOOTS AND SHOES:			
Arctic tops	lb.	$0.075 @	
Boots and shoes	lb.	.06½ @	.06¾
Trimmed arctics	lb.	.05¼ @	.05¾
Untrimmed arctics	lb.	.04¼ @	.04¾
HARD RUBBER:			
Battery jars, black compound	lb.	.01 @	.01¼
No. 1, bright fracture	lb.	.23 @	.24
INNER TUBES:			
No. 1	lb.	.14½ @	.15
Compounded	lb.	.08½ @	.09
Red	lb.	.07 @	.07½
MECHANICALS:			
Black scrap, mixed, No. 1	lb.	.03½ @	.04
No. 2	lb.	.02½ @	.02¾
Car springs	lb.	.03½ @	.04
Heels	lb.	.03 @	.03½
Horse-shoe pads	lb.	.03 @	.03½
Hose, air brake	lb.	.03½ @	.03¾
fire, cotton lined	lb.	.01½ @	.01¾
garden	lb.	.01½ @	.01¾
Insulated wire stripping, free from fiber	lb.	.03½ @	.04
Matting	lb.	.01¼ @	.01½
Red packing	lb.	.05½ @	.06
Red scrap, No. 1	lb.	.09 @	.10
No. 2	lb.	.06¾ @	.07¼
White scrap No. 2	lb.	.08 @	.09
No. 1	lb.	.10 @	.11
TIRES:			
PNEUMATIC—			
Auto peelings	lb.	.03¾ @	.04¼
Bicycle	lb.	.02¼ @	.02¾
Standard white auto	lb.	.03¾ @	.04¼
Standard auto	lb.	.02½ @	.03
Stripped, unguaranteed	lb.	.01¾ @	.02¼
White, G. & G., M. & W., and U. S.	lb.	.04¼ @	.04¾
SOLID—			
Carriage	lb.	.04 @	.04¼
Irony	lb.	.01 @	
Truck	lb.	.03½ @	.03¾

THE MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

AMERICAN COTTON has shown a steady decline during August that was due to the excellent prospects for an increased crop, together with the uncertainty regarding consumption, as rumors of manufacturing curtailment were persistent.

From 40 cents quoted on August 2 for middling uplands spot cotton, the market slowly declined to 32.50 cents, the quotations on August 23. Quiet conditions prevailed until the close of the month, with spot quotations around 32 cents for middling uplands.

The Acting Secretary of Agriculture on July 21 signed the pink boll-worm quarantine order, applicable to Louisiana and Texas. It is effective August 1.

ARIZONA COTTON. As this is the period between crops, very little can be reported until the market for the new crop opens. Tentative quotations on the new staple are placed at 80 to 90 cents.

EGYPTIAN COTTON. A bumper crop is expected. The official acreage this season for Egyptian cotton is 1,827,888 feddans. This shows an increase of 254,226 feddans over the acreage in 1919, and is the largest ever planted in Egypt, the previous record being 1,755,270 feddans in 1914. One feddan equals 1,038 acres. The record of the past eight years, including 1920, is as follows:

1920	1,827,888	1916	1,655,512
1919	1,573,662	1915	1,186,003
1918	1,315,572	1914	1,755,270
1917	1,677,308	1913	1,723,094

Quotations on August 23 were 90 cents to $1 on Sakellarides, and 60 to 70 cents for uppers.

COTTON FABRICS. The market for all cotton fabrics used by the rubber trade is practically dead. Cotton goods can not be sold in quantities, even at reduced prices, because of unsettled market conditions. Fabric mills have caught up on orders and are looking for business, but the rubber trade is not interested in buying cotton goods at this time; in fact, many manufacturers are offering to sell surplus stocks. The following prices are largely nominal.

NEW YORK QUOTATIONS.

AUGUST 26, 1920.

Prices subject to change without notice.

ASBESTOS CLOTH:			
Brake lining, 2½ lbs. sq. yd., brass or copper insertion	lb.	*$1.00 @	1.10
2¼ lbs. sq. yd., brass or copper insertion	lb.	*1.10 @	1.15
BURLAPS:			
32—7-ounce	100 yards	@	
32—8-ounce		@	
40—7½-ounce		9.00 @	
40—8-ounce		9.25 @	
40—10-ounce		12.00 @	
40—10½-ounce		12.25 @	
45—7½-ounce		@	
45—8-ounce		@	
48—10-ounce		@	
DRILLS:			
38-inch 2.00-yard	yard	*.42½ @	
40-inch 2.47-yard		*.36⅛ @	
52-inch 1.90-yard		*.52⅝ @	
52-inch 1.95-yard		*.51⅜ @	
60-inch 1.52-yard		*.65⅞ @	

DUCK.			
CARRIAGE CLOTH:			
38-inch 2.00-yard enameling duck..........yard	*$0.42½	@	
38-inch 1.74-yard	*.48½	@	
72-inch 16.66-ounce	*[illegible]	@	
72-inch 17.21-ounce	*1.24	@	
MECHANICAL:			
Hose ....pound	*.78	@	.82
Belting	*.78	@	.82
HOLLANDS, 40-INCH:			
Acme ....yard		@	
Endurance		@	
Penn		@	
OSNABURGS:			
40-inch 2.35-yard ....yard		@	
40-inch 2.48-yard		@	
37½-inch 2.42-yard		@	
RAINCOAT FABRICS:			
COTTON.			
Bombazine 64 x 60..........yard	*.30	@	
60 x 48..........	*.27	@	
Cashmeres, cotton and wool, 36-inch, tan	.95	@	
Twills 64 x 72	*.46	@	
64 x 102	*.48	@	
Twill, mercerized, 36-inch, blue and black..........	.45	@	
tan and olive	.42½	@	
Tweed	*.80	@	1.40
printed	*.27½	@	
Plaids 60 x 48..........	*.28	@	
56 x 44..........	*.27	@	
Repp	*.40	@	.45
Prints 60 x 48..........	*.29	@	
64 x 60..........	*.32	@	
IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING PLAIN AND FANCIES:			
63-inch, 3¼ to 7½ ounces..........yard	1.00	@	2.50
36-inch, 2¾ to 5 ounces..........	.77	@	2.04
IMPORTED PLAID LINING (UNION AND COTTON):			
63-inch, 2 to 4 ounces..........yard	.86	@	1.71
36-inch, 2 to 4 ounces..........	.54	@	1.04
DOMESTIC WORSTED FABRICS:			
36-inch, 4½ to 8 ounces..........yard	.77	@	1.71
DOMESTIC WOVEN AND PLAID LININGS (COTTON):			
36-inch, 3¼ to 5 ounces..........	.24	@	.32
SHEETINGS, 40-INCH:			
48 x 48, 2.35-yard..........yard	.24½	@	
48 x 48, 2.50-yard..........	.23	@	
48 x 48, 2.85-yard..........	.19	@	
64 x 68, 3.15-yard..........	.26	@	
56 x 60, 3.60-yard..........	.19	@	
48 x 44, 3.75-yard..........	.17¾	@	
SILKS:			
Canton, 38-inch ....yard	.48½	@	
Schappe, 36-inch	.75	@	
STOCKINETTES:			
SINGLE THREAD:			
3½ Peeler, carded..........pound		@	
4½ Peeler, carded..........	*1.15	@	1.15¼
6½ Peeler, combed..........	*1.80	@	
DOUBLE THREAD:			
Zero Peeler, carded..........pound	*.98	@	.98½
3½ Peeler, carded..........	*1.04	@	1.04½
6½ Peeler, combed..........	*2.70¼	@	2.70½
TIRE FABRICS:			
BUILDING:			
17¼-ounce Sakellarides, combed ....pound	*2.35	@	
17¼-ounce Egyptian, combed	*2.15	@	
17¼-ounce Egyptian, carded	*2.05	@	
17¼-ounce Peelers, combed	*2.25	@	
17¼-ounce Peelers, carded	*1.47	@	
CORD:			
15-ounce Egyptian ....pound	*2.40	@	
BICYCLE:			
8-ounce American ....pound	*1.50	@	
10-ounce American	*1.48	@	
CHAFER:			
9¼-ounces Sea Island ....pound		@	
9¼-ounce Egyptian, carded	*2.29	@	
9½-ounce Peeler, carded	*1.71	@	

*Nominal.

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

NEW YORK.

The demand for rubber compounding pigments combined with that of the paint manufacturing industry has stimulated an increase of production in all of the principal lines. This increase is expected to continue for another year. The shortage in the supply of barytes is being sharply felt since it has seriously limited the production of such products as floated barytes, blanc fixe and lithopone, all of which are important in both the rubber and paint industries. Both the United States and Canada are being thoroughly searched for new workable deposits of crude barytes as a basis for future increased output. The present shortage is being relieved in a small degree by importations of German crude. Labor and transportation difficulties are gradually disappearing from the situation.

Regarding supplies in general, the present weakness of the market is due to accumulation of stocks in the hands of sellers and the lack of money to carry over this temporary period. The importing or manufacturing of any of these chemicals has not declined, and in many cases higher prices are being asked for later and future shipments by the manufacturers, as reflecting the real cost to produce these items.

Aniline. The demand for aniline oil has decreased considerably. Spot stock declined steadily in price several cents during the month and was weak at 31 cents.

Barytes. There has been no change in the general barytes situation. Facilities for production are overtaxed and output is hampered by labor and transportation difficulties. There will be a scarcity for some time affecting the lithopone and blanc fixe markets.

Benzol. The market is very firm. Producers are sold up on contracts at 33 cents per gallon for 90 per cent and 35 cents for the pure grade. Export demand is reported to be heavy.

Blacks. The manufacturers are operating at full capacity and the demand is sufficient to absorb all the production. There has been a reduction in the contract price of carbon black from 15 cents to 12 cents.

China Clay. This material is in good demand at steady prices. Imports are not heavy and are quickly absorbed.

CARBON BISULPHIDE. Production is fully taken and the price remains firm at 8½ cents.

CARBON TETRACHLORIDE. The market has held strong the entire month with a moderate and distinct advance in price to about 14½ cents spot.

DRY COLORS. The demand has been active and prices steady, especially in Spanish red oxide and ultramarine.

LITHARGE. The demand has been good and prices steady at 11¾ to 12½ cents. Consumption has been above normal.

LITHOPONE. Manufacturers are doing all they are able to meet the demand and make up the shortage. Next year will bring a decided increase in production with the starting up of new plants now under construction. Limited amounts are arriving from Belgium.

SUBLIMED LEAD. Consumption is heavy and production steady, although there are delays in delivery. Poor rail transportation service is a strong market factor and the price of 10 to 10¼ cents will probably hold for some time.

SULPHUR. Price and demand have continued steady.

SOLVENT NAPHTHA. Supplies are scarce and firm at 30 cents a gallon in carload lots.

WHITING. Producers are unable to meet the demand. No reduction in price is probable until the short supply is remedied.

ZINC OXIDE. Producers are sold up. The industry is still expanding. The demand is fully up to production and is liable to continue so for some time. Imports of zinc oxide are not arriving in large amounts. Prices remain unchanged.

NEW YORK QUOTATIONS.

AUGUST 26, 1920.

Prices subject to change without notice.

ACCELERATORS, ORGANIC.

Accelerene (New York)	lb.	$4.75	@
Accelemal	lb.	.60	@ .65
Aldehyde ammonia crystals	lb.	2.70	@ 3.25
Aniline oil	lb.	.33	@ .34
Excellerex	lb.	.70	@ .75
Hexamethylene tetramine (powdered)	lb.	2.70	@ 3.25
N. C. C.	lb.	.50	@
No. 999	lb.	.20	@
Paraphenylenediamine	lb.	2.70	@ 2.85
Thiocarbanilide	lb.	.55	@ .60
Velosan	lb.	3.70	@
Vul-Ko-Cene	lb.	.35	@
Virol	lb.	.80	@

ACCELERATORS, INORGANIC

Lead, dry red (bbls.)	lb.	.12¼	@
sublimed blue (bbls.)	lb.	.10	@
sublimed white (bbls.)	lb.	.10	@
white, basic carbonate (bbls.)	lb.	.10½	@
Lime, flour	lb.	.02	@
Litharge, domestic	lb.	.11¾	@ .15
imported	lb.	*.17	@
sublimed	lb.	.12	@
Magnesium, carbonate, light	lb.	.12½	@
calcined extra light	lb.	.60	@
calcined light	lb.	.35	@
calcined medium light	lb.	.30	@
calcined heavy	lb.	.07½	@ .09
calcined commercial (magnesite)	lb.	.04	@
oxide, extra light	lb.	.22	@
light technical	lb.	.38	@
light, imported	lb.	.55	@
imported	lb.	.55	@

ACIDS.

Acetic, 28 per cent (bbls.)	cwt.	3.75	@ 4.50
glacial, 99 per cent (carboys)	cwt.	15.95	@16.70
Cresylic (97% straw color) (drums)	gal.	1.20	@ 1.30
(95% dark) (drums)	gal.	1.10	@ 1.20
Muriatic, 20 degrees	cwt.	2.25	@ 2.50
Nitric, 36 degrees	cwt.	6.25	@ 6.50
Sulphuric, 66 degrees	ton	22.00	@24.00

ALKALIES.

Caustic soda 76 per cent (bbls.)	lb.	.06	@ .07½
Soda ash (bbls.)	lb.	.05	@

COLORS.

Black:

Bone, powdered	lb.	[illegible]	@
granulated	lb.	.11	@
Carbon black (sacks, factory)	lb.	.15	@ .25
pressed	lb.	[illegible]	@
Drop	lb.	.05½	@ .15
Ivory black	lb.	.16	@ .30
Lampblack	lb.	.12	@ .45
Oil soluble aniline	lb.	1.00	@
Rubber black	lb.	.09½	@

Blue:

Cobalt	lb.	$0.25	@$0.35
Prussian	lb.	1.00	@
Ultramarine	lb.	.18	@ .50
Rubber makers' blue	lb.	3.50	@

Brown:

Iron oxide	lb.	.04	@ .04½
Sienna, Italian, raw and burnt	lb.	.05	@ .16
Umber, Turkey, raw and burnt	lb.	.06	@ .10
Vandyke	lb.	.08	@ .10
Maroon oxide	lb.	.15	@

Green:

Chrome, light	lb.	.42	@ .70
medium	lb.	.42	@ .70
dark	lb.	.50	@ .70
commercial	lb.	.07	@ .15
tile	lb.	.20	@
Oxide I. R.	lb.	.85	@
Oxide of chromium (casks)	lb.	.74	@ 1.25
Rubber makers' green	lb.	3.50	@

Red:

Antimony, crimson, sulphuret of (casks)	lb.	.45	@
crimson, "Mephisto" (casks)	lb.	.60	@
crimson, "R. M. P."	lb.	.65	@
Antimony, golden sulphuret of (casks)	lb.	.20	@ .22
golden sulphuret (States)	lb.	.35	@ .40
golden, "Mephisto" (casks)	lb.	.33	@
golden, "R. M. P."	lb.	.33	@
red sulphuret (States)	lb.	.25	@ .30
vermilion sulphuret	lb.	.55	@
Arsenic, red sulphide	lb.	.18	@
Indian	lb.	.14	@
Para toner	lb.	2.25	@
Red excelsior	lb.	.19	@ .22
Toluidine toner	lb.	4.25	@
Iron oxide, reduced grades	lb.	.06	@ .12
pure bright	lb.	.15	@ .17
Spanish neutral	lb.	.05¾	@
Venetian	lb.	.02½	@ .06½
Oil soluble aniline, red	lb.	1.75	@ 2.00
orange	lb.	1.65	@
Oximony	lb.	.18	@
Vermilion, American	lb.	.25	@ .30
permanent	lb.	.37	@
English quicksilver	lb.	1.55	@ 1.75
Rubber makers' red	lb.	3.50	@ 4.00
purple	lb.	2.50	@

White:

Albalith	lb.	.07¾	@ .08¼
Aluminum bronze, extra brilliant	lb.	.65	@
extra fine	lb.	.75	@
Lithopone, domestic	lb.	.07¾	@ .08¼
Ponolith (carloads, factory)	lb.		@
Rubber-makers' white	lb.	.11¼	@
Zinc oxide. American (factory):		C. L.	L. C. L.
Special	lb.	.10½	@ .11
XX red	lb.	.10	@ .10½
French process (factory):			
White seal	lb.	.13½	@ .13¾
Green seal	lb.	.12¼	@ .12¾
Red seal	lb.	.11¼	@ .11¾
Azo factory:			
ZZZ (lead free)	lb.	.10	@ .10½
ZZ (under 5% leaded)	lb.	.09	@ .09½
Z (8-10% leaded)	lb.	.08¼	@ .08¾

Yellow:

Cadmium, sulphide, yellow, light, orange	lb.	2.10	@
red	lb.	2.10	@
Chrome, light and medium	lb.	.35	@
Ochre, domestic	lb.	.04	@ .05
imported	lb.	.05½	@ .06½
Oil, soluble aniline	lb.	1.75	@
Rubber makers' yellow	lb.	2.50	@ 3.50
Zinc chromate	lb.	.50	@

COMPOUNDING INGREDIENTS.

Aluminum flake (carload)	ton	45.00	@
silicate	ton	26.00	@35.00
Ammonium carbonate (powdered)	lb.	.17¾	@
Asbestine (carloads)	ton	27.00	@
Barium, carbonate, precipitated	ton	100.00	@
sulphide, precipitated	lb.	.05	@
dust	ton	110.00	@
Barytes, pure white (f. o. b. works)	ton	28.00	@
off color	ton	20.00	@
uniform floated	ton	28.00	@
Basofor	lb.	.06½	@
Blanc fixe (dry, bbls.)	lb.	.06	@
Bone ash	lb.	.10	@
Carrara filler	lb.	.02	@ .04
Chalk, precipitated, extra light	lb.	.05	@ .05½
heavy	lb.	.04	@ .04½
China clay, Dixie	ton	22.00	@
Blue Ridge	ton	22.00	@
domestic	ton	10.00	@20.00
imported	ton	19.00	@24.00
Shawnee	ton	20.00	@
Cotton linters, clean mill run, f. o. b. factory	lb.	.03	@ .04
Fossil flour (powdered)	ton	60.00	@
(bolted)	ton	65.00	@
Diatomite	lb.	.03	@ .04
Glue, high grade	lb.	.35	@ .45
medium	lb.	.30	@ .35
low grade	lb.	.20	@ .25
Graphite, flake (400-pound bbl.)	lb.	.10	@ .30
amorphous	lb.	.05	@ .08
Ground glass FF. (bbls.)	lb.	.03	@

Infusorial earth (powdered)	ton	60.00	@	
(bolted)	ton	65.00	@	
Liquid rubber	lb.	.18	@	
Mica, powdered	lb.	[illegible]	@	
Pumice stone, powdered (bbl.)	lb.	.05	@	.10
Rotten stone, powdered	lb.	.02½	@	.04½
Rubber paste	lb.	.17	@	—
Silica, gold bond	ton	40.00	@	
silver bond	ton	28.00	@	
Soapstone, powdered gray (carloads)	ton	12.00	@	
Starch, powdered corn	cwt.	4.62	@	5.19
Talc, powdered soapstone	ton	18.00	@	[illegible]
Terra blanche	ton	25.00	@	30.00
Tripoli earth, air-floated, cream or rose (factory)	ton	50.00	@	
white (factory)	ton	52.50	@	
Tyrelith	ton	130.00	@	
Whiting, Alba (carloads)	cwt.	1.00	@	
[illegible]	cwt.	.8[illegible]	@	
commercial	cwt.	1.40	@	
Danish	ton	24.00	@	
English cliffstone	cwt.	2.00	@	
gilders	cwt.	1.45	@	1.55
Paris, white, American	ton	30.00	@	
Quaker	ton	16.00	@	
Super	ton	30.00	@	32.50
Wood pulp, imported	lb.	.03¾	@	
XXX	ton	65.00	@	
X	ton	60.00	@	
Wood flour, American	ton	*50.00	@	

MINERAL RUBBER.

Elateron (c. l. factory)	ton	60.00	@	
(l. c. l. factory)	ton	63.00	@	
Gilsonite	ton	75.00	@	
Genasco (c. l. factory)	ton	67.50	@	
(l. c. l. factory)	ton	69.50	@	
Hard hydrocarbon	ton	42.00	@	
Soft hydrocarbon	ton	40.00	@	
K-X	ton	150.00	@	
K. M. R.	ton	40.00	@	
M. R. X.	ton		@	
Pioneer (c. l. factory)	ton	60.00	@	
(l. c. l. factory)	ton	65.00	@	
Raven M. R.	ton	60.00	@	65.00
Refined Elaterite	ton	175.00	@	
Richmond	ton	75.00	@	
No. 64	ton	44.00	@	
318/320 M. P. hydrocarbon (c. l. factory)	ton	50.00	@	
(l. c. l. factory)	ton	53.00	@	
300/310 M. P. hydrocarbon (c. l. factory)	ton	47.50	@	
(l. c. l. factory)	ton	50.00	@	
Robertson, M. R. pulverized (c. l. factory)	ton	95.00	@	
M. R. pulverized (l. c. l. factory)	ton	75.00	@	
M. R. (c. l. factory)	ton	72.50	@	
M. R. (l. c. l. factory)	ton	75.00	@	
Rubrax (factory)	ton	50.00	@	
Synpro, granulated	ton	95.00	@	
Walpole rubber flux (factory)	lb.	.05	@	

OILS.

Avoilas compound	lb.	.17	@	.19
Castor, No. 1, U. S. P.	lb.	.18	@	
No. 3, U. S. P.	lb.	.17½	@	
Corn	lb.	.14	@	
Corn, refined Argo	cwt.	17.06	@	
Cotton	lb.	.13	@	
Glycerine (98 per cent)	lb.	.28	@	.29
Linseed, raw (carloads)	gal.	1.40	@	1.45
Linseed compound	gal.	*.85	@	
Palmoline	lb.	.14	@	.16
Palm niger	lb.	.13	@	
Palm special	lb.	.18	@	
Peanut	lb.	.15	@	
Petrolatum	lb.	.07	@	.12
Petrolatum, sticky	lb.	.09	@	.12
Petroleum grease	lb.	.07½	@	.09
Pine, steam distilled	gal.	2.00	@	2.10
Rapeseed, refined	lb.	.20	@	
blown	lb.	.21	@	
Rosin	gal.	.70	@	.98
Synpro	gal.	.70	@	1.00
Soya bean	lb.	.14	@	
Tar	gal.	.42½	@	

RESINS AND PITCHES.

Balsam, fir	gal.	1.75	@	1.80
Cantella gum	lb.	.55	@	
Cumar resin, hard	lb.	.12	@	.16
soft	lb.	.10	@	.14
Tar, retort	bbl.	16.00	@	
kiln	bbl.	15.00	@	
Pitch, Burgundy	lb.	.08	@	.10
coal tar	lb.	.01¼	@	
pine tar	lb.	.04	@	
tonto	lb.	.14	@	
Rosin, K	bbl.	15.60	@	
strained	bbl.	14.50	@	
Shellac, fine orange	lb.	1.75	@	

SOLVENTS.

Acetone (98.99 per cent drums)	lb.	.25	@	
methyl (drums)	gal.	1.50	@	
Benzol (water white, 90%)	gal.	.33	@	.38
Pet. naphthol	lb.	.85	@	
Carbon bisulphide (drums)	lb.	.08½	@	.09½
tetrachloride (drums)	lb.	.12¾	@	.16
Naphtha, motor gasoline (steel bbls.)	gal.	.32	@	
73 @ 76 degrees (steel bbls.)	gal.	.40	@	
70@ 72 (steel bbls.)	gal.	.38	@	
68 @ 70 degrees (steel bbls.)	gal.	.37	@	
V. M. & P. (steel bbls.)	gal.	.29	@	
Toluol, pure	[illegible]	[illegible]	@	[illegible]
Turpentine, spirits	gal.	1.59	@	
wood	gal.	1.50	@	1.55
[illegible]	[illegible]	[illegible]	@	
Xylol, pure	gal.	.4[illegible]	@	[illegible]
commercial	[illegible]	[illegible]	@	[illegible]

SUBSTITUTES.

Black	lb.	.10	@	.21
White	lb.	[illegible]	@	[illegible]
Brown	lb.	.15	@	.22
Brown factice	lb.	.09	@	.19
White factice	lb.	.10	@	.21
Paragol, soft and medium (carloads)	cwt.	18.58	@	
hard	cwt.	[illegible]	@	

VULCANIZING INGREDIENTS.

Lead, black hyposulphite (Black Hypo)	lb.	.32	@	.39
Orange mineral, domestic	lb.	[illegible]	@	
Sulphur chloride (jugs)	lb.	.20	@	
(drums)	lb.	.08	@	
Sulphur, flour, Brooklyn brand (carloads)	cwt.	3.40	@	
Bergenport, soft (c. l. factory)	cwt.	3.65	@	
Bergenport, soft (l. c. l. factory)	cwt.	4.00	@	
superfine (carloads, factory)	cwt.	*2.00	@	2.25

(See also Colors—Antimony.)

WAXES.

Wax, beeswax, white	lb.	.67	@	
ceresin, white	lb.	.20	@	
carnauba	lb.	.45	@	
ozokerite, black	lb.	.65	@	
green	lb.	.65	@	
Montan	lb.	.26	@	
paraffine, refined 118/120 m. p. (cases)	lb.	.12	@	
123/125 m. p. (cases)	lb.	.12½	@	
128/130 m. p. (cases)	lb.	.14	@	
Sweet wax	lb.	.14	@	

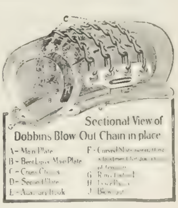
EAR DRUM PROTECTOR FOR OCEAN SPORT.

A little device that can be worn with comfort and without danger by those who delight in ocean sports, such as high diving, swimming, water polo, and the like, consists of two soft rubber disks mounted on a stem. These cling to the outer ear cavity, keeping the ear-drum protector in place, and permitting easy insertion and removal while, at the same time, preventing the protector from falling out. When in place the "Ocean" ear-drum protector is invisible. The protector comes in one size, which fits any ear, due to the elasticity of the rubber of which the disks are composed. The "Ocean" ear-drum protector is sold on display cards containing two dozen pairs neatly packed in small boxes attached to the card. (Safety Ear Drum Protector Co., 102 Lexington avenue, New York.)

"OCEAN" EAR DRUM PROTECTOR.

A HANDY REPAIR DEVICE.

The little invention pictured here in sectional view will, it is claimed, prevent throwing away a tire which has blown out. The "Dobbins" blow-out chains are attached when the tire is deflated, and the broken fabric and rubber are drawn together when inflated. The chains do not shift their position and are, it is said, as efficient for repairing a blow-out near the rim as in any other part of the tire. They are particularly designed for Fords and other lightweight cars and are made in two styles, for clincher and straight-side tires. With each chain is packed an inner patch which is to be placed directly over the hole or cut, on the inside of the shoe, with the sticky side next the casing. This device is easily attached, no tool other than an ordinary screwdriver being required. Full directions accompany the chains. (American Chain Co., Inc., Bridgeport, Connecticut.)



DOBBINS BLOW-OUT CHAINS.

INDIA RUBBER WORLD
FOUNDED 1889

Vol. 62 SEPTEMBER 1, 1920 No. 6

TABLE OF CONTENTS.

Editorials: Pages
- Assuring the Crude Rubber Supply 785
- No Slump in Sight 785-786
- Profit-Sharing, Piece Work and Bonuses 786
- Has the Fiber Sole Enemies? 786

Possibilities of the Peachey Process 787-789

Exports of India Rubber Manufactures from the United States During the Calendar Year 1919 789

Tire Bead Manufacture. By Robert C. Kelley, A.B.—Illustrated 790-791

Water Requirements for Rubber Mills. By Walter J. Bitterlich—Chart 791

O. S. Tweedy .... Portrait and Sketch 791

Will Rubber Soles Successfully Replace Leather Soles? By Chester C. Burnham .... Illustrated 792-795

Clifton Slusser .... Portrait and Sketch 795

International Discussion of Clincher and Straight-Side Tires 796

Testing Shipping Boxes .... Illustrated 796

Rubber Hose in Painting, Asphalt and Cement Coating .... Illustrated 797-798

Judicial Decisions 798

The Dollar Is Biggest in Buying Tires .... Illustrated 799

S. A. E. Standards Report of the Tire and Rim Division .... Diagrams 800-802

A Fund for Botanical Research in the Tropics 802

Toron and Toron-Treated Tires .... Illustrated 803-804

National Association of Waste Material Dealers, Standard Classification for Scrap Rubber 804

War Department Specifications for Mechanical Rubber Goods—III 805-808

Chemistry:
- What the Rubber Chemists Are Doing 809-811
  The Colloidal View-point of Rubber Chemistry. Carbon Black.
- Chemical Patents 811-812
- Laboratory Apparatus .... Illustrated 812

Machines and Appliances .... Illustrated 813-815
Improved Tire Building Machine. Tire Fabric Cleaning Machine. Vulcanizer for Factory Damaged Rubber Goods. The Lafayette Precision Tool Grinder. Retread Mold and Sectional Vulcanizer. Stock Cutter for Small Molded Goods. Repairable Air-Bag for Tire Repair.

Machinery Patents .... Illustrated 814-815
Apparatus for Making Carlisle Cord Tires. Other Machinery Patents.

Process Patents 815

Artistic Mold Work. By Arthur C. Squires—Illustrated 816

New Goods and Specialties .... Illustrated 817-818
A Clever Sponge Rubber Doll. French Heel with Rubber Lift. The Glove with Rubber Grips. Radiator Cover Operated from Driver's Seat. New British Army Waterproof. Pearson's Tobacco Pouch. A Western Steam-Curing Bag. The First Cuban Cord Tire. Dust Cap for Wire Wheels. "Pedalgrips" for Fords. A Detachable Vacuum Cleaner. A New Sport Shoe. The "Star" Massage Spray The Newcomer in Cord Tires.

Pages

The Rubber Association of America—Activities of 819

New Trade Publications 819-820

Editor's Book Table 820
"The Organization of Industrial Scientific Research." "A German-English Dictionary for Chemists."

Interesting Letters from Our Readers 820
Treügolnik Not Run by German Capital.

American Rubber Trade—News Notes and Personals 821-822
- Dividends 821
- Financial Notes 821-822
- New Incorporations 822
- Rubber Stock Quotations 822
- American Dunlop Building Nearing Completion. 822-823
- Franklin G. Hill .... Portrait and Sketch 823
- East and South 823-824
- New Jersey .... By Our Correspondent 824-825
- Massachusetts. By Our Correspondent—Illustrated 825-826
- Rhode Island .... By Our Correspondent 826-827
- Paul W. Litchfield .... Portrait and Sketch 827-828
- Ohio .... By Our Correspondent 828-829
- H. S. Vorhis .... Portrait and Sketch 829
- Mid-West .... By Our Correspondent 830-831
- Pacific Coast .... By Our Correspondent 831-832

Inquiries and Trade Opportunities 833

Foreign Rubber News:
- Miscellaneous Foreign Notes 833
- Great Britain .... By Our Correspondent 834-835
- Belgium .... Illustrated 835-836
- Austria 836-837
- German Cable Industry 837
- Tariff Notes 838
- French Indo-China 838-839
- India 839
- South American Notes 839
- Japan .... By Our Correspondent. 840-841
- Ceylon 841-842
- Malaya 842

Patents Relating to Rubber 843-844
United States. Canada. United Kingdom. Germany.

Trade-Marks 844-845
United States. United Kingdom. Canada. Australia.

Designs .... Illustrated 845
United States. Canada.

Pneumatic Tire Tread Designs .... Illustrated 846

Markets:
- Crude Rubber 846
  - Highest and Lowest New York Prices 847
  - Amsterdam Rubber Market 847
  - Antwerp Rubber Market 847
  - Singapore Rubber Market 847
- Reclaimed Rubber 847
- Rubber Scrap 858
- Cotton and Other Fabrics 858-859
- Chemicals and Ingredients 859-861

Statistics:
- Belawan, Crude Rubber Exports 847
- Brazil, Exports from Manáos, June, 1920, and for First Six Months of 1920 853
- Canada, Statistics for, April, 1920 852
- Ceylon Rubber Imports and Exports 847
- Federated Malay States Rubber Exports 847
- Italy, Statistics for January, 1920 853
- Java Rubber Exports 847
- Penang Rubber Exports 847
- Straits Settlements Rubber Exports 847
- United Kingdom, Statistics for June, 1920 852
- United States:
  - Crude Rubber Arrivals at Atlantic and Pacific Ports as Stated by Ships' Manifests 849-850
  - Custom House Statistics 851-852
  - Imports by Months for 1920 858
  - Exports of India Rubber Manufactures During June, 1920 (By Countries) 856-857
  - Calendar Year 1919 (By Countries) 854-855
  - United States Statistics for June 857

EMERGENCY MARKET BULLETIN

INDIA RUBBER WORLD

CAOUTCHOUC — FOUNDED 1889 — GUTTA-PERCHA

Reg. U. S. Pat. Off. Reg. United Kingdom.

Published by THE INDIA RUBBER PUBLISHING CO., No. 25 West 45th Street, New York

NOVEMBER 1, 1919

ANNOUNCEMENT

As the result of the strike of pressmen, feeders and paper handlers who have repudiated existing contracts, The India Rubber World of November 1, 1919, is delayed. The issue is ready for printing and will appear as soon as our press room is again in operation. Meanwhile this emergency bulletin containing market reviews and quotations as of October 25 is issued as a supplement. While it will reach subscribers ahead of the November 1 number, it will form an integral part of that issue in order to maintain the continuity of the market record. Thus the needs of those who have contracts based on The India Rubber World quotations will be met during the emergency. Nor will there be interruption of a service which has been maintained for thirty years.

The controversy which delays publication is between those who believe that a contract should be scrupulously adhered to and a relatively small group who regard a contract as a mere scrap of paper. With nearly two hundred other leading New York publications The India Rubber World is an unwilling victim of an internal disagreement between bodies of organized labor brought about by irresponsible local leaders. Among those who prize their honor in this matter are not only the publishers and employing printers, but a large percentage of the employes, notably compositors, who have declared that they will stand by their agreements. Meanwhile our staff and correspondents are gathering and preparing the news of the world's rubber industry as usual, and at the earliest possible moment this will reach subscribers in the customary form.

REVIEW OF THE CRUDE RUBBER MARKET.

NEW YORK.

Throughout October the rubber market has been very firm, with a steady and improving demand from the factories that has raised the price of plantation rubbers both here and abroad. The fluctuations in prices have been within narrow limits. At the close of the month prices were being strongly maintained. The Brazil market has been practically dead, the increase of production keeps the price down; it has become so unimportant that dealers take little interst in it. The market for guayule and balata has also been quiet. Prices for plantation and for South American rubber at the beginning and toward the close of the month are shown in the following quotations:

Plantation *Hevea*. September 27, first latex crêpe, spot 50-51½ cents, October-December 50¾ cents, January-March 51 cents, January-June 51-51½ cents, July-December, 1920. 52 cents, October 24, spot 53 cents, futures 53 cents, July-December, 1920, 53½ cents.

September 27, ribbed smoked sheet 49[illegible] cents, October-December 49¾ cents, January-March 50 cents, January-June 50 cents, July-December 1920, 51 cents, October 24, spot 52 cents, futures 52 cents, July-December, 1920, 52½ cents.

September 27, No. 1 amber crêpe, spot 47 cents, October 24, spot 49-50 cents.

September 27, clear thin brown crêpe, spot 46 cents, October 24, spot 44-46 cents.

September 27, No. 1 roll brown crêpe, spot 36½ cents, October 24, spot 40-41 cents.

South American Para and Caucho. Spot Prices: September 27, upriver fine 54 cents, islands fine 47 cents, upriver coarse 33¾ cents, islands coarse 21½ cents, Cametá coarse 22 cents, caucho ball 33¾ cents. October 24, spot prices practically unchanged.

NEW YORK QUOTATIONS.

Following are the New York spot quotations, for one year ago, one month ago and on October 25, the current date:

	November 1, 1918. Free Rubber.	October 1, 1919.	October 25, 1919.
PLANTATION HEVEA—			
First latex crêpe..	59 @	49½ @	53 @
Amber crêpe No. 1........	56 @	46½ @	49 @
Amber crêpe No. 2........	55 @	45½ @	48 @
Amber crêpe No. 3........	54 @	44½ @	47 @
Amber crêpe No. 4........	53 @	43½ @	46 @
Brown crêpe, thick and thin clean	53 @ 55	44½ @	44 @
Brown crêpe, thin specky...	44 @	42½ @	41½ @
Brown crêpe, rolled........	36 @	37 @	40½ @
Smoked sheet, ribbed, standard quality	57 @	48½ @	52 @
Smoked sheets, plain, standard quality	54 @	45 @	49 @
Unsmoked sheet, standard quality	50 @	42 @	47 @
Colombo scrap No. 1.......	40 @	38 @	35 @
Colombo scrap No. 2	38 @	36 @	34 @
EAST INDIAN—			
Assam crêpe	@	None	48 @
Assam onions	@	None	@
Penang block scrap........	@	None	@
PONTIANAK—			
Banjermassin	@	12 @	11 @ 12
Palembang	@	None	12¾ @
Pressed block	@	24 @	22½ @
Sarawak	@	None	09¾ @
SOUTH AMERICAN—			
PARAS—			
Upriver fine	62 @	54½ @	52½ @ 53
Upriver medium	56 @	52 @	50 @
Upriver coarse	37 @	33 @	34 @
Upriver weak, fine.......	@	41 @	41 @
Islands, fine	@	47½ @	47½ @ 48
Islands, medium	@	45 @	45 @
Islands, coarse	@	22 @	21 @
Cametá coarse	@	22½ @	23 @
Madeira, fine	@	56 @	53 @
Acre Bolivian, fine.......	@	55 @ 55½	53 @
Peruvian fine	@	52 @	51 @
Tapajos fine	@	53 @	50 @
CAUCHO—			
Lower caucho ball ...	@	31 @	31 @
Upper caucho ball...	37 @	33 @	35½ @

MANICOBAS—			
Ceara negro heads	@	28 @	40 @
Ceara scrap	@	28 @	30 @
Maniçoba (30% guarantee)	@	35 @	37 @
Mangabeira thin sheet	@	38 @	40 @
CENTRALS—			
Corinto scrap	38 @	33 @	34 @ 34½
Esmeralda sausage	38 @	32 @	34 @ 34½
Central scrap	38 @	32 @	34 @ 34½
Central scrap and strip	36 @	29 @ 30	30 @
Central wet sheet	27 @	23 @	24 @ 24½
Guayule (20% shrinkage)	@	24 @	27 @
Guayule, dry	35 @	35 @	36 @
AFRICANS—			
Niger flake, prime	28 @	@	18 @
Benguela, extra No. 1, 28%	@	@	@
Benguela No. 2, 32½%	@	25½ @	26½ @
Congo prime, black upper	@	39 @	@
Congo prime, red upper	@	@	@
Rio Nunez ball	@	@	@
Rio Nunez sheets and strings	@	@	@
Conakry niggers	@	@	@
Massai sheets and strings	@	@	@
GUTTA PERCHA—			
Gutta Siak	28 @	25 @	23 @ 25
Red Macassar	@	None	2.60 @ 2.75
BALATA—			
Block, Ciudad Bolivar	71 @	76 @	57 @ 60
Colombia	60 @	56 @	48 @ 50
Panama	58 @	42 @	40 @ 45
Surinam sheet	95 @	@	84 @ 85
amber	97 @	@	87 @ 88

RECLAIMED RUBBER.

The reclaimed rubber market has shown marked improvement the past month. Boot and shoe reclaims have been in strong demand due to activity in the carriage cloth, automobile topping and insulated wire trades. There has been slight improvement also in the call for tire reclaims by the mechanical goods trade. Prices remain unchanged from last month's quotations.

NEW YORK QUOTATIONS.

October 25, 1919

Subject to change without notice.

Standard reclaims:				
Floating	lb.	.30	@	.35
Friction	lb.	.25	@	.35
Mechanical	lb.	.11	@	.16
Red	lb.	.20	@	.25
Shoe	lb.	.15	@	.15⅛
Tires, auto	lb.	.15	@	.16¾
truck	lb.	.11½	@	.12½
White	lb.	.22	@	.25

THE MARKET FOR RUBBER SCRAP.

NEW YORK.

There has been hardly any change in the rubber scrap market since a month ago. Manufacturers have been buying in small lots, the interest being centered around boots and shoes and standard auto tires.

Price changes in the list since last month show a quarter of a cent advance in boots and shoes, a decline of one cent in standard white auto tires and three-eighths in solid truck tires, otherwise the list is unchanged.

QUOTATIONS FOR CARLOAD LOTS DELIVERED.

October 25, 1919.

Prices subject to change without notice.

BOOTS AND SHOES:				
Arctic tops	lb.	.01	@	
Boots and shoes	lb.	.08⅜	@	.08½
Trimmed arctics	lb.	.06½	@	.06⅝
Untrimmed arctics	lb.	.05⅝	@	
HARD RUBBER:				
Battery jars, black compound	lb.	.01	@	
No. 1, bright fracture	lb.	.23	@	.24
INNER TUBES:				
No. 1, old packing	lb.	.19	@	.20
No. 2	lb.	.10½	@	.10¾
Red	lb.	.10	@	.10½
MECHANICALS:				
Black scrap, mixed, No. 1	lb.	.03½	@	.04
No. 2	lb.	.03	@	
Car springs	lb.	.03½	@	.04
Heels	lb.	.03	@	.03½
Horse-shoe pads	lb.	.03	@	.03½
Hose, air brake	lb.	.04¼	@	
fire, cotton lined	lb.	.01½	@	.01¾
garden	lb.	.01½	@	.01¾
Insulated wire stripping, free from fiber	lb.	.03½	@	.04
Matting	lb.	.01¼	@	.01½
Red packing	lb.	.05½	@	.06
Red scrap, No. 1	lb.	.09	@	.10
No. 2	lb.	.06¾	@	.07¼
White scrap, No. 1	lb.	.10	@	.11
No. 2	lb.	.08	@	.09
TIRES:				
PNEUMATIC—				
Auto peelings, No. 1	lb.	.07	@	.08
No. 2	lb.	.05	@	.05½
Bicycle	lb.	.03	@	.03¼
Standard white auto	lb.	.03¼	@	.03⅞
Standard mixed auto	lb.	.04	@	
Stripped, unguaranteed	lb.	.03	@	
White, G. & G., M. & W., and U. S.	lb.	.05	@	.05¼
SOLID—				
Carriage	lb.	.04	@	.04½
Irony	lb.	.01	@	
Truck	lb.	.03½	@	.03¾

THE MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

In October, after hovering around 32 cents for a time with sharp fluctuations, the spot price for middling uplands cotton advanced steadily and reached 36.60 cents on October 24. Speculation was based on the conviction that the crop would be even shorter than the government estimate and that the quality would be poor. Rain and bad weather spoiled the cotton and interfered with picking the cotton in season, while the insect pests abounded, the boll weevil appearing farther north than ever before. The demand is very great and the prospect is that prices will be extremely high.

Egyptian Cotton. The supply of Egyptian cotton has been larger than was expected for the crop was good, though the staple was shorter than usual in many cases, owing to the native trick of cutting off the water in order to force the boll to open early. The high price offered offset in some degree English competition.

From the first to the middle of October, prices advanced sharply but later in the month the market fell off, medium Sakellarides being quoted 58½ cents and medium uppers at 56 cents.

American-Egyptian. Arizona has yielded the largest crop yet produced, but this, combined with imported Egyptian, will not make up for the deficiency due to the shortage of Sea Island cotton. A fair amount of this cotton has been marketed and the demand, although somewhat restricted, continues to take care of the output of all gins. Prices have held steadily around 68 and 70 cents for the best grades.

Sea Island Cotton. Sea Island cotton conditions show no change, with an exceedingly small crop in prospect. The government estimate of 15,000 bales will probably be reduced at the end of the year. Good grades are demanding very high prices. Probably a good grade of average extra choice could be bought for 70 cents.

Tire Fabrics. The market is very strong. Increased production of tires and the condition of the cotton crop, with the increased shortage in long staple, make it impossible for the mills to meet the demand. The product is sold substantially to the end of 1920.

Other Fabrics. A like excess of demand over supply prevails with other cotton fabrics. For waterproofing materials, for sheetings, for hose and belting, for drills and ducks it is the same story of goods very scarce and deliveries for next year only. Asbestos cloth and yarns are hard to get; there are almost no imports from England and none from Germany.

NEW YORK QUOTATIONS.

October 25, 1919.

Prices subject to change without notice.

ASBESTOS CLOTH:			
Brake lining, 2½ lbs. sq. yd., brass or copper insertion	lb	.85	@
2¼ lbs. sq. yd., brass or copper insertion	lb.	.90	@
BURLAPS:			
32—7-ounce	100 yards	*12.50	@
32—8-ounce		*13.50	@
40—7½-ounce		*14.15	@
40—8-ounce		*14.25	@
40—10-ounce	100 yards	*18.00	@
40—10½-ounce		*18.25	@
45—7½-ounce		*16.85	@
45—8-ounce		*17.00	@
45—9½ ounce		None	
48—10-ounce		*20.00	@
DRILLS:			
38-inch 2.00-yard	yard	*.35	@
40-inch 2.47-yard		*.28¾	@
52-inch 1.90-yard		*.46⅞	@
52-inch 1.95-yard		*.46¾	@
60-inch 1.52-yard		*.60	@

DUCK:			
CARRIAGE CLOTH:			
38-inch 2.00-yard enameling duck .... yard	*	.35[illegible] @	
38-inch 1.74-yard	*	.40[illegible] @	
72-inch 16.66-ounce	*	.88 @	
72-inch 17.21-ounce	*	.91 @	
MECHANICAL:			
Hose .... pound	*	.65 @	
Belting	*	.65 @	
HOLLANDS, 40-INCH:			
Acme .... yard	*	.30 @	
Endurance	*	.38 @	
Penn	*	.46 @	
OSNABURGS:			
40-inch 2.35-yard .... yard	*	.27[illegible] @	
40-inch 2.48-yard .... yard	*	.26¼ @	
37½-inch 2.42-yard	*	.26⅞ @	
RAINCOAT FABRICS:			
COTTON:			
Bombazine 64 x 60 water repellent .... yard		.23 @	
60 x 48 not water-repellent		.20 @	
Cashmeres, cotton and wool, 36 inch, tan		.95 @	
Twills 64 x 72		.43 @	
64 x 102		.45 @	
Twill, mercerized, 36-inch		.45 @	
Tweed		.60 @	.70
printed		.24 @	
Plaids 60 x 48		.21 @	
56 x 44		.20 @	
Repp		.45 @	.50
Surface prints 60 x 48		.21[illegible] @	
64 x 60		.24 @	
IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING—PLAIN AND FANCIES:			
63-inch, 3¼ to 7½ ounces .... yard		1.30 @	3.50
36-inch, 2¾ to 5 ounces		.75 @	1.90
IMPORTED PLAID LINING (UNION AND COTTON):			
63-inch, 2 to 4 ounces .... yard		.90 @	1.85
36-inch, 2 to 4 ounces		.55 @	1.10
DOMESTIC WORSTED FABRICS:			
36-inch, 4½ to 8 ounces .... yard		.65 @	1.50
DOMESTIC WOVEN PLAID LININGS (COTTON):			
36-inch, 3¾ to 5 ounces .... yard		.21 @	.32
SHEETINGS:			
40-inch, 2.35 yard .... yard		.30[illegible] @	
40-inch, 2.50 yard		.28¼ @	
40-inch, 2.70 yard		.26½ @	
40-inch, 2.85 yard		.25 @	
40-inch, 3.15 yard		.28 @	
40-inch, 3.60-yard		.24 @	
JACKET:			
Delaware .... yard		.30 @	
Schuylkill .... yard		.37 @	
SILKS:			
Canton, 38-inch .... yard		.57½ @	
Schappe, 36-inch		.75 @	
TIRE FABRICS:			
17¼-ounce Sea Island, combed .... pound		1.60 @	
17¼-ounce Egyptian, combed		1.40 @	
17¼-ounce Egyptian, carded		1.30 @	
17¼-ounce Peelers, combed		1.42 @	
17¼-ounce Peelers, carded		1.00 @	

*Nominal.

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

NEW YORK.

In common with other important industries the rubber trade is suffering from the abnormal freight and labor conditions prevalent. In New York movement of all water borne freight has been stopped for weeks. These conditions have stimulated demand for spot stocks and raised prices. In some lines production is very much oversold and deliveries postponed.

ANILINE OIL. Almost impossible to obtain at present from spot stock. Futures are booked so far that manufacturers cannot name a price or promise deliveries a month or six weeks ahead.

BARYTES. Stocks very low owing to shipments being tied up by harbor strikes.

BENZOL. Spot stock at great premium [illegible] supply in quantities [illegible] practically off the market on account of the steel strikes.

GOLDEN ANTIMONY. In great demand with supply very short.

MAGNESIA, HEAVY CALCINED. Stocks short, manufacturers oversold and in some cases closed down because raw supplies cannot be obtained owing to freight and labor troubles.

SULPHUR. General advance in all grades since October 1.

WHITINGS. Held at a premium because stocks are very low as shipments are tied up by the longshoremen's strike.

NEW YORK QUOTATIONS.

OCTOBER 25, 1919.

Subject to change without notice

ACCELERATORS, ORGANIC.			
Accelerator, N. C. C. .... lb.	[illegible] @		
Accelerene, New York .... lb.	[illegible] @		
Accelemal .... lb.	.55 @		
Aldehyde ammonia crystals .... lb.	1.00 @	1.25	
Aniline oil .... lb.	.32 @	.33½	
Excellerex .... lb.	[illegible] @		
Hexamethylene tetramine (powdered) .... lb.	[illegible] @	2.75	
Paraphenylenediamine .... lb.	3.50 @		
Thiocarbanilide .... lb.	.50 @		
ACCELERATORS, INORGANIC.			
Lead, dry red (bbls.) .... lb.	.10¼ @		
sublimed blue (bbls.) .... lb.	.08¼ @		
sublimed white (bbls.) .... lb.	.08¼ @		
white, basic carbonate (bbls.) .... lb.	.09 @		
Lime, flour .... lb.	.02 @	.02¼	
Litharge, domestic .... lb.	.09¼ @		
sublimed .... lb.	.10 @		
Magnesium, carbonate .... lb.	.12½ @		
calcined heavy (Thistle) .... lb.	.11 @		
light (Manhattan) .... lb.	.35 @		
Magnesium oxide .... lb.	.65 @		
Magnesite .... lb.	.04 @		
ACIDS.			
Acetic, 28 per cent (bbls.) .... lb.	.03 @		
glacial, 99 per cent (carboys) .... lb.	.12 @		
Cresylic (97% straw color) .... gal.	.77 @	.80	
(95% dark) .... gal.	.72 @	.75	
Muriatic, 20 degrees .... cwt.	1.75 @	2.00	
Nitric, 36 degrees .... lb.	.06 @	.06½	
Sulphuric, 66 degrees .... ton	19.20 @		
ALKALIES.			
Caustic soda, 76 per cent (bbls.) .... lb.	.05 @		
Soda ash (bbls.) .... lb.	.03½ @		
COLORS.			
Black:			
Bone, powdered .... lb.	.05 @		
granulated .... lb.	.09 @		
Carbon black (sacks, factory) .... lb.	.13 @		
Drop .... lb.	.06 @	.15	
Ivory black .... lb.	.16 @	.30	
Lampblack .... lb.	.15 @		
Oil soluble aniline .... lb.	1.25 @		
Rubber black .... lb.	.07 @		
Blue:			
Cobalt .... lb.	.25 @	.35	
Prussian .... lb.	.65 @	.75	
Ultramarine .... lb.	.18 @	.40	
Brown:			
Iron oxide .... lb.	.03 @	.03½	
Sienna, Italian, raw and burnt .... lb.	.05½ @	.12	
Umber, Turkey, raw and burnt .... lb.	.05 @	.06	
Vandyke .... lb.	.02½ @	.03½	
Green:			
Chrome, light .... lb.	.35 @	.40	
medium .... lb.	.40 @	.50	
dark .... lb.	.50 @	.60	
commercial .... lb.	.07 @	.15	
Oxide of chromium (casks) .... lb.	.75 @	.85	
Red:			
Antimony, crimson, sulphuret of (casks) .... lb.	.40 @		
Antimony, golden sulphuret of (casks) .... lb.	.35 @		
golden sulphuret (States) .... lb.	.30 @		
red sulphuret (States) .... lb.	.25 @		
vermilion sulphuret .... lb.	.55 @		
Arsenic, red sulphide .... lb.	[illegible] @		
Indian .... lb.	.08 @		
Toluidine toner .... lb.	3.50 @		
Iron oxide, reduced grades .... lb.	.14 @		
pure bright .... lb.	.16 @		
Spanish .... lb.	.03[illegible] @		
Venetian .... lb.	.0[illegible] @	.04½	
Oil soluble aniline, red .... lb.	[illegible] @		
orange .... lb.	[illegible] @		
Oximony .... lb.	.18 @		
Vermilion, English, pale, medium, dark .... lb.	.35 @	.40	
artificial .... lb.	.32 @		

White:

Aluminum bronze, C. P.	lb.	.55 @
superior	lb.	.60 @
Lithopone, domestic	lb.	.07 @ .07¼
Ponolith (carloads, factory)	lb.	*.07 @ .07
Rubber makers' white	lb.	*.06½ @ .06¾
Zinc oxide, Horsehead (less carload, factory): "XX red"	lb.	.09 @ .09¼
"Special"	lb.	.09½ @ .09¾
French process, red seal	lb.	.09½ @ .09¾
green seal	lb.	.10½ @ .10¾
white seal	lb.	.11½ @ .11¾
(States)	lb.	.08½ @
Azo, ZZZ, lead free (less carload factory)	lb.	.09¼ @
ZZ, under 5% leaded (less carload factory)	lb.	.08¼ @
Z, 8-10% leaded (less carload factory)	lb.	.08¼ @

Yellow:

Cadmium, sulphide, yellow, light, orange	lb.	2.00 @
red	lb.	1.85 @
Chrome, light and medium	lb.	.27 @
Ochre, domestic	lb.	.02½ @ .03½
imported	lb.	.05 @ .06½
Oil soluble aniline	lb.	2.00 @
Zinc chromate	lb.	.40 @

COMPOUNDING INGREDIENTS.

Aluminum flake	ton	28.00 @
Aluminum oxide	lb.	*.18 @
Ammonia carbonate, powdered	lb.	.13¼ @ .14
Asbestine (carloads)	ton	25.00 @
Asbestos (bags)	ton	35.00 @
Avoilas compound	lb.	.16 @
Barium, carbonate, precipitated	ton	65.00 @
sulphide, precipitated	lb.	.07 @
dust	lb.	.03¼ @
Barytes, pure white	ton	31.00 @ 33.00
Barytes, off color	ton	18.00 @ 20.00
uniform floated	ton	31.00 @ 33.00
Basofor	lb.	.04 @
Blanc fixe	lb.	.04 @
Bone ash	lb.	.05 @
Chalk, precipitated, extra light	lb.	.05 @ .05½
precipitated, heavy	lb.	.04 @ .04½
China clay, domestic	ton	8.50 @ 20.00
imported	ton	18.00 @ 23.50
Shawnee	ton	15.00 @
Cork flour	lb.	.53 @
Cotton linters, clean mill run, f. o. b. factory	lb.	.04 @
Fossil flour (powdered)	ton	60.00 @
(bolted)	ton	65.00 @
Diatomite	lb.	.03 @
Glue, high grade	lb.	.35 @ .40
medium	lb.	.16 @ .28
low grade	lb.	.12 @ .15
Graphite, flake (400-pound bbl.)	lb.	.10 @ .30
amorphous	lb.	.04 @ .08
Ground glass FF. (bbls.)	lb.	.03 @
Infusorial earth (powdered)	ton	60.00 @
(bolted)	ton	65.00 @
Liquid rubber	lb.	.16 @
Mica, powdered	lb.	.03½ @ .05
Pumice stone, powdered (bbl.)	lb.	.05 @
Rotten stone, powdered	lb.	.02½ @ .04½
Rub-R-Glu	lb.	*.20 @ .25
Silex (silica)	ton	22.00 @ 40.00
Starch, powdered corn (carload, bbls.)	cwt.	5.84 @
(carload, bags)	cwt.	5.62 @
Talc, powdered soapstone	ton	15.50 @ 17.50
Tripoli earth, air-floated	ton	25.00 @
Tyre-lith	ton	85.00 @
Whiting, Alba (carloads)	cwt.	.80 @ .90
Columbia	cwt.	.80 @
commercial	cwt.	1.25 @
English cliffstone	cwt.	2.00 @
gilders	cwt.	1.35 @
Paris, white, American	cwt.	1.75 @
Quaker	cwt.	.70 @ .80
Wood pulp, imported	lb.	.03½ @
Wood flour, American	lb.	.01¾ @

MINERAL RUBBER.

Gilsonite	ton	57.50 @
Genasco (carloads factory)	ton	55.00 @
(less carloads factory)	ton	57.00 @
Hard hydrocarbon	ton	30.00 @
K-X	ton	*120.00 @
K. M. R.	ton	*40.00 @ 60.00
M. R. X.	ton	160.00 @
Pioneer, carload, factory	ton	50.00 @
less carload, factory	ton	55.00 @
Raven M. R.	ton	.50 @ .70
Refined Elaterite	ton	175.00 @
Richmond	ton	75.00 @
No. 64	ton	44.00 @
318/320 M. P. hydrocarbon	ton	50.00 @
Robertson M. R. Special (carloads, factory)	ton	80.00 @
M. R. (carloads, factory)	ton	55.00 @ 60.00
Robertson (carloads, factory)	ton	50.00 @
(less car, factory)	ton	60.00 @
Walpole rubber flux (factory)	lb.	.05 @

OILS.

Castor, No. 1, U. S. P.	lb.	.22 @
No. 3, U. S. P.	lb.	[illegible] @
Corn, refined Argo	cwt.	23.76 @
Cotton	lb.	.23 @
Glycerine (98 per cent)	lb.	.21 @
Glycerole	lb.	.55 @
Linseed, raw (carloads)	gal.	1.90 @
Linseed compound	gal.	*.85 @
Palm (Niger)	lb.	.17 @
Peanut	lb.	.21½ @
Petrolatum	lb.	.06¼ @
Petroleum grease	lb.	.04¼ @
Pine, steam distilled	gal.	.90 @ 1.25
Rapeseed, refined	gal.	1.60 @
blown	lb.	.22 @
Rosin	bbl.	18.00 @
Soya bean	lb.	.18 @
Tar	gal.	.35 @ .40

RESINS AND PITCHES.

Cantella gum	lb.	.55 @
Tar, retort	bbl.	14.75 @ 15.00
kiln	bbl.	14.25 @ 14.75
Pitch, Burgundy	lb.	.0[illegible] @
coal tar	lb.	.03¼ @
pine tar	lb.	.03½ @
ponto	lb.	.14 @
Rosin	bbl.	None
granulated	lb.	None
fused	lb.	None
Rosin, K.	bbl.	19.50 @
Shellac, fine orange	lb.	1.25 @ 1.35

SOLVENTS.

Acetone (98.99 per cent drums)	lb.	.15 @
methyl (drums)	gal.	1.15 @
Benzol, water white	gal.	.25 @ .28
Beta-naphthol, resublimed	lb.	1.00 @
ordinary grade	lb.	.48 @
Carbon bisulphide (drums)	lb.	.05½ @ .06¾
tetrachloride (drums)	lb.	.10 @ .12
Naphtha, motor gasoline (steel bbls.)	gal.	.24½ @
73 @ 76 degrees (steel bbls.)	gal.	None
68 @ 70 degrees (steel bbls.)	gal.	None
Solvent	gal.	.20 @
V. M. & P. (steel bbls.)	gal.	.23½ @
Toluol, pure	gal.	.26 @ .30
Turpentine, spirits	gal.	1.71 @
wood	gal.	1.65 @
Osmaco reducer	gal.	.30 @
Xylol, pure	gal.	.35 @ .40
commercial	gal.	.30 @ .35

SUBSTITUTES.

Black	lb.	.10½ @ .19
White	lb.	.12 @ .23
Brown	lb.	.15 @ .22
Brown factice	lb.	.09 @ .21
White factice	lb.	.11 @ .22
Paragol soft and medium (carloads)	cwt.	18.58 @
hard	cwt.	18.08 @

VULCANIZING INGREDIENTS.

Lead, black hyposulphite (Black Hypo)	lb.	.52 @ .56
Orange mineral, domestic	lb.	.13¼ @
Sulphur chloride (drums)	lb.	.06 @ .06½
Sulphur, flour, Brooklyn brand (carloads)	cwt.	3.15 @
pure soft (carloads)	cwt.	3.20 @
superfine (carloads, factory)	cwt.	2.50 @

(See also Colors—Antimony)

WAXES.

Wax, beeswax, white	lb.	.65 @ .68
ceresin, white	lb.	.15 @ .18
carnauba	lb.	.47 @ .48
ozokerite, black	lb.	.60 @
green	lb.	.75 @
montan	lb.	.33 @
substitute	lb.	.20 @ .30
paraffine, refined 118/120 m. p. (cases)	lb.	.07½ @
123/125 m. p. (cases)	lb.	.07¾ @
128/130 m. p. (cases)	lb.	.08¾ @

*Nominal.

EMERGENCY MARKET BULLETIN

INDIA RUBBER WORLD

FOUNDED 1889

Published by THE INDIA RUBBER PUBLISHING CO., No. 25 West 45th Street, New York

DECEMBER 1, 1919

ANNOUNCEMENT

THE printers' strike is over. For eight weeks the radical element in the "Big Six" typographical union, in Pressmen's Union No. 51 and Franklin Union No. 23, has ruled. The majority, however, were secretly opposed to radicalism and favored obedience to the parent body, the International Typographical Union, that had promptly discountenanced the strike as contravening existing agreements. But the seccessionists broke these agreements, outgeneraled their opponents and refused to obey their superior officers.

The New York publishers and employing printers stood solidly together in the determination that radicalism must be effectively eliminated for all time from the printing industry of New York City. All faced severe financial loss and the danger of losing valuable prestige, yet they were confident that ultimately Americanism would win, and it did.

Following a mandate of the executives of the International Typographical Union that threatened their charter, the conservatives gained strength and outnumbering their opponents, voted to return to work.

In the meantime the November number of THE INDIA RUBBER WORLD has been delayed, but it is now being printed and will be mailed as soon as possible after December 1. The December number is ready for the printer and will closely follow the publication of the November issue.

REVIEW OF THE CRUDE RUBBER MARKET.

NEW YORK.

THE CRUDE RUBBER MARKET during the past month has been largely speculative, trading has been active, and there have been large offerings which were taken up as they came, but manufacturers were not as ready to buy as they were the month before. The market has run up to 54¼ cents for smoked sheets and has been as low as 52, but the prices for the beginning and the end of the month are practically the same; they have been affected somewhat by the drop in exchange. There is some interest in January-June arrivals.

Those in a position to know are skeptical about British estimates of largely increased production of plantation rubber for 1920 and 1921 and expect rather a falling off from the figures for 1919. It is rumored that the planters in the Far East are going to take concerted action to improve their property by tapping the trees only in alternate years.

Prices for plantation and South American rubber at the beginning and toward the close of the month are shown in the following quotations:

PLANTATION HEVEA. NOVEMBER 1, first latex crêpe, spot [illegible] cents, November-December 53½ cents, January-March 53½-54 cents, January-June [illegible] cents, July-December, 1920, [illegible] cents. NOVEMBER 20, spot 53 cents, futures 53½ cents.

NOVEMBER 1, ribbed smoked sheets, spot 53 cents, November-December 52½ cents, January-March 53 cents, January-June 52½-53 cents, July-December, 1920, 52½-53 cents. NOVEMBER 20, spot 52 cents, futures 52¼ cents, July-December, 1920, 52½ cents.

NOVEMBER 1, No. 1 amber crêpe, spot 51 cents, futures 50 cents. NOVEMBER 20, spot 50½ cents.

NOVEMBER 1, clear thin brown crêpe, spot 46-47 cents, January-June 47-48 cents. NOVEMBER 20, spot 48 cents.

NOVEMBER 1, No. 1 roll brown crêpe, spot 40-41 cents, futures 39-41 cents. NOVEMBER 20, spot 47½ cents, futures 41 cents.

SOUTH AMERICAN PARAS AND CAUCHO. NOVEMBER 1, spot prices: upriver fine 52½-53½ cents, islands fine 49-50 cents, upriver coarse 34-35 cents, islands coarse 22-25 cents, Cametá coarse 22-23 cents, caucho ball 34½-35 cents. NOVEMBER 20, spot prices: upriver fine 52 cents, islands fine 48 cents, upriver coarse 34¾ cents, islands coarse 22-23 cents, Cametá coarse 24-25 cents, caucho ball 35 cents.

NEW YORK QUOTATIONS.

Following are the New York spot quotations, for one year ago, one month ago and on November 25, the current date:

	December 1, 1918. Free Rubber.		November 1, 1919.		November 25, 1919.	
PLANTATION HEVEA—						
First latex crêpe	61½	@	53	@	52¾	@
Amber crêpe No. 1	57	@	49	@	51	@
Amber crêpe No. 2	56	@	48	@	50	@
Amber crêpe No. 3	55	@	47	@	49	@
Amber crêpe No. 4	54	@	46	@	47	@
Brown crêpe, thick and thin clean	53	@	44	@	47	@
Brown crêpe, thin specky	49	@	41	@	45	@
Brown crêpe, rolled	43	@	40½	@	43½	@
Smoked sheet, ribbed, standard quality	60½	@	52	@	[illegible]	@
Smoked sheets, plain, standard quality		@	49	@	54	@54½
Unsmoked sheet, standard quality		@	47	@	52	@
Colombo scrap No. 1		@	35	@	35	@
Colombo scrap No. 2		@	34	@	34	@
EAST INDIAN—						
Assam crêpe		@	48	@	49	@
Assam onions		@		@	47	@
Penang block scrap		@		@		@
PONTIANAK—						
Banjermassin		@	11	@12	11	@14
Palembang		@	12½	@	13	@
Pressed block		@	[illegible]	@	24	@27
Sarawak		@	[illegible]	@	11	@
SOUTH AMERICAN—						
PARAS—						
Upriver fine	64	@67	[illegible]	@[illegible]	50	@
Upriver medium		@	[illegible]	@	[illegible]	@
Upriver coarse	38	@39	[illegible]	@	[illegible]	@[illegible]
Upriver weak, fine	[illegible]	@	[illegible]	@	[illegible]	@
Islands, fine		@	[illegible]	@[illegible]	[illegible]	@[illegible]
Islands, medium		@	[illegible]	@	[illegible]	@[illegible]
Islands, coarse	[illegible]	@	[illegible]	@	[illegible]	@[illegible]
Cametá, coarse	[illegible]	@	[illegible]	@	[illegible]	@[illegible]
Madeira fine		@	[illegible]	@	[illegible]	@[illegible]
Acre Bolivian, fine		@	53½	@	51	@51½
Peruvian fine		@	[illegible]	@	51	@[illegible]
Tapajos fine		@	50	@	50	@
CAUCHO—						
Lower caucho ball		@	[illegible]	@	[illegible]	@[illegible]
Upper caucho ball	38	@39	35½	@	34	@35

Vermilion [illegible]	lb.	[illegible] @	
Oil soluble aniline, red	lb.	2.00 @	
orange	lb.	1.75 @	
Oximony	lb.	18 @	
Vermilion, English, pale, medium, dark	lb.	1 [illegible] @	
artificial	lb.	.32 @	
[illegible] quicksilver	lb.	1.4[illegible] @	1.50

White:

Aluminum bronze, C. P	lb.	.55 @	
superior	lb.	.60 @	
Lithopone, domestic	lb.	[illegible] @	.07¼
Ponolith (carloads, factory)	lb.	*.07 @	.07¾
Rubber makers' white	lb.	*.06½ @	.06¾
Zinc oxide, Horsehead (less carload, factory):			
"XX red"	lb.	.09 @	.09¼
"Special"	lb.	.09[illegible] @	.09[illegible]
French process, red seal	lb.	.09 @	.09¼
green seal	lb.	.10½ @	.10¾
white seal	lb.	.11 @	.11¼
(States)	lb.	.08½ @	
Azo, ZZZ, lead free (less carload factory)	lb.	.09¼ @	
ZZ, under 5% leaded (less carload factory)	lb.	.08¾ @	
Z, 8-10% leaded (less carload factory)	lb.	.08½ @	

Yellow:

Cadmium, sulphide, yellow, light, orange	lb.	2.00 @	
red	lb.	1.85 @	
Chrome, light and medium	lb.	.27 @	
Ochre, domestic	lb.	.02½ @	.03½
imported	lb.	*.05 @	.06½
Oil soluble aniline	lb.	2.00 @	
Zinc chromate	lb.	.40 @	

COMPOUNDING INGREDIENTS.

Aluminum flake	ton	@	
Aluminum oxide	lb.	*.18 @	
Ammonia carbonate, powdered	lb.	.13¼ @	.14
Asbestine (carloads)	ton	25.00 @	
Asbestos (bags)	ton	35.00 @	
Avoilas compound	lb.	.16 @	
Barium, carbonate, precipitated	ton	65.00 @	
sulphide, precipitated	lb.	.07 @	
dust	lb.	.04 @	
Barytes, pure white	ton	37.50 @	40.00
Barytes, off color	ton	18.00 @	25.00
uniform floated	ton	37.50 @	40.00
Basofor	lb.	.04 @	
Blanc fixe	lb.	.04 @	
Bone ash	lb.	.06 @	
Chalk, precipitated, extra light	lb.	.05 @	.05½
precipitated, heavy	lb.	.04 @	.04½
China clay, domestic	ton	8.50 @	20.00
imported	ton	18.00 @	23.50
Shawnee	ton	15.00 @	
Cork flour	lb.	.53 @	
Cotton linters, clean mill run, f. o. b. factory	lb.	.04 @	.04½
Fossil flour (powdered)	ton	50.00 @	
(bolted)	ton	60.00 @	
Diatomite	lb.	.03 @	
Glue, high grade	lb.	.20 @	.40
medium	lb.	.15 @	.19
low grade	lb.	.11 @	.14
Graphite, flake (400-pound bbl.)	lb.	.10 @	.30
amorphous	lb.	.04 @	.08
Ground glass FF. (bbls.)	lb.	.03 @	
Infusorial earth (powdered)	ton	50.00 @	
(bolted)	ton	60.00 @	
Liquid rubber	lb.	.16½ @	
Mica, powdered	lb.	.10 @	
Pumice stone, powdered (bbl.)	lb.	.05 @	
Rotten stone, powdered	lb.	.02½ @	.04½
Rub-R-Glu	lb.	*.20 @	.25
Silex (silica)	ton	22.00 @	40.00
Starch, powdered corn (carload, bbls.)	cwt.	5.34 @	
(carload, bags)	cwt.	5.12 @	
Talc, powdered soapstone	ton	15.50 @	17.50
Tripoli earth, air-floated	ton	25.00 @	
Tyre-lith	ton	85.00 @	
Whiting, Alba (carloads)	cwt.	.80 @	.90
Columbia	cwt.	.80 @	
commercial	cwt.	1.25 @	
English cliffstone	cwt.	1.75 @	2.00
gilders	cwt.	1.35 @	
Paris, white, American	cwt.	1.75 @	
Quaker	cwt.	.70 @	.80
Wood pulp, imported	lb.	.03½ @	
Wood flour, American	lb.	.01¾ @	

MINERAL RUBBER.

Gilsonite	ton	47.50 @	57.50
Genasco (carloads factory)	ton	55.00 @	
(less carloads factory)	ton	57.00 @	
Hard hydrocarbon	ton	30.00 @	
K-X	ton	110.00 @	
K. M. R	ton	*40.00 @	60.00
M. R. X	ton	100.00 @	
Pioneer, carload, factory	ton	55.00 @	
less carload, factory	ton	57.00 @	
Raven M. R	ton	50 @	.70
Refined Elaterite	ton	175.00 @	
Richmond	ton	75.00 @	
No. 64	ton	44.00 @	
318/320 M. P. hydrocarbon	ton	50.00 @	
Robertson M. R. Special (carloads, factory)	ton	80.00 @	
M. R. (carloads, factory)	ton	55.00 @	60.00
Rubpron (carloads, factory)	ton	50.00 @	
(less car, factory)	ton	60.00 @	
Walpole rubber flux (factory)	lb.	.05 @	

OILS.

Castor, No. 1, U. S. P	lb.	.22½ @	
No. 3, U. S. P	lb.	.18 @	
Corn, refined Argo	cwt.	23.56 @	
Cotton	lb.	.22 @	
Glycerine (98 per cent)	lb.	.21 @	
Glycerole	lb.	.55 @	
Linseed, raw (carloads)	gal.	1.90 @	
Linseed compound	gal.	*.85 @	
Palm (Niger)	lb.	.17 @	
Peanut	lb.	.23 @	
Petrolatum	lb.	.06 @	.06¼
Petroleum grease	lb.	.04¾ @	
Pine, steam distilled	gal.	1.28 @	
Rapeseed, refined	lb.	.21 @	
blown	lb.	.21 @	
Rosin	280 lbs. gross	18.00 @	
Soya bean	lb.	.18 @	
Tar	gal.	.30 @	.40

RESINS AND PITCHES.

Cantella gum	lb.	.55 @	
Tar, retort	bbl.	15.00 @	15.50
kiln	bbl.	14.50 @	15.00
Pitch, Burgundy	lb.	.09 @	
coal tar	bbl.	7.50 @	
pine tar	lb.	.03½ @	
ponto	lb.	.14 @	
Rosin	bbl.	None	
granulated	lb.	None	
fused	lb.	None	
Rosin, K.	bbl.	19.00 @	
Shellac, fine orange	lb.	1.20 @	

SOLVENTS.

Acetone (98.99 per cent drums)	lb.	.15 @	
methyl (drums)	gal.	1.15 @	
Benzol, water white	gal.	.24 @	.28
Beta-naphthol, resublimed	lb.	1.00 @	
ordinary grade	lb.	.55 @	
Carbon bisulphide (drums)	lb.	.05½ @	.06¼
tetrachloride (drums)	lb.	.11 @	.12½
Naphtha, motor gasoline (steel bbls.)	gal.	.24½ @	
73 @ 76 degrees (steel bbls.)	gal.	None	
68 @ 70 degrees (steel bbls.)	gal.	None	
Solvent	gal.	.20 @	
V. M. & P. (steel bbls.)	gal.	.23½ @	
Toluol, pure	gal.	.26 @	.30
Turpentine, spirits	gal.	1.71 @	
wood	gal.	1.65 @	
Osmaco reducer	gal.	.30 @	
Xylol, pure	gal.	.35 @	.40
commercial	gal.	.30 @	.35

SUBSTITUTES.

Black	lb.	.10½ @	.21
White	lb.	.11 @	.23
Brown	lb.	.15 @	.22
Brown factice	lb.	.09 @	.21
White factice	lb.	.11 @	.22
Paragol soft and medium (carloads)	cwt.	18.58 @	
hard	cwt.	18.08 @	

VULCANIZING INGREDIENTS.

Lead, black hyposulphite (Black Hypo)	lb.	.52 @	.56
Orange mineral, domestic	lb.	.13 @	
Sulphur chloride (drums)	lb.	.06½ @	
Sulphur, flour, Brooklyn brand (carloads)	cwt.	3.15 @	
pure soft (carloads)	cwt.	3.20 @	
superfine (carloads, factory)	cwt.	2.50 @	

(See also Colors—Antimony)

WAXES.

Wax, beeswax, white	lb.	.67 @	.68
ceresin, white	lb.	.16½ @	.18
carnauba	lb.	.47 @	.85
ozokerite, black	lb.	.60 @	.63
green	lb.	.75 @	.78
montan	lb.	.28 @	.30
substitute	lb.	None	
paraffine, refined 118/120 m. p. (cases)	lb.	.08½ @	
123/125 m. p. (cases)	lb.	.08¾ @	
128/130 m. p. (cases)	lb.	.09¾ @	

*Nominal.